

OPERATING INSTRUCTIONS.



model
328RB-1

HEAVY DUTY
HIGH SPEED
TWO NEEDLE
ANGULAR STITCHING
(SPLIT NEEDLE BAR)

DROP FEED, NEEDLE FEED
(COMPOUND FEED)

ALTERNATING PRESSER FEET
LOCKSTITCH MACHINE

CONSOLIDATED SEWING MACHINE CORP.

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CONSEW Model 328RB-1 I/A/W NSN 3530-01-182-2873,
complete with Stand & Motor Assembly, Spare Parts
Kit & Gage Set.

Power Requirement: 120VAC, 1 Phase, 60 Hz
Approx. size and weight: 20 X 40 X 41 High, 210lbs.

CAUTION
KEEP HANDS OFF MOVING PARTS. SHUT OFF POWER BEFORE MAKING ANY ADJUSTMENTS.

CAUTION
HIGH VOLTAGE 120VAC 60Hz 7amps

Setting up machine;

1. Read complete manual Prior to set up.
2. Attach the Bobbin Winder, Thread Stand, Knee Lifter and Head Rest Pin to Stand Assembly.
3. Insert machine head into stand cutout and Hinge Plates.
4. Install "V" Belt from machine handwheel to Motor Pulley.
5. Connect to Power Source.

Note: Be sure machine is well lubricated prior to sewing.

Authorized Service Activities

Consolidates Sewing Machine Corp is the exclusive distributor of all CONSEW Machines.

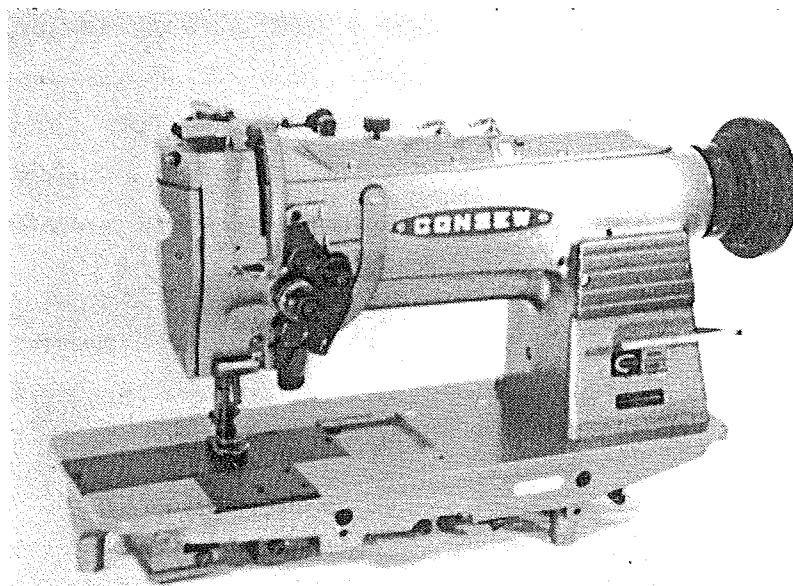
CONTACT: Consolidated Sewing Machine Corp.
56-65 Rust Street
Maspeth, N.Y. 11378
Phone: 718-894-7777
FAX: 718-894-1488
Telex: RCA 237750

For the name and address of your local authorized CONSEW service activity.

WARRANTY

Unless otherwise stated CONSEW sewing equipment is warranted against defects in material or workmanship for a period of ninety (90) days from date of invoice. A warrantee period of one (1) year applies to CONSEW clutch motors defective for same causes. Needle positioner motors are warranted for eighteen (18) months from date of manufacture.

OPERATING INSTRUCTIONS 328RB-1



CHARACTERISTICS AND CAPACITY

The CONSEW MODEL 328RB-1 is a double needle, split needle bar, heavy duty lockstitch machine, designed for sewing medium to heavy weight fabrics such as canvas, tents, sails, tarpaulins, upholstery and other similar products. Designed for sewing operations which require decorative or functional angular stitching such as collars, lapels, pockets, pocket flaps, etc. It is equipped with alternating pressers, compound feed and a rotary sewing hook on a vertical axis. It has a clearance of 11/32 inches under the presser foot.

Alternating pressers consist of a vibrating presser foot and a lifting presser foot working in combination. In operation, the pressers alternately press down on the material, the vibrating presser working in unison with the feed so that there is no slipping of the two or more plies of material which are being sewn.

SPECIFICATIONS

Speed, Max. (S.P.M.)	2200	Hook	16407
Clearance Under Foot	11/32" (8.5 mm)	Bed Size	7" x 20 3/8" (177 x 518 mm)
Needle Bar Stroke	1 1/4" (32 mm)	Work Space	10" (258 mm)
Stitch Length, Max.	4 s.p.i. (6.5 mm)	Stitch Type	301
Needle	135 x 7	Needle Distances	1/8" to 1" (3.2 to 25.4 mm)
Bobbin	Metal		
	Pre-wound	U	

LUBRICATION (Figs. 1 - 5)

For the lubrication of the machine, only a good quality sewing machine oil 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.

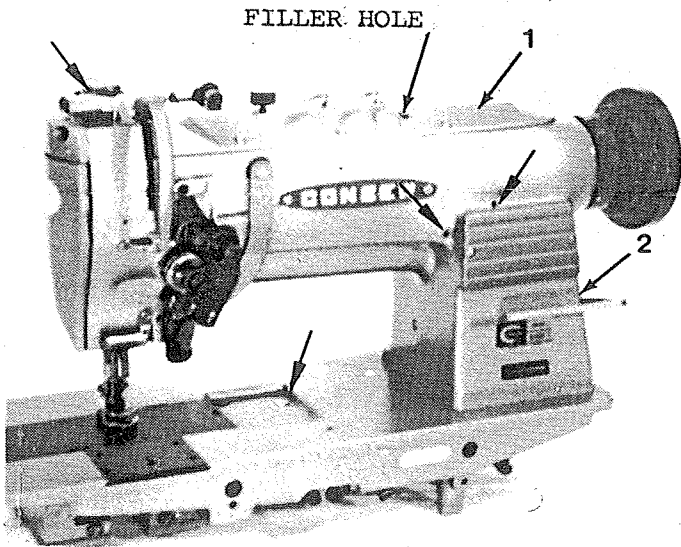


FIG. 1

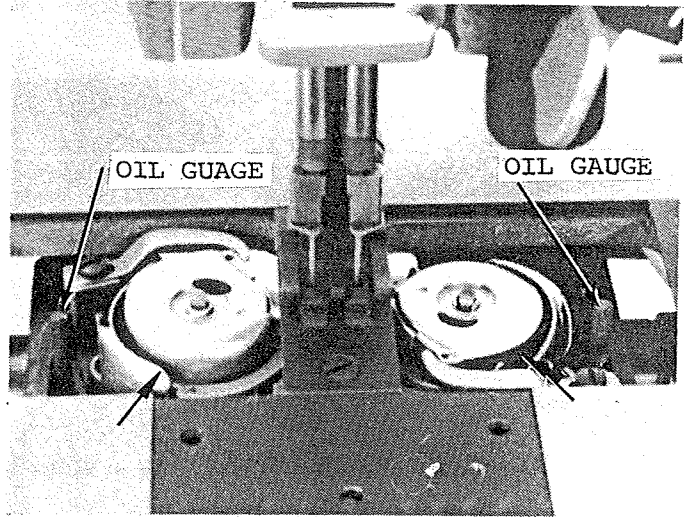


FIG. 2

Figure 1 shows the oil filler hole for oil reservoir on top of arm on machine. Fill machine arm reservoir to high mark on oil sight gauge as indicated in Fig. 1. The machine arm reservoir contains an oil vibrating pump which releases oil only when the machine is operating.

Figure 2 shows the oil filler hole for hook saddle reservoir. Remove oil gauges shown in Figure 2 and fill two hook saddle reservoirs to full mark on gauges. Lubricate hook gears and opener gears by applying a generous supply of oil to oil hole indicated in Figure 2 (left & Right Hook).

Figure 3 shows the machine with the oiling points when the face plate has been removed. These oiling points must be oiled in addition to all other oiling points before the machine is placed in operation for the first time and at least once daily thereafter.

Figure 4 shows the back of the machine with various oiling points.

Figure 5 shows the underside of the machine with the lubrication points.

Machine can be oiled when the machine is tilted back on its hinges.

NOTE: Oiling point holes are outlined in red.

OIL ADJUSTER (Fig. 5A)

Oiling to inside of arm top cover is automatically made by the vibration of the machine while sewing operation.

Stop oiling temporarily by the following method at your option in case of long sewing operation.

When point of the dial enters into point of arm bed cover after turning the dial, the dial goes down and oiling stops completely.

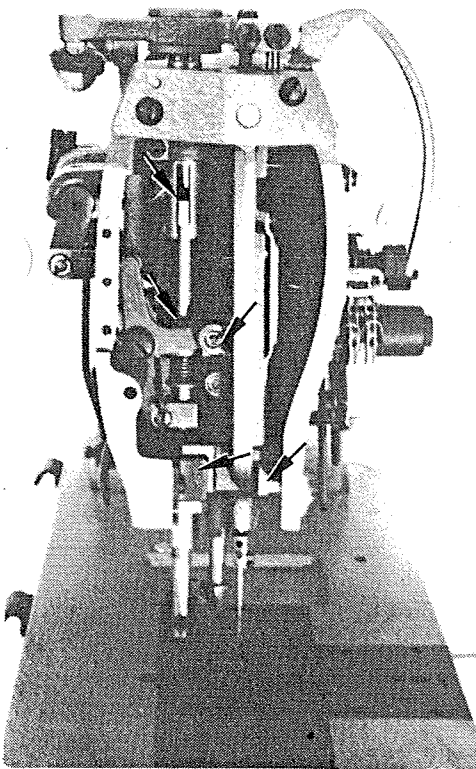


FIG. 3

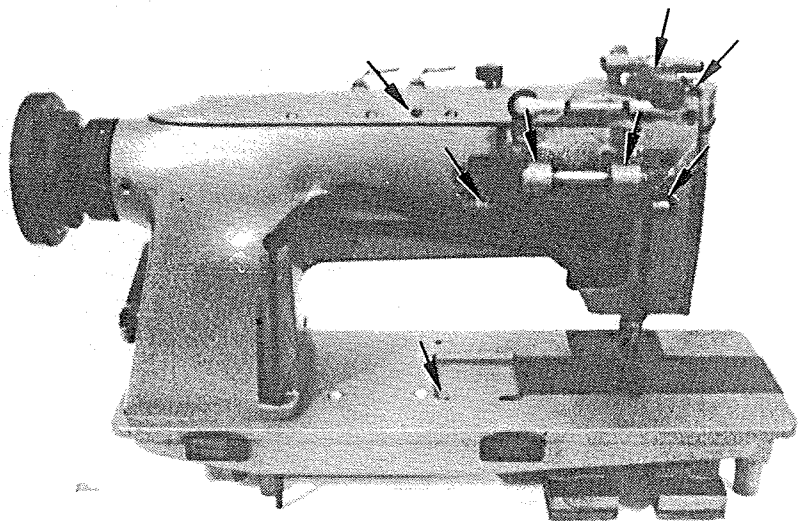


FIG. 4

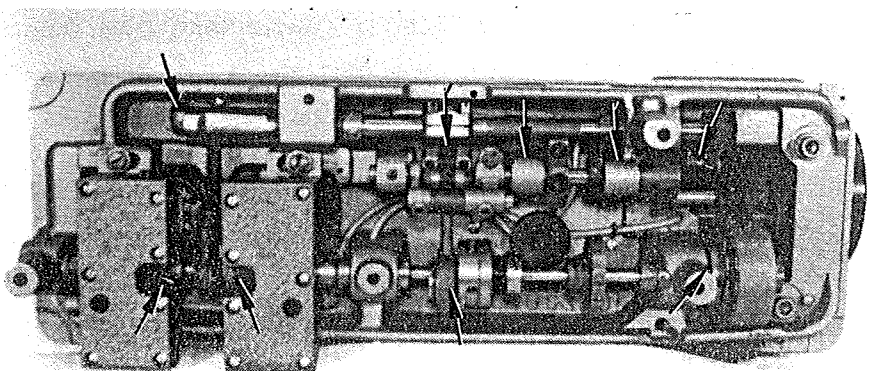


FIG. 5

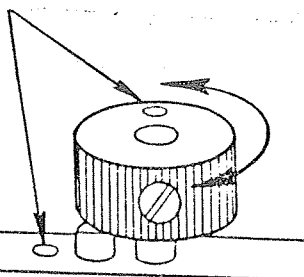


FIG. 5A

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 1, shown in Fig. 6.
- 2) Turn control valve screw shown in Fig. 6 clockwise for more oil; counter-clockwise 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.

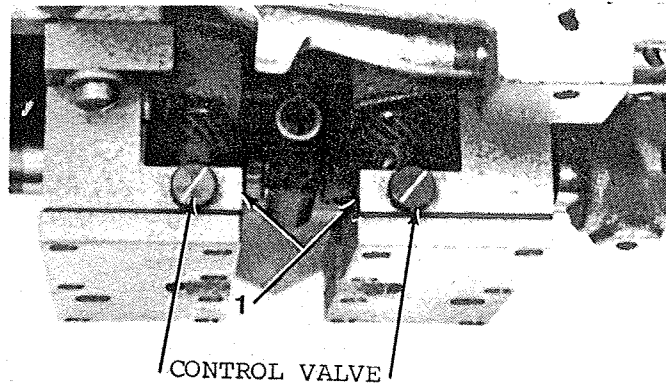


FIG. 6

SPEED

Maximum speed for machine is 2200 stitches per minute.

Maximum efficient speed is dependent upon the nature of the operation, the ability of the operator and the type of material being sewn.

NOTE: WARNING

Never run a new machine at maximum peak immediately following a new installation. A peak of 500 stitches per minute less than maximum is recommended for the first 100 hours of operation.

NEEDLES

Model 328RB-1 Series machine use standard needle style 135 x 7 in sizes 12 through 24. The size of the needle to be used should be determined by the size of the thread, which must pass freely through the eye of the needle.

SETTING THE NEEDLES (Fig. 7)

- 1) Turn machine pulley over toward you until needle bar is at highest position as shown in Fig. 7.
- 2) Loosen needle clamping screw.
- 3) Insert needle into needle bar to highest position, with long groove of needle to the inside, facing each other and eye of needle parallel to machine arm.
- 4) Tighten clamping screw.

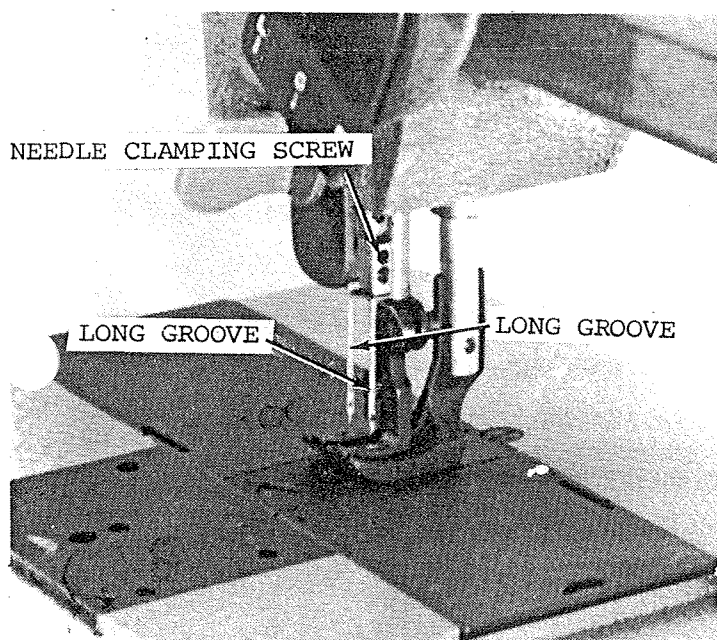


FIG. 7

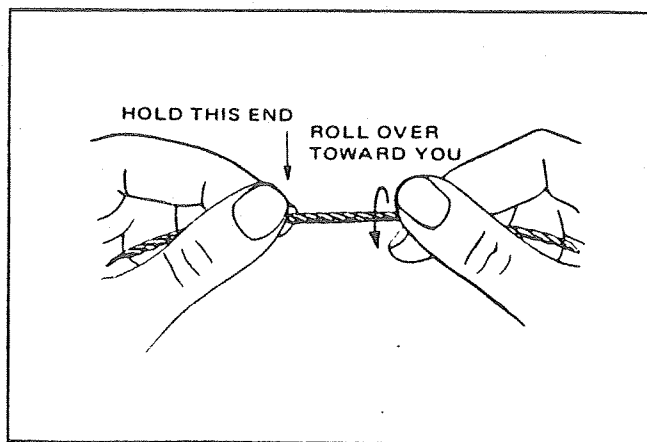


FIG. 8

THREAD (Fig. 8)

Left twist thread should be used in the right-hand needle, right twist thread should be used in the left-hand needle. Either left or right twist thread can be used in bobbin.

To determine thread twist, hold thread as shown in Fig. 8. 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.

BOBBIN WINDING (Fig. 9)

The bobbin winder is mounted on the table top with its pulley in front of the driving belt so that the pulley will separate from the belt after the bobbin has been wound with sufficient thread.

Push the bobbin on bobbin winder spindle as far as it will go. Pass thread from thread stand downward through eye (1), Fig. 9, in tension bracket; then between and around the back of the tension discs (2) bring thread forward toward bobbin (3) and wind from below in clockwise direction several times around bobbin. Push bobbin winder lever (4) downward until wheel (5) contacts the drive belt (6) and then start machine.

After bobbin is filled with thread, release will cause wheel to disengage from belt and winding will stop.

Cut thread and remove bobbin from winder spindle.

Adjustment screw (7) can be turned in or out to increase or decrease the amount of thread wound on the bobbin.

When fine thread is wound on bobbins, use light tension. It is regulated by turning the knurled nut (8) on the tension bracket at the rear of the bobbin winder. Bobbin can be wound while the machine is sewing.

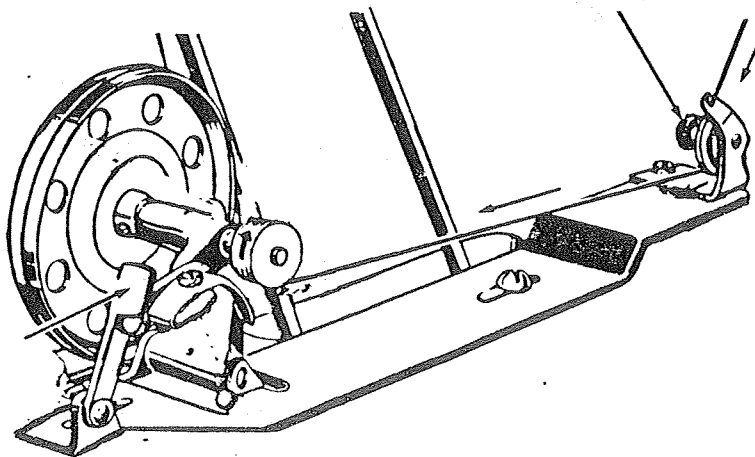


FIG. 9

INSERTING AND REMOVING BOBBINS (Fig. 10)

- 1) Raise both needle bars to their highest point and push open the two slide plates (1).
- 2) Pull up the latches (2) of the bobbin cases and lift the bobbins (3) out of the bobbin cases.
- 3) To insert a full bobbin in the bobbin case, hold it between thumb and index finger of your hand. Place the bobbin on the center post of the bobbin case and push down the latch (2).
Be sure that the thread draws out from the bobbin from left to right.
- 4) Pull the thread into the slot (4) and between the bobbin case opener (5) and the projection (6) and under the tension spring (7).
- 5) Draw out about 5mm of the thread on the needle plate and close the slide plate leaving a sufficient space for passage of the thread.

NOTE: See Fig. 43A and 43B for threading of bobbin case.

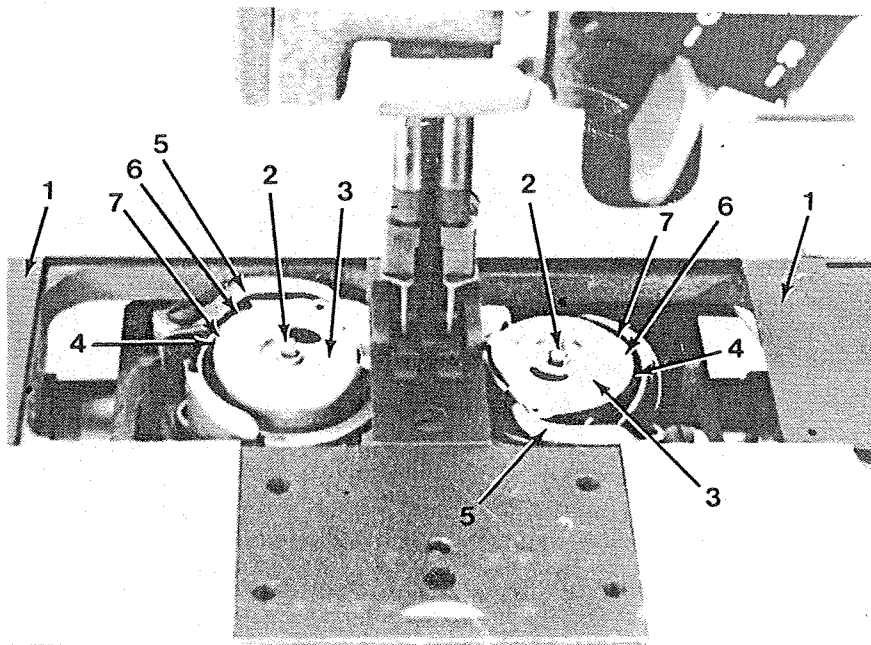


FIG.10

THREADING THE MACHINE (Fig. 11)

- 1) Raise both needle bars to their highest point.
- 2) From the thread stand, lead the thread to the thread guide (1), (A) on top of the machine, down to the upper guide hole of the thread guide (2), (B) from right to left.
- 3) Pass the thread in weaving fashion through the other two holes in (2), (B) and from right to left over and between the tension discs (3), (c).
- 4) Now pull the thread downward from right to left beneath and around thread controller (4), (D), continue to pull the thread upward through the fork in the thread controller and against the pressure of the check spring (5), (E) and through the thread guide (6), (F) pull the thread upward through the eye in the take-up lever (7), (G) down through the thread guide (6), (F) again and then through the thread guide _____ (9) (I) down through the hole (10), (J) in the needle holder and from inside to outside through the eye (11), (K) of the needle.

NOTE: Use numbers for left side, use letter for right side.

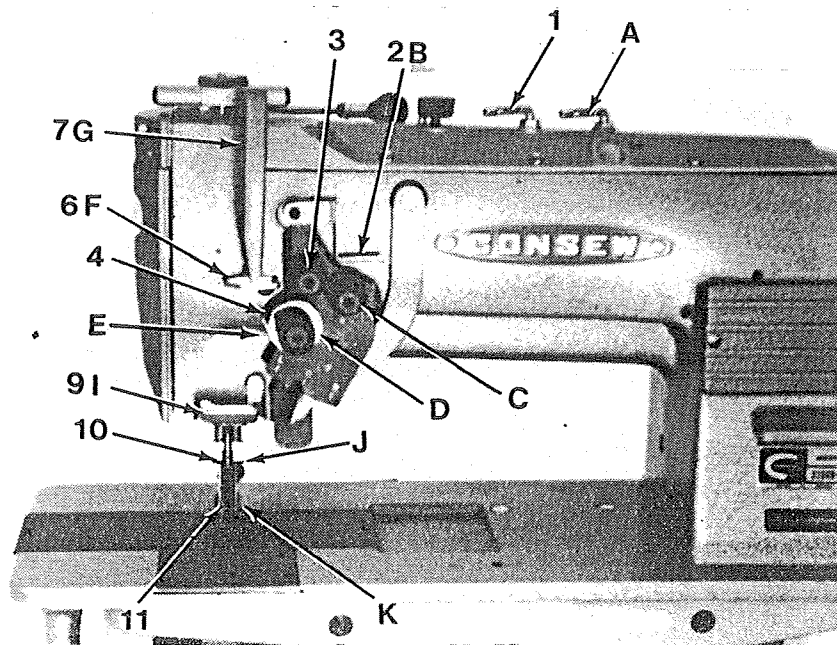


FIG. 11

REGULATING THE THREAD TENSIONS (Fig. 12)

For ordinary stitching, the tension of the upper and lower threads should be equal so as to lock both threads in the center of the fabric. If the tension on either thread is stronger than on the other, imperfect stitching will be the result.

If the tension on the upper thread is greater than that on the lower thread it will be straight along the upper surface of the fabric.

If the tension on the lower thread is greater than that on the upper thread, the lower thread will lie straight along the underside of the fabric.

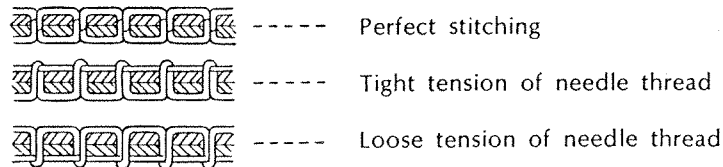


FIG. 12

A. Tension Of The Upper Thread (Fig. 13)

To adjust the tension of the upper (Needle) thread, turn the serrated nut (1) to the right for increasing tension. If you desire to decrease it, turn the nut to the left.

B. The Tension Of The Bobbin Thread (Fig. 14)

It is regulated by means of the tension screw (1). To increase the tension, turn the screw to the right, and to decrease it, turn the screw to the left with a screw driver.



FIG. 13

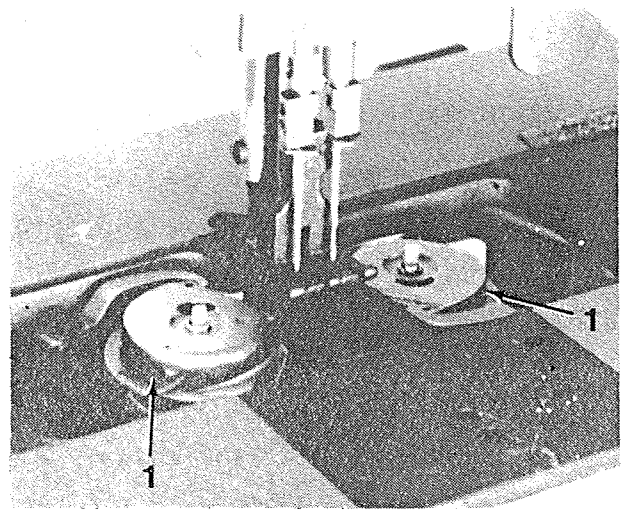


FIG. 14

THREAD CONTROLLER (Fig. 15) (See Page 19, Fig.35 Per Additional Information)

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. 15. Turn thread controller spring stop counter-clockwise 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. 15. Turn tension stud slightly counter-clockwise for more tension or clockwise for less tension. Tighten set screw B.

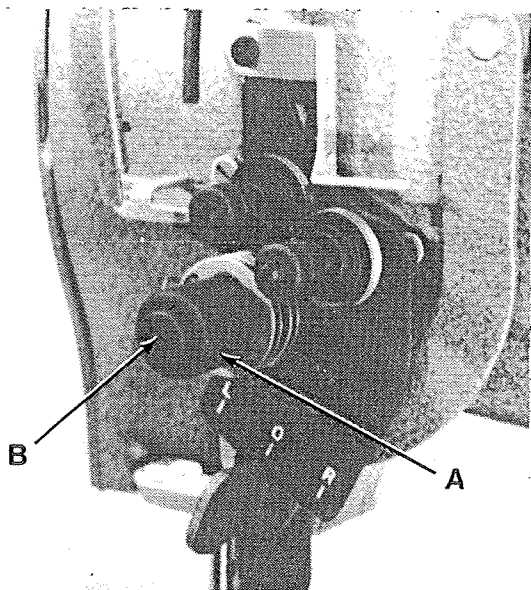


FIG. 15

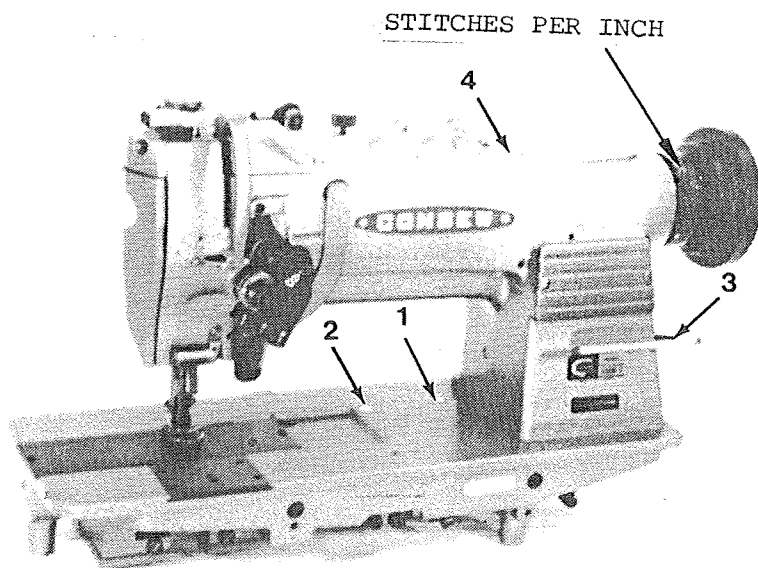


FIG. 16

ADJUSTING THE STITCH LENGTH (Fig. 16)

The stitch length is changed by pressing down button 2, Fig. 16, in the bed plate of the machine and by simultaneously turning the handwheel slowly toward you.

In due course, the button will snap into a notch in the feeding mechanism.

Hold the button down and continue to turn the handwheel, either forward or rearward, until the marking with the desired number of stitches on the hand wheel coincides with the reference mark on the arm. Then release the plunger.

PRESSURE ON MATERIAL (Fig. 17)

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

Pressure is regulated by screw (1) shown in Fig. 17 at rear of machine arm. Turn screw clockwise to increase pressure or counter-clockwise to decrease pressure.

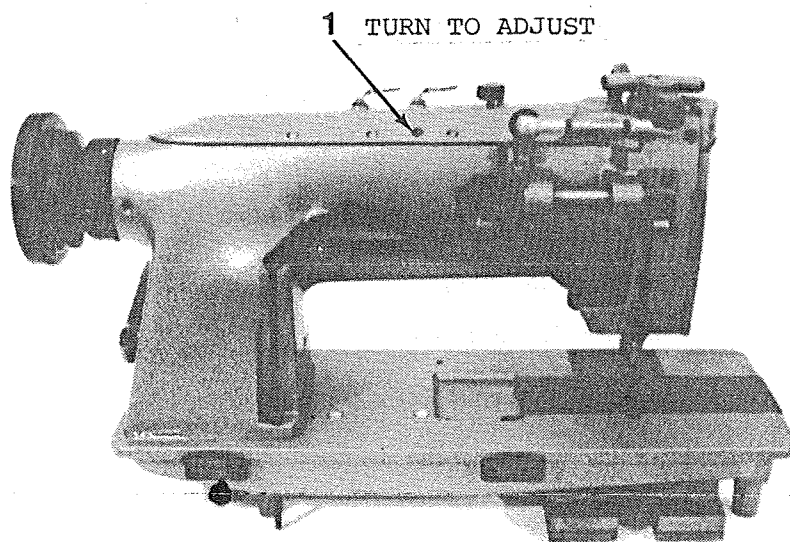


FIG. 17

REVERSE STITCH (Fig. 18, Fig. 19)

To do tacking for the purpose of locking the ends of seams, rapidly depress and release the lever (3) Fig. 18.

When reversing feed of the machine, keep the lever (3) depressed as long as required. For all other forward stitching, the lever remains in up position.



FIG. 18

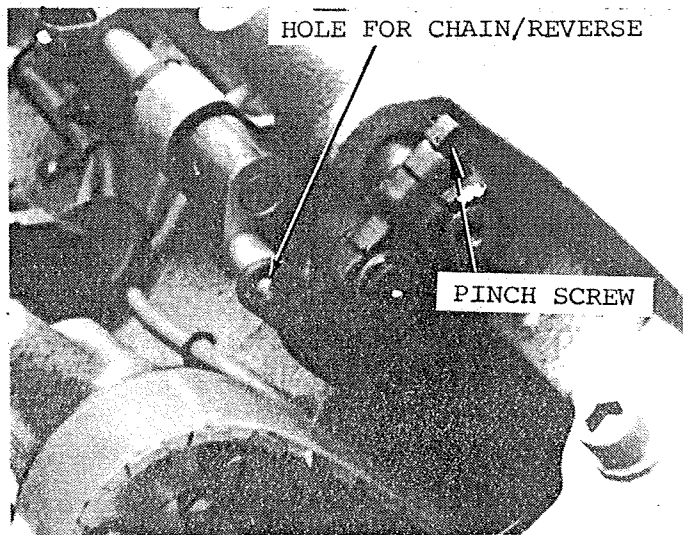


FIG. 19

To reverse the feed with foot treadle, the foot treadle chain should be connected to hole in reverse feed lever shown in Fig.19.

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

HOW TO RE-SET THE SAFETY CLUTCH MECHANISM (Fig. 16)

The sewing hook and it's mechanism are protected by a safety clutch. In case the hook gets jammed with thread or other foreign matter, the safety device disengages the driving belt, stops sewing, and thus prevents the machine from getting damaged. If it should become necessary to re-engage the safty clutch, depress the button (1) Fig. 16 in the bed plate, at the same time, turn the handwheel away from you until the locking mechanism re-engages the drive shaft beneath the bed of the machine, open the slide plate above the hook and rock handwheel back and forth to remove any foreign matter which may have lodged in the hook.

Do not use any sharp-edged tools, etc., lest the hook be damaged.

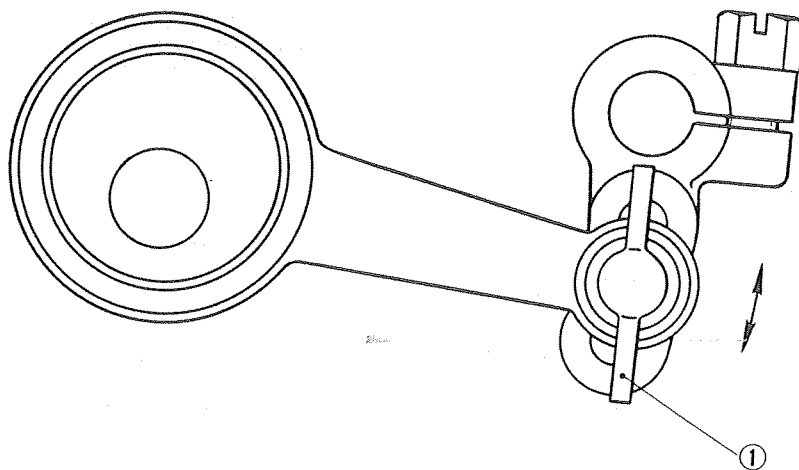


FIG. 20

ADJUSTING THE LIFT OF THE ALTERNATING PRESSER FEET (Fig. 20)

The thickness of the material sewn should control the height of the lift of the alternating presser feet. It should normally be just high enough for clearance of the material. With normal adjustment both feet lift to equal height.

To adjust the lift, loosen the wing nut (1), move up the nut to raise the lift and push down this nut to lower the lift.

When alternating the lift of the lifting presser foot unequally against that of the vibrating presser foot or vice versa, see the instructions "ADJUSTING THE HEIGHT OF THE PRESSER FEET".

REPLACEMENT OF THE TIMING BELT (Fig. 4, 21, 22, 23)

REMOVING THE TIMING BELT

Remove the arm top cover (4, Fig. 16) and remove the timing belt from the belt pulley, loosen the collar set screw (1, Fig. 23).

Loosen the two set screws (4, Fig. 23) for the hand pulley and remove the handwheel. Adjusting screw (5, Fig. 23), draw out the handwheel from the arm shaft.

Loosen the arm shaft rear bushing set screw (2, Fig. 23), pull out the rear bushing (3, Fig. 22) from the arm hole.

In case of the machine with reverse stitch mechanism, draw out the reverse lever (6, Fig. 23) with its shaft.

Removing or inserting the timing belt is made through the hole for the rear bushing.

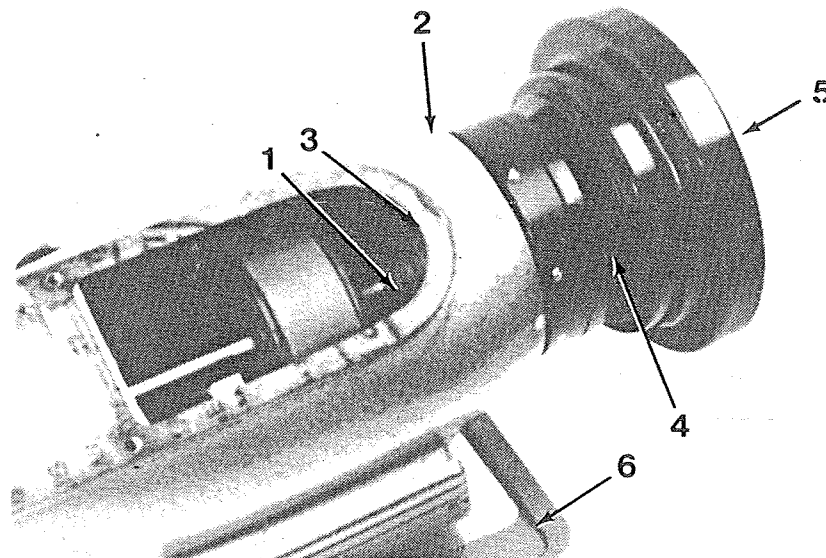


FIG. 23

INSERTING THE BELT (Fig. 21,22)

Turn the balance wheel toward you until the take-up lever gets to its highest point.

Turn the lower shaft (1) until the arrow mark on the lower shaft bearing collar (2) meets with another arrow mark on the timing plate (3).

Insert a new timing belt into the belt pulley at this position.

After inserting the belt correctly, replace the rear bushing, screws, the arm top cover, etc., to their original places. Finally, adjust the timing marks, as noted above.

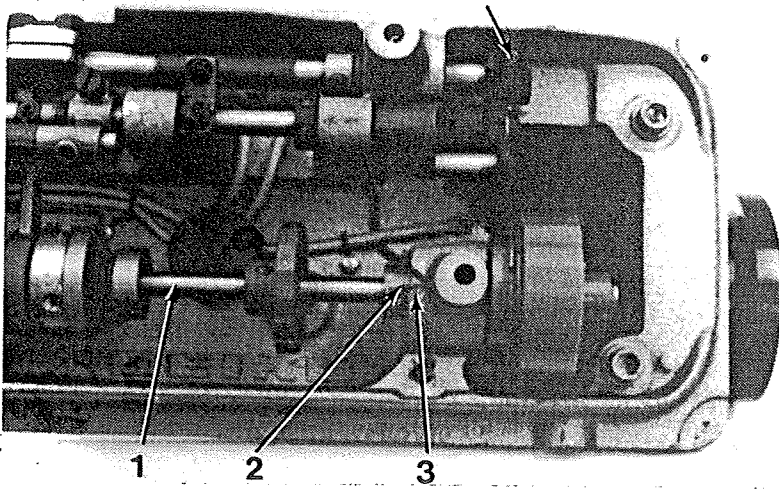


FIG. 21

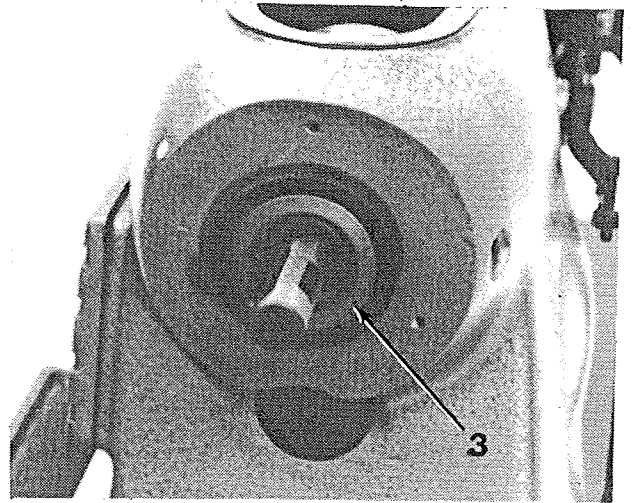


FIG. 22

ADJUSTING THE HEIGHT OF THE FEED DOG (Fig. 24, 25)

The maximum height of the feed dog from the surface of the needle plate is normally 1mm.

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. 24.

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. 25 and raise or lower feed dog to correct position. Re-tighten fork screw.

When adjusting feed dog, make certain it does not strike sewing hook.

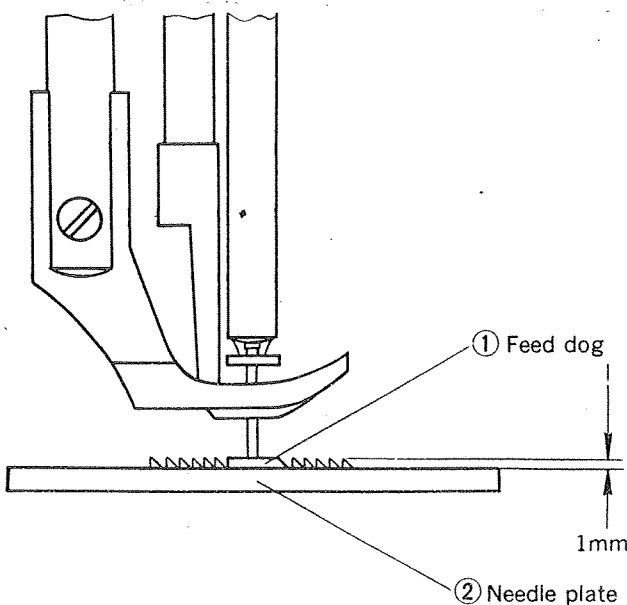


FIG. 24

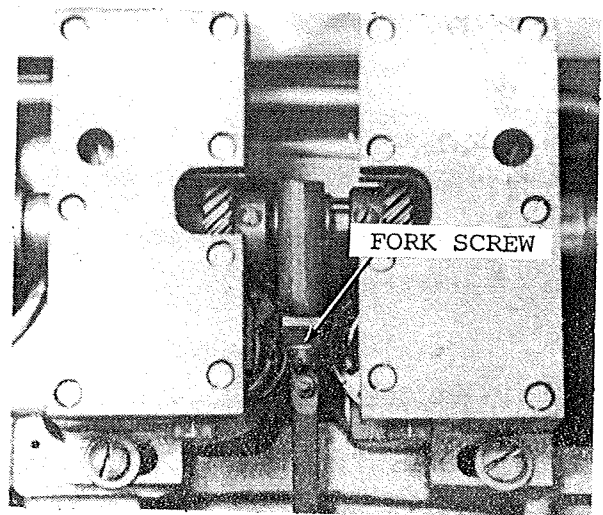


FIG. 25

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. 25 and adjust feed dog to correct position. Prior to above adjustment, check needle bar to presser bar setting.

ADJUSTING THE TIMING OF THE NEEDLE PLATE, NEEDLE & FEEDER (Fig. 26,27,36)

1) THE POSITION OF THE FEEDER AGAINST THE NEEDLE PLATE

Adjust the feed motion to the maximum and loosen the screw (4, Fig. 36). Set the position of the feeder so that both clearances A and B (Fig. 26) are equal before starting feed motion and after finishing the feed. Securely tighten the screw.

2) THE POSITION OF THE NEEDLE AND NEEDLE HOLE OF THE FEEDER

To adjust this, turn the handwheel to raise the needle bar to its highest point and put correct needles. Turning the handwheel to lower slowly the needle bar, check whether or not the needle descends to the center of the needle hole of the feeder. If the needle does not enter into the center of the hole, remove the side plate (2, Fig.1) and loosen the screw (1, Fig. 27) through the window of the arm. Holding the bottom of the needle bar rock frame (1 Fig. 28), move it as may be required to get the correct position to the center of the needle hole of the feeder. Then tighten the screw and replace the side plate.

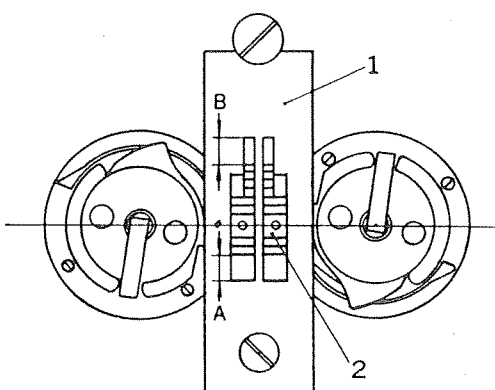


FIG. 26

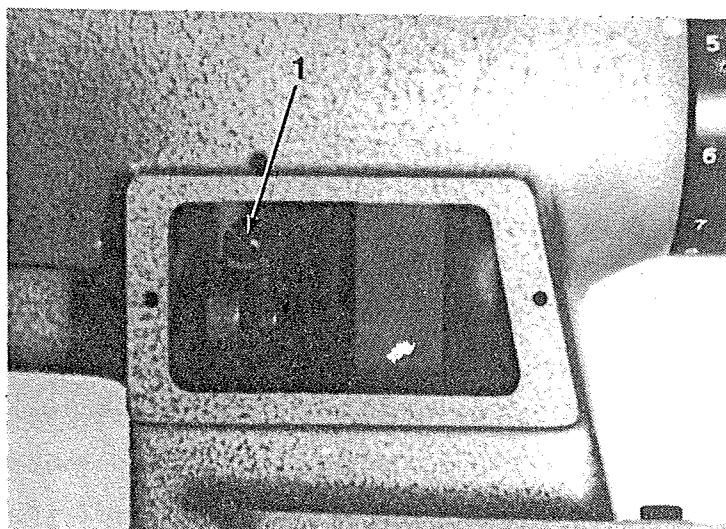
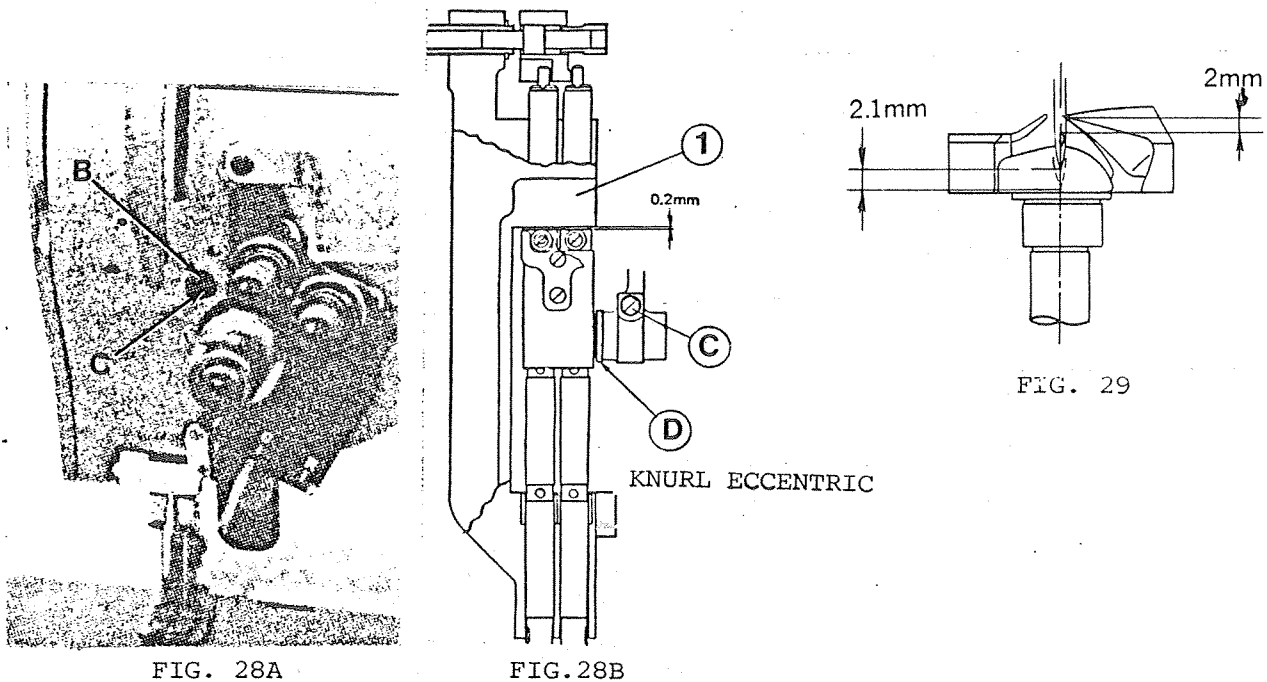


FIG. 27

ADJUSTING THE HEIGHT OF THE NEEDLE BAR (Fig. 28)

Caution: This procedure should only be performed by a qualified sewing machine mechanic. All others, refer to Page 27 Fig. 44 & 45.

When the needle bar is at its highest point, the distance between the surface of the needle plate and upper end of the needle eye should be $7/8$ " (22.5mm). To adjust, remove thread guide as shown. Insert screw drive into hole 'B', locate set screw 'C' and loosen. The entire needle bar assembly will now be able to move up and down on the knurled eccentric 'D' to move the eccentric, insert screw driver into hole 'B', push the knurl of the eccentric with the blade of the screw driver. After adjustment be sure to tighten set screw 'C'. (See Page 34 Fig. 52)



TIMING BETWEEN THE HOOK AND NEEDLE (Fig. 29)

After setting the needle bar height as noted on Pg. 2, set the stitch length to 0, turn the balance wheel to lower the needle bar to its lowest point, turn the wheel toward you. When the needle raises 2.1mm from the lowest point of its travel, normally the hook point is at the center of the needle, the measurement between the hook point and the upper end of the needle eye should be 2mm; further the clearance between the hook point and the needle hollow should be 0.05 to 0.2mm. If they are not measured as above, adjustments are made as follows:

TIMING ADJUSTMENTS (Fig. 30, 31)

Loosen the two set screws (1, Fig. 30), set the position of the large gear (2, Fig. 30) to the center of the small gear (7, Fig. 31) and tighten the two set screws securely.

Loosen the screw (6, Fig 31) on the small gear, move the hook and set the proper timing. Then tighten the screws securely.

Loosen the two set screws (1) Fig. 30, move the large drive gear (2) to right or left and set the proper timing. Then tighten the screws securely.

ADJUSTING THE CLEARANCE (Fig. 30, 31)

Loosen the set screw 3, and 4, move the hook saddle (5) to the right or left to get the correct clearance and tighten the screw. Be sure to use perfect needles.

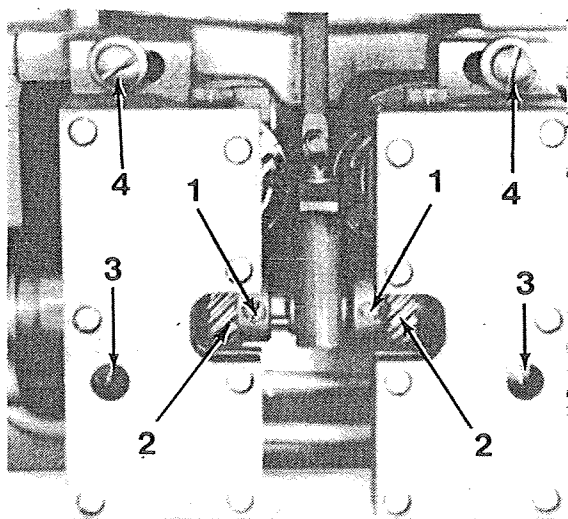


FIG. 30

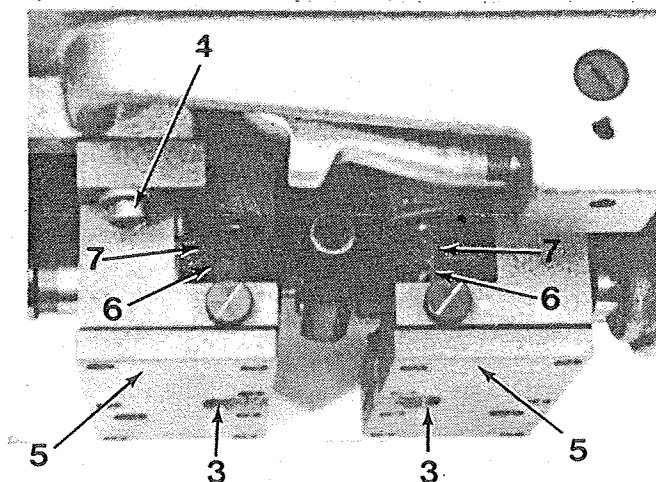


FIG. 31

RELATIVE POSITION BETWEEN BOBBIN CASE AND OPENER (Fig. 32)

- 1) Loosen the screw (1), turn the balance wheel until the opener (2) is located at the extreme right hand position of its travel.
- 2) In this position, adjust it so that the clearance between the inside edge of the opener and the tab on the bobbin case holder is about 0.2mm. After the adjustment, tighten the screw securely.

ADJUSTING THE HEIGHT OF THE PRESSER FEET (Fig. 17,33,34)

1) ADJUSTMENT BY THE PRESSER BAR LIFTER

Loosen the screw (1, Fig. 17), raise the presser bar lifter and loosen the set screw (1, Fig. 34)

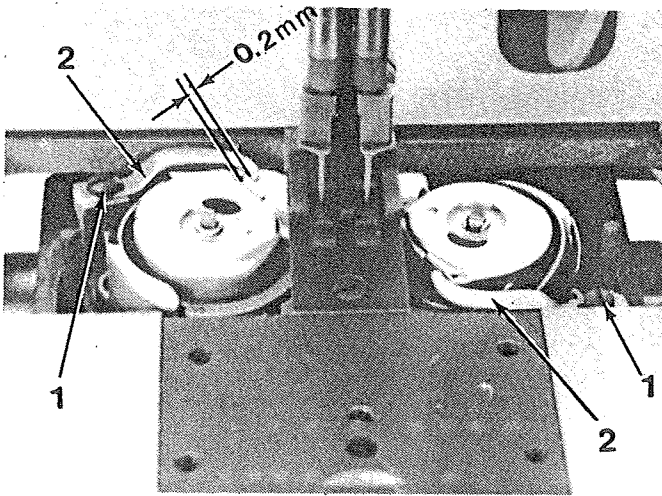


FIG. 32

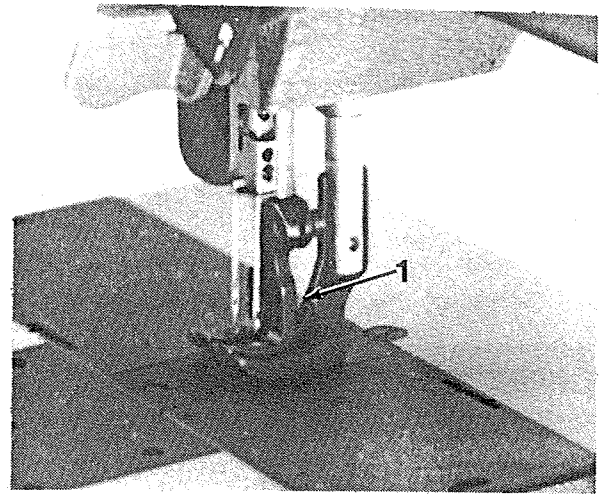


Fig. 33

Move the lifting presser foot up or down as may be required so as to get the correct height and tighten the screws securely.

2) ADJUSTING THE LIFT OF ALTERNATING PRESSER FEET

Descend the presser bar lifter, holding the vibrating presser foot (1, Fig. 33), loosen the hexagon screw (2, Fig. 34), move the presser foot up or down as may be required. Tighten the screw securely.

Normally, the momentum of the alternating presser feet is equal, but for piping work, it is effective to adjust less momentum of the vibrating presser foot against that of the lifting presser foot.

TIMING OF THE VIBRATING PRESSER FOOT (Fig. 34)

This is the normal timing when turning the balance wheel toward you, after lowering the presser bar lifter, the vibrating presser foot should reach the feeder earlier than the needle eye comes to, and when the needle raises, the vibrating presser foot should leave the feeder after the needle eye has left the feeder.

This is due to the reason that the vibrating presser foot must tightly hold the goods while the needle is passing the goods for avoiding irregular stitches.

To adjust this, set the lift of alternating presser feet to equal, loosen the screw (3, Fig. 34) and adjust the rotating position of the cam (4, Fig. 34) faster or slower as desired, tighten the screw.

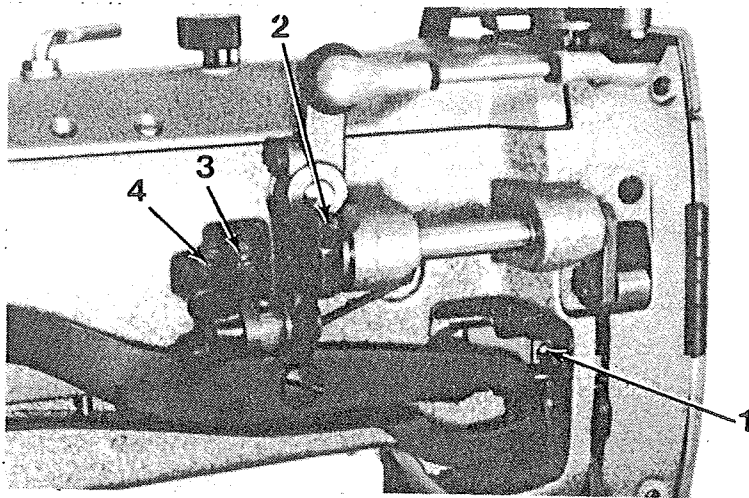


FIG. 34

THREAD CONTROLLER SPRINGS (Fig. 35)

There are two separate and individual thread controller springs -- one for each of the two upper (needle) threads -- installed in the machines.

When sewing angular seams with either one of the two needle bars stopped, upper thread is not drawn out at an equal rate for both needle bars.

Consequently, two thread controller springs are required to cope with this condition. These springs can be adjusted individually.

A) Adjusting the rear thread controller spring.

Loosen set screw (2), turn thread controller spring stop (3) to the right for more action; for less action turn stop (3) to the left and tighten set screw (2).

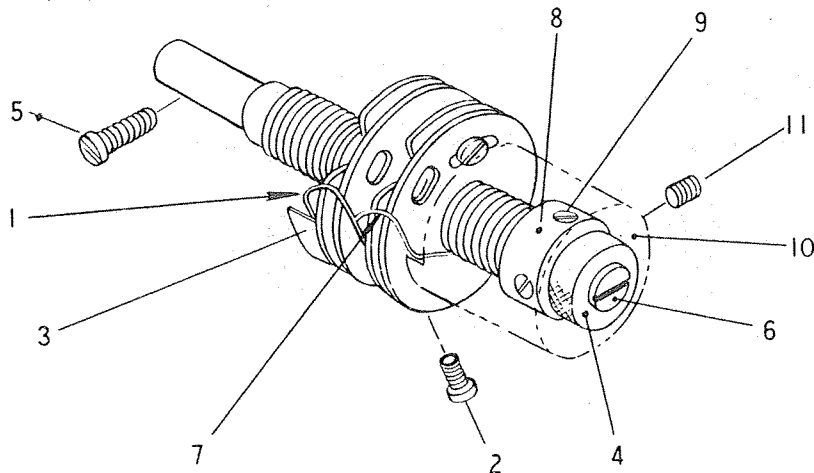


FIG. 35

B) Adjusting the front thread controller spring.

Loosen set screw (11) and turn spring stop (10) to the left to increase the action of thread take-up spring (7) and to the right to reduce the action of this spring. After the desired setting of the spring has been established, tighten set screw (11).

C) Adjusting take-up spring tension.

- 1) Slightly loosen nut (4) and also set screw (5).
- 2) To adjust the tension of the rear thread take-up spring (1) place a screw driver into the slot of the take-up spring slot (6) and turn to the left to tighten the spring tension and to the right to loosen same. After the desired tension has been determined, tighten set screw (5).
- 3) To adjust the tension of the front thread take-up spring (7) loosen two set screws (9) in collar (8) turning same to the left to tighten and to the right to loosen it. Upon determining the desired tension of this spring, tighten set screws (9) and also nut (4).

FINE ADJUSTMENT OF THE UPPER FEED (Fig. 36)

Ordinarily, the feeding momentum of the lower feed synchronizes with that of the upper feed. If, when the momentum does not synchronize, or increasing or decreasing that of the upper and needle feed according to the sewing conditions, the following adjustments are offered.

Loosen the nut (5) and bring (6), close to the feed driving rock shaft (7), for more feed momentum or keep away from for less momentum.

Tighten the nut firmly.

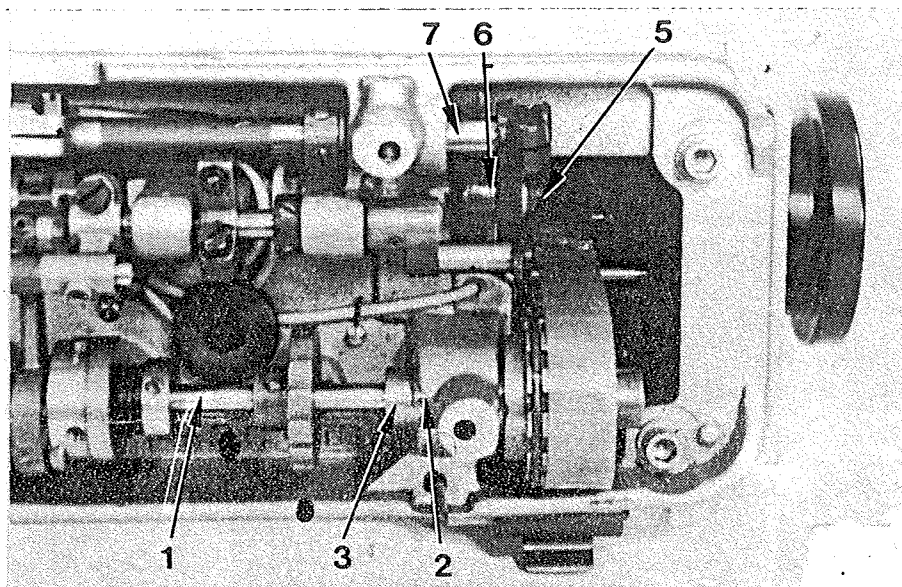


FIG. 36

SPECIAL INSTRUCTIONS FOR MODEL 328RB-1

Models 328RB-1 is specially designed as a two-needle angular seam sewing machine. Model 328RB-1 employs large-capacity bobbins. The machine is equipped with a device to prevent the presence of lower thread loops when sewing seams with acute (less than 90%) angles.

NEEDLE BAR STOP MECHANISM (Fig. 37)

Pushing the needle bar change over lever (1) Fig. 37 to either position "L" or "R" will selectively suspend the reciprocating movement of either one of the two individual needle bars.

Basically, there are two functions to this mechanism, one which causes the needle bars to operate and stop, and the other which switches from one needle bar to the other.

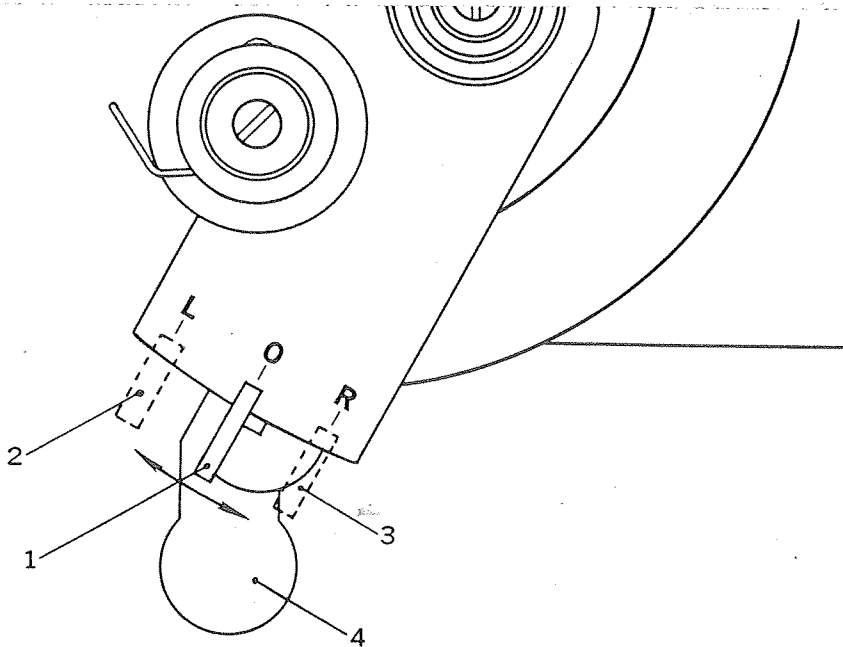


FIG. 37

NEEDLE BAR STOPPING AND OPERATING MECHANISM (Fig. 39, 40A 40B)

The two needle bars individually and jointly, with the components assembled to their insides, cooperate with the needle bar connecting stud (Fig. 39) to accomplish the stopping and the operation.

The positioning of the needle bar at their upper ends relative to the needle bar connecting stud is done by means of split stop rings (2) which are inserted into grooves (1) near the top ends of the needle bars, as well as with the set screws of the needle bar position guides.

At their opposite ends the needle bars are locked to the needle bar connecting stud by means of three special high-strength steel balls expanded by a mechanism inside the needle bars beyond the diameters of the bars. Consequently, when positioned as described above and as pictured on Fig. 39, the needle bars move up and down with the needle bar connecting stud and are, what may best be described as "operational".

The mechanism disposed within the needle bar is detailed on Fig. 40A which shows a needle bar in the operational state, while Fig. 40B shows a needle bar in stopped position. The force of spring (1) pushes plunger (2) and adjusting nut (3) against cone (4) which in turn forces three steel balls (5) outwardly beyond the diameter of the needle bar and against the countersink at the bottom end of the needle bar connecting stud (6). At the same time triangular prism (18) is allowing three steel balls (7) to recede below the diameter of the needle bar. Consequently, the movement of the needle bar connecting stud will cause the needle bar to reciprocate.

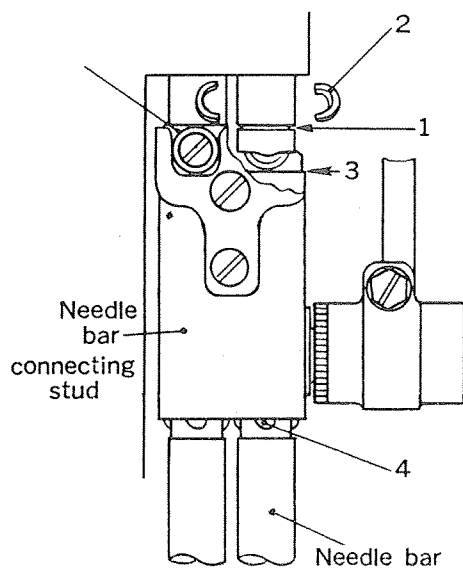


FIG. 39

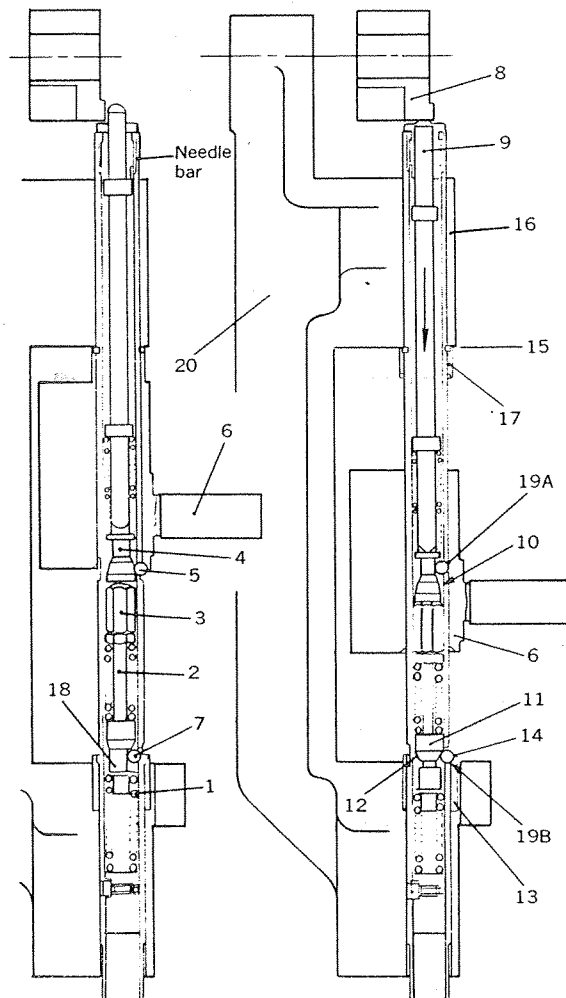


FIG. 40A

Operating mode

FIG. 40B

Non-operating mode

When stopping a needle bar by moving the change over lever (1) (Fig. 40B) into either the "L" or "R" positions, the mechanism locates needle bar selector block (8) Fig. 40B directly above the respective rod end (9). This rod end of the reciprocating needle bar now contacts the selector block causing the rod to move downward inside the needle bar causing cams (10 and 11) to likewise move downward. This allows upper balls (19A) to recede below the diameter of the needle bar while at the same time forcing lower balls (19B) outwardly beyond the diameter of the needle bars. Lower balls (19B) are now forced against the tapered mouth (14) of the needle bar bushing (13) and will stop the downward movement of the needle bar. While needle bar position guide (15) contacts the bottom of the upper end of the needle bar rock frame, thereby locking the needle bar tightly into place. At the same time the retracted upper balls (19A) do no longer lock the needle bar against the underside of the needle bar connecting stud (6) and so allow the latter to glide along the needle bar.

PREVENTION OF NEEDLE BAR ROTATION (Fig. 38)

Needle bar position guide (1) in conjunction with the bifurcated needle bar position bracket (3), attached to needle bar connecting stud (2) Fig. 38 in conjunction with needle bar position guide plate (4) keep the needle bar from rotating. In the operating mode, bracket (3) serves this purpose, while when a needle bar is stopped the channels embossed into the guide plate (4) prevent rotation.

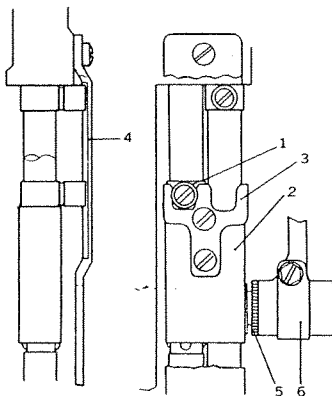


FIG. 38

VERTICAL ADJUSTMENT OF NEEDLE BAR POSITION

The exact vertical position of the needle bars is important for their trouble-free engagement and disengagement, respectively, since their positions are fixed within the needle bar rock frame (2) Fig. 40B. For the purpose of making the required fine adjustment of the needle bar position, and eccentric bushing (5) Fig. 38 is provided in needle bar connecting link (6).

NEEDLE BAR RELEASE MECHANISM (Fig. 37)

When the needle bar change over lever (1) Fig. 37 is set to either "L" or "R" position, the rod end (9) of the selected needle bar, when same is in its highest position, will contact the underside of selector block (8) causing said needle bar to become disengaged from its driving mechanism.

OPERATION OF THE NEEDLE BAR CHANGE OVER FRAME Fig. 37

Shifting the needle bar change over lever Fig. 37 to "R" will cause the needle bar change over frame to move in direction of the arrow Fig. 41A.

The needle bar change over frame connection, when the needle bar lowers and was disengaged, is fixed to their normal position as Fig.41B. At the same time, the needle bar stops when same reached in its next highest point.

When disengaging the needle bar stop pushing the lever release (4) Fig. 37 the needle bar change over frame and the needle bar change over frame connection return to their first position. Thereby, the slide block for needle stop separates from the needle bar stopping stud and returns to their first position.

Then, the needle bar connecting stud incorporates with the needle bar in its highest position and becomes normal twin needle operation.

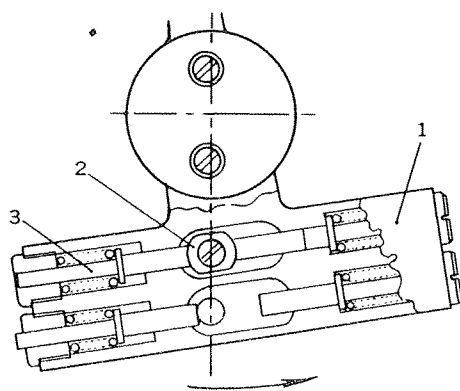


FIG. 41A

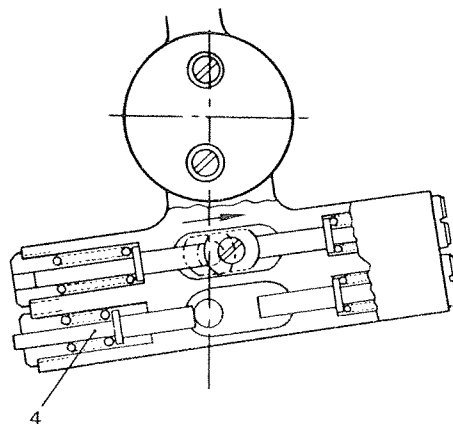


FIG. 41B

SPECIALLY DISIGNED ROTATING HOOKS FOR ANGULAR SEAM SEWING (Fig. 42)

The rotating hooks for model 328RB-1 has been developed specifically for these machines and are provided with specific clearances (1) Fig. 42 to allow the most effective transit of the sewing thread. Furthermore, the hook for model 328RB-1 with its larger bobbin provides for much increased thread volume.

Should the machine be stopped at that point of its stitching cycle when the upper (needle) thread is about to pass over the hook, the shape of thread guard (2) will allow unhampered passage of the thread.

The cap-type design of the bobbin case assures smooth thread handling. The horn-like extension (4) of the hook gib retains the upper thread temporarily taking up the slack, while it courses around the hook.

Thus looping is prevented, particularly when heavy threads or those lacking smoothness are employed.

Automatic lubrication of the moving parts of the hooks allows the maintenance of adequate sewing speeds without sacrificing their useful service life.

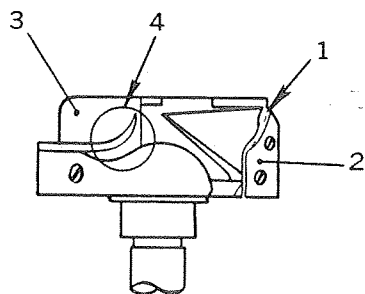


FIG. 42

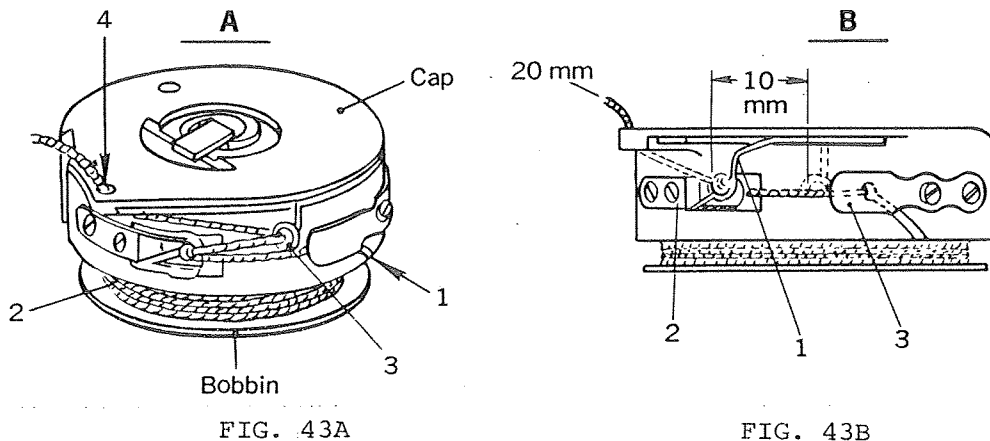
METHOD OF PREVENTING LOOPING OF THE LOWER (BOBBIN) THREAD (Fig. 43)

When sewing angular seams (particularly acute angles) with machines fitted with conventional types of rotary hooks, the appearance of large loops of the lower thread can be noticed at the underside of the work. This is caused by the transport of the material around the sewn corner, while the one raised needle bar is at rest.

The rotary hooks of model 328RB-1 is equipped with devices which prevent the looping of the lower thread by withdrawing by means of springs any excess of thread.

Fig. 43A shows the method of threading of the bobbin case of model 328RB-1. Fig. 43B shows the position of thread take-up spring (1) ready to pick up any excess of thread for the prevention of loops. Also note that the dotted outline of the thread take-up spring (1A) which shows same in a rest position prior to pulling back excess thread. As can be seen from this figure, spring (1) travels a distance to where its eye coincides with the thread guide hole in retainer (2).

When in this position, further demand for bobbin thread is then pulled out from under bobbin case tension spring (3). The function and effectiveness of spring (1) is such that slack thread loop containing as much as 20mm (25/32") of thread can be absorbed.



ADJUSTING THE HEIGHT OF THE NEEDLE CLAMPS (Fig. 44, 45)

- 1) Set stitch length to shortest stitch.
- 2) Turn handwheel until needle bar has descended to the lowest point of its travel.
- 3) Turn hook only so that hook point comes to the needle as (7) Fig. 44.
- 4) To correctly adjust the position of the needles (1) relative to hook points (2), remove the needle clamps (3) from their respective needle bars by removing needle clamp set screw (4). Upon removing the needle clamps, needle clamp adjusting screw (5) become accessible. Turn adjusting screw (5) either in or out to obtain the 4.4mm (11/64") distance between the eye of the needle when at its lowest position and the hook point Fig. 44 after the needle clamps with needles have been replaced on the needle bars.

Be sure that needle clamp adjusting screw (5) contacts the bottom of needle bar plug (6) and tighten needle clamp set screws (4).

- 5) Turn handwheel toward you allowing needles to rise. When the rotating hook point crosses the centerline of the rising needle, it should be 2mm (5/64") above the upper end of the eye of the needle. Adjust if necessary. (Fig. 45)

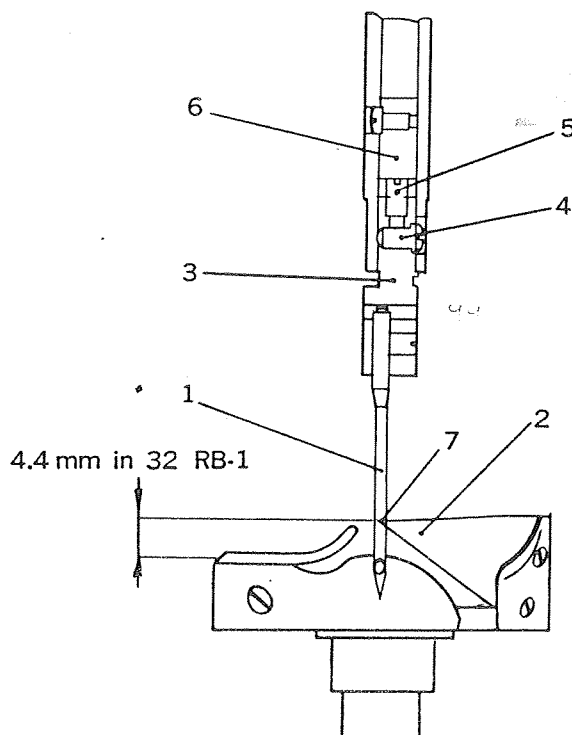


FIG. 44

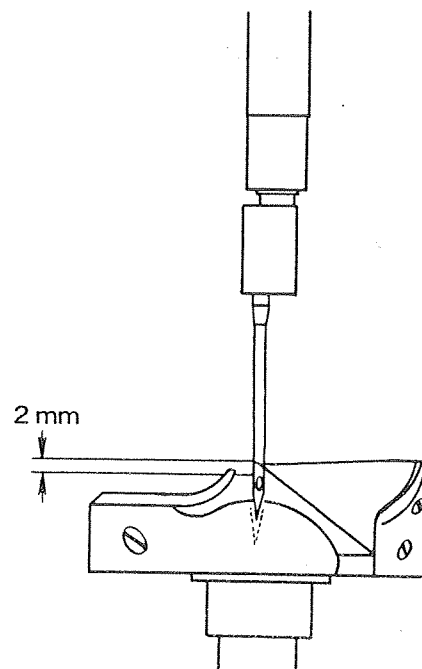


FIG. 45

TIMING ADJUSTMENT OF THE LOWER STEEL BALL (Fig. 46)

Turning the handwheel, confirm whether the needle bar motion is not smooth due to projection of the lower steel ball (2) Fig. 46 out of the outside diameter of the needle bar (3).

Normally, when the lever is changed over and the needle stop stud (1) is pushed, those parts in the needle bar begin to operate at the same time and the needle bar stops at its highest point.

Confirm in this position whether there is not an excess play on the needle bar in vertical direction.

This adjustment is made by the steel ball guide (4) and its nut (5), and the standard dimension is 30.5mm.

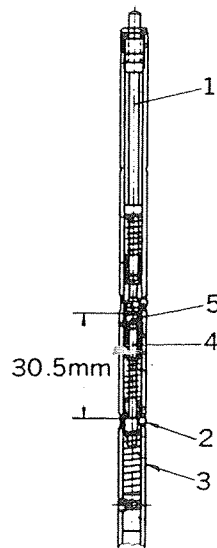


FIG. 46

SERVICE AND REPAIR INFORMATION

POSITIONING OF NEEDLE BAR BUSHING (Fig. 47)

When replacing the needle bar bushings (3) in the needle bar rock frame (2) careful attention must be paid to the depth to which these bushings are inserted into the frame. The correct and only position for these bushings is as follows:

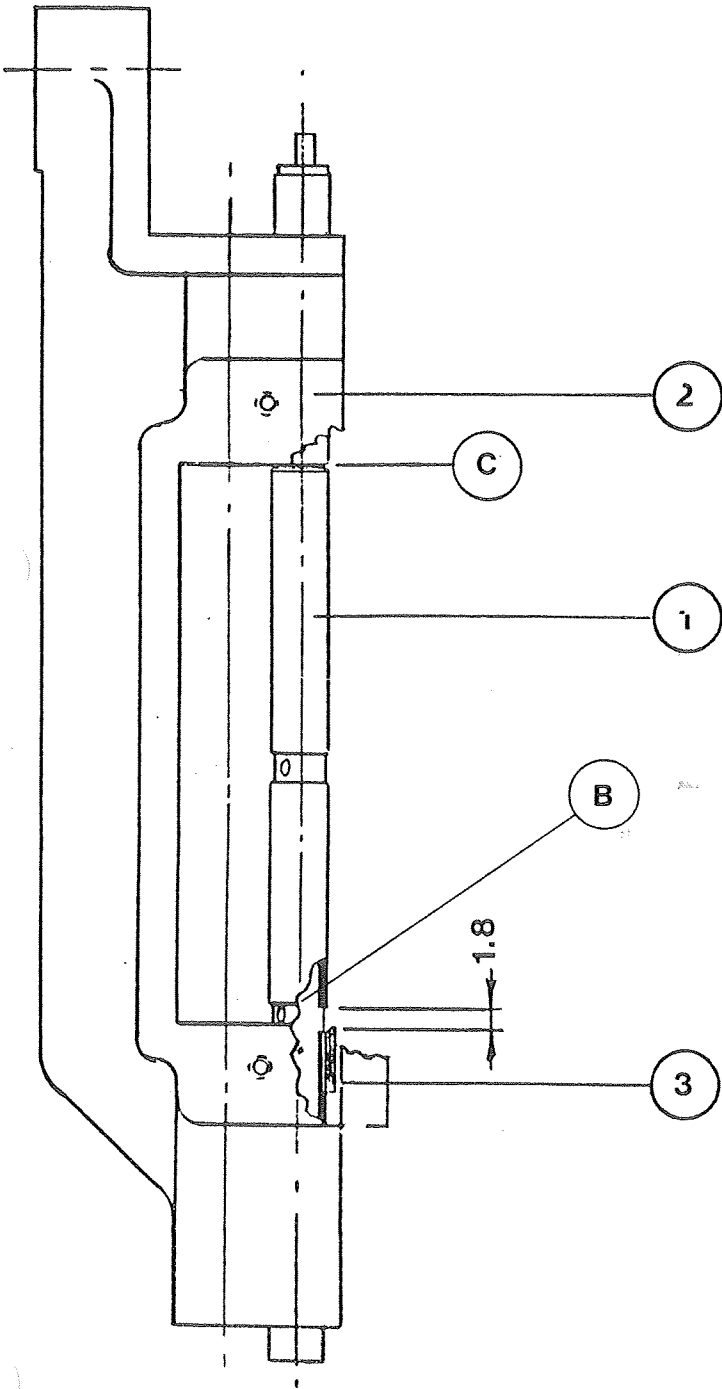


FIG. 47

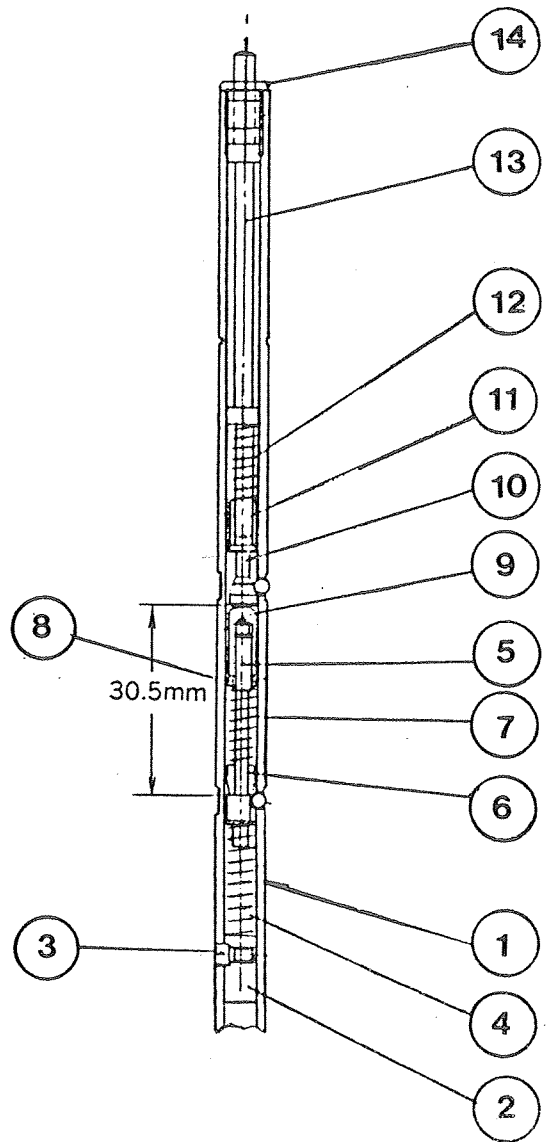


FIG. 48

With upper edge of the circular groove (c) in the needle bars (1) lined up flush with the inside surface of the needle bar rock frame (2), the distance between the top of the lower ball holes (B) in the needle bar and the top of the bushings must be 1.8mm (0.071").

CAUTION: When inserting bushings into needle bar rock frame, make certain that they rest squarely on the surface surrounding the bore in the frame before pressing them into place.

ASSEMBLY OF COMPONENTS TO NEEDLE BARS (Fig. 48)

The assembly of the various components inside of the needle bars should be done following these steps:

- a) Insert plug (2), with threaded cross hole up, into bottom end of needle bar (1). Be sure to line up threaded cross hole with cross hole in needle bar and insert screw (3) tightening it fully.
- b) Drop spring (4) into top hole in needle bar.
- c) Drop ball guide (6) with its tapered end facing down onto ball guide stud (5) then insert ball stud spring (7) followed by lock nut (8) and cap nut (9) - long. Adjust nut (9) so that the distance between the upper end of the triangular facet on stud (5) and upper ball-shaped end of nut (9) becomes 30.5mm (1.201"). Check this dimension carefully and, after establishing its accuracy, tighten locknut (8). Now drop this sub-assembly with nuts up into the bore in the needle bar.

NOTE: Since this adjustment cannot be changed after the sub-assembly is dropped into the needle bar, make absolutely sure that the adjustment measures exactly as specified.

- d) In the order enumerated now drop into the bore in the needle bar these parts: Ball guide (10) with its taper facing up, collar (11), spring (12) and rod (13) with its thin end entering the hole in the needle bar first. Now place cap screw (14) into end of needle bar and tighten.
- e) Depress extending end of rod (13) at least three times to ascertain that the assembled parts move freely and easily.

ASSEMBLY OF NEEDLE BARS IN NEEDLE BAR ROCK FRAME (Fig. 49)

- a) From the bottom end of the needle bar rock frame (12) insert into the left bore the completed needle bar (1) placing into the space between the upper and lower bearings of the frame the needle bar connecting stud (3) and the needle bar position guide (4).
- b) Place three steel balls (A) into the lower three holes of needle bar (1) pushing the needle bar downward into the lower needle bar bearing

in frame (2) until the balls have moved out of sight.

- c) Hold needle bar in position as outlined under (b) and insert three steel balls (B) into the upper three holes in the needle bar. Push needle bar control rod (5) to allow the three balls to recede into their holes and maintain control rod in this position. Now slide downward along the needle bar (1) the needle bar connecting stud (3) to a position where same conceals the three balls (B).

NOTE: To prevent the balls (A) and (B) from falling out of their respective holes while manipulating the needle bar, it is recommended to put a dab of stiff grease (wheel bearing grease or similar) into each hole.

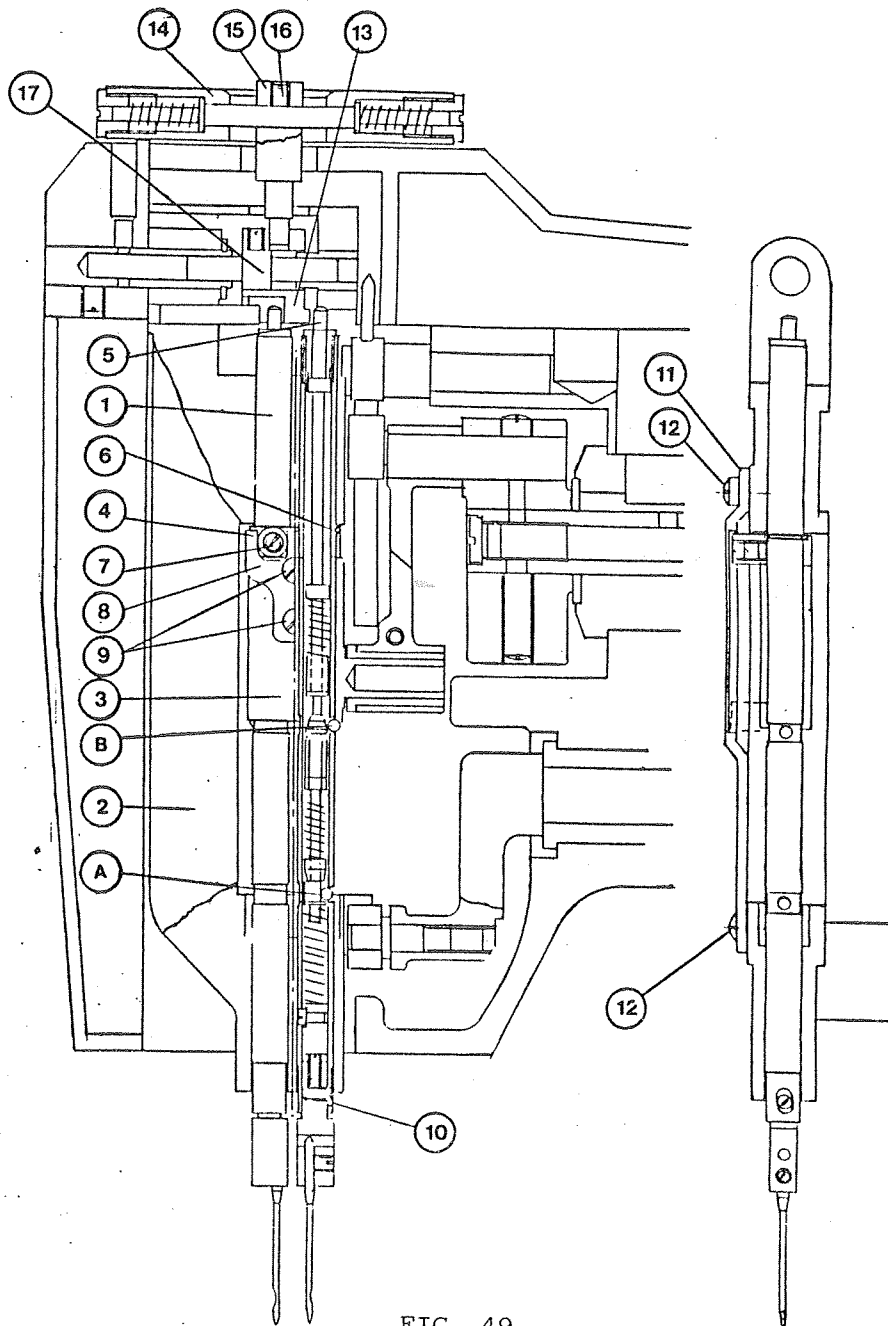


FIG. 49

- d) Insert the split retaining ring (6) for the needle bar guide into the groove on the needle bar (1) and slide upward the needle bar position guide (4) until the retaining ring (6) enters the recess in the needle bar position guide. Now allow needle bar connecting stud (3) to slide upward until it contacts needle bar position guide (4). At this moment steel balls (B) should be retained by the countersink surrounding the bore in the needle bar connecting stud. Provisionally tighten set screw (7).
- e) Move needle bar (1) in needle bar frame (2) to ascertain that the three steel balls (A) recede below the surface of the needle bar and that it moves freely in the frame. Now depress needle bar stop rod (5) as far as possible. This will cause the lower steel balls (A) to project from the surface of the needle bar and will cause it to be stopped at the highest point of its travel. When the needle bar is thus locked in its highest position, check that there is a slight clearance of the needle bar within its confines. Also make sure that the needle bar connecting stud moves freely along the needle bar.

Should it be determined that there is excessive or insufficient clearance when checked as outlined in the preceding paragraph, the following adjustments must be made. For reference consult paragraph 2, (c).

When clearance is too great, slightly reduce the 30.5mm dimension indicated in paragraph 2, (c) for the ball guide stud assembly. When clearance is insufficient, increase this dimension. In this connection it may be worthwhile noting that each full turn of nuts (8) and (9) - see paragraph 2, (c) - increases (or decreases) the length of the ball guide stud assembly by 0.4mm (0.016). Partial turns, of course, change the length proportionately.

- f) Install second needle bar (1) in right bore of needle bar rock frame employing same sequence outlined above.
- g) To needle bar connecting stud (3) attach needle bar position guide bracket (8) employing screws (9) and placing the projection of needle bar position guide (4) within the forked end of bracket (8).
- h) Loosen set screws (7) and turn needle so that the needle clamp fastening screws (10) face to the left and right respectively.
- i) Install needle bar position guide plate (11) using screws (12) making sure that both needle bars move freely and easily.

POSITIONING THE NEEDLE BAR ROCK FRAME PIN (Fig. 50)

The position of the needle bar rock frame pin (2) in needle bar rock frame (1) must be accurately set to assure trouble-free operation of the needle bar disengaging mechanism. Referring to Fig. 4 it can be seen that pin (2) must be 0.5mm (0.20") distant from rod end (3) of the nearest needle bar.

INSTALLATION OF NEEDLE BAR ROCK FRAME BRACKET (Fig. 51)

- a) Push needle bar rock frame hinge pin (6) into needle bar rock frame bracket (5) until the closed end of the pin is approximately flush with outside surface of the bracket. Place needle bar rock frame (1) onto hinge (6) and insert E-ring (7) into groove at free end of pin (6) check for free movement of needle bar rock frame about pin with minimum of end play.
- b) Place needle bar rock frame and bracket assembly on machine making sure that all connecting parts are properly mated. Turn hand wheel causing needle bars to move up and down. Insert into their places

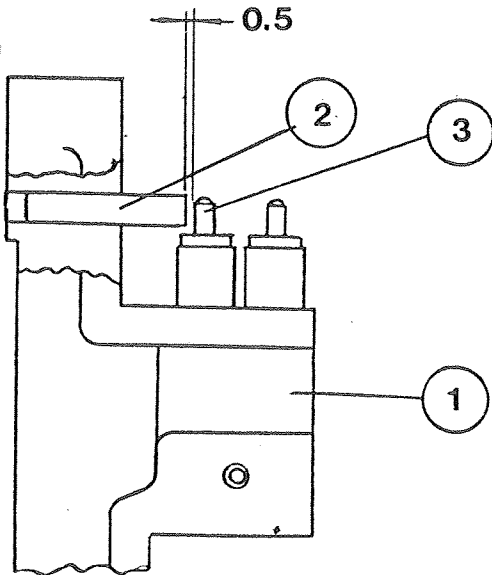


FIG. 50

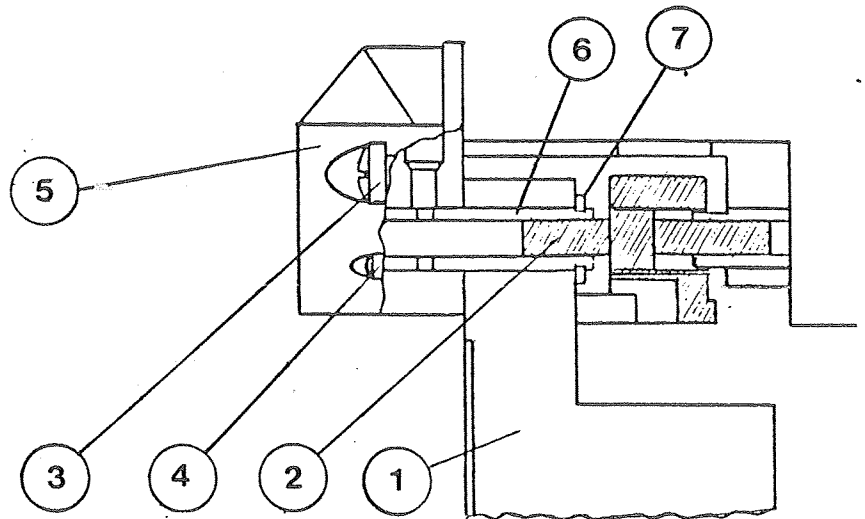


FIG. 51

the two needle bar rock shaft brackets screws (3) tightening them gradually and gently, all the while checking that the needle bars move up and down smoothly. Finally, set screws (3) tight and, if required, drill into the head the two holes for pins (4) using a 3.5mm (.138") drill. Set pins in place to lock assembly.

ADJUSTING THE HEIGHT OF THE NEEDLE BARS (Fig. 52)

Turn handwheel to raise needle bars to their highest point. In this position there must be a clearance of 0.2mm (0.008") between the needle bar position guide (2) and the adjacent underside of the needle bar rock frame (3). To adjust clearance loosen clamp screw (1) and turn knurled rim (4) of the eccentric bushing; then lock clamp screw securely.

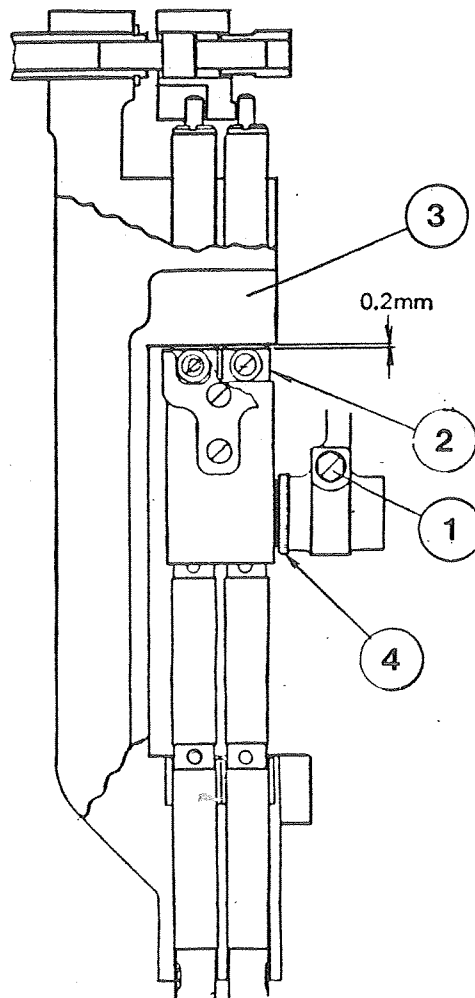


FIG. 52

ADJUSTMENT OF THE NEEDLE BAR RELEASE MECHANISM (Fig. 53, 54).

- a) Assemble left and right plungers (1) with their springs and cap screws (9) with needle bar release bracket (2), shown partly sectioned. There should be 5mm (0.197") space between the ends of the two plungers. If this space should be greater, use a 6.5mm (size "F") drill and carefully and equally deepen the plunger holes to obtain the specified distance between the ends of the two plungers.

- b) If the distance between the end of the plungers should be less than the specified 5mm, shorten plungers (1) by carefully grinding their respective large diameter ends.
- c) The needle bar change-over frame pin (3) is driven into the arm casting and must project above same 21mm (0.826") as shown in Fig. 54 below.
- d) Position the eccentric collar (4) so that the axis (x-x) is at a right angle to the surface of the face plate of the machine and tighten its set screw to provide 1mm (0.040") clearance between the underside of the needle bar change-over frame (6) and the arm top cover (5) Fig. 54.

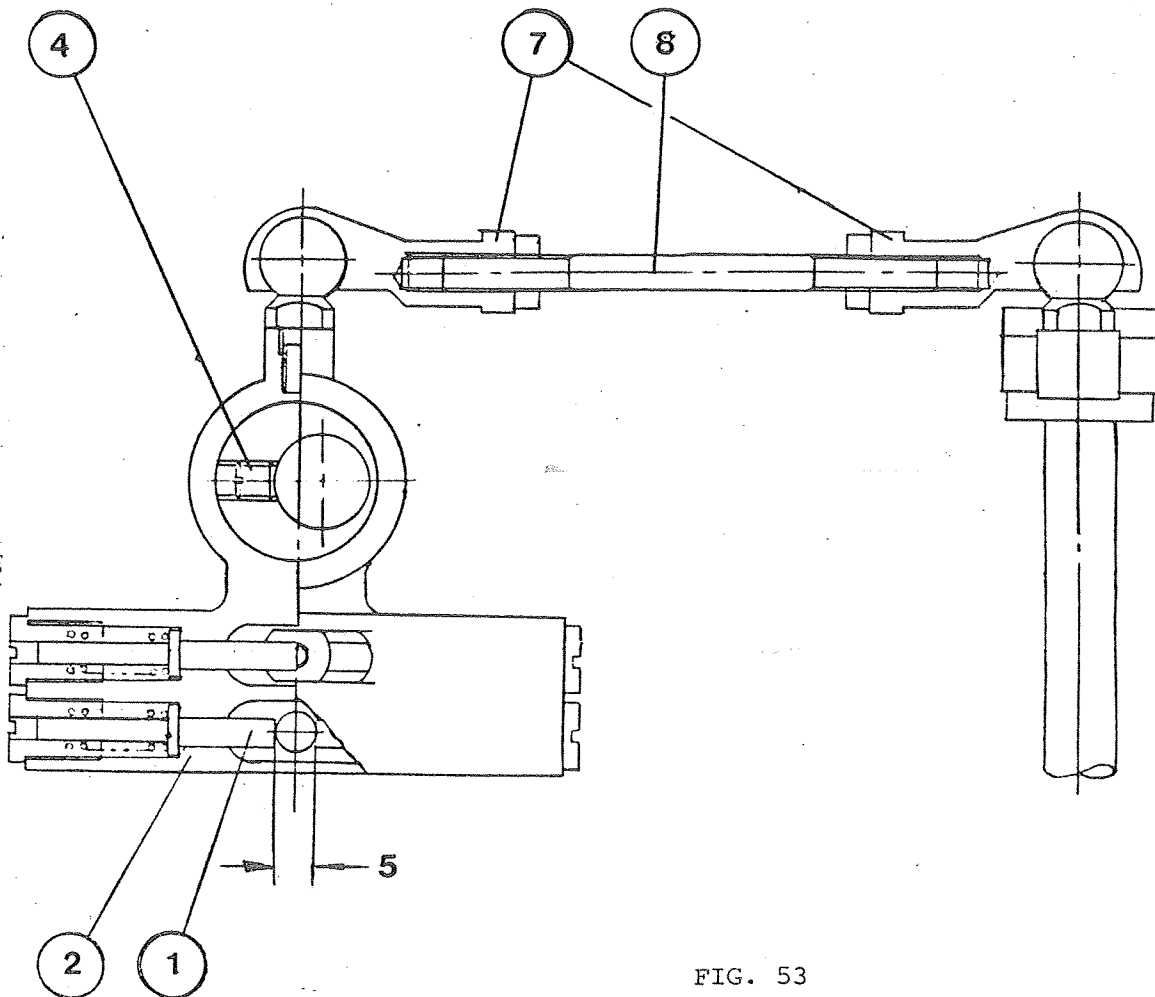


FIG. 53

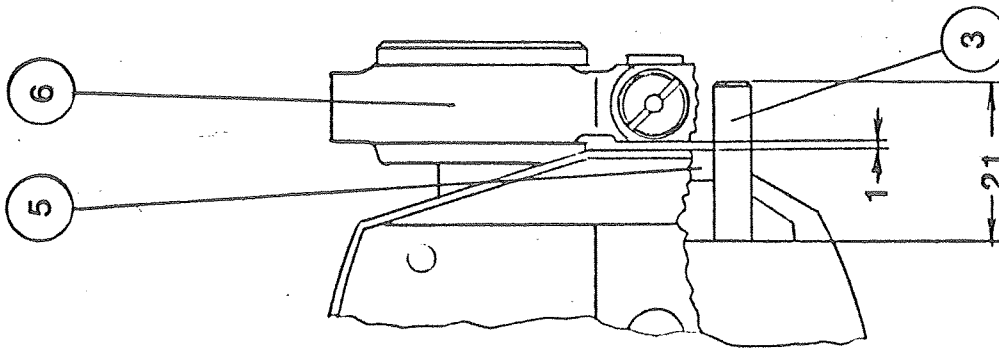


FIG. 54

ADJUSTMENT OF THE NEEDLE BAR SELECTOR (Fig. 49)

- a) The needle bar selector block (13) Fig. 49 is locked to sliding shaft (17). The latter is coaxial with the needle bar rock frame. Place this block so that the gap at its underside is to the left and that when the needle bars are in their highest position, rod ends (5) are completely clear of the selector block. When in this position tighten set screw in selector block.
- b) Manually move needle bar change-over frame (14) fig. 49 to the left and to the right to determine that there is clearance with the opposite rod ends (5) - the right end when in left position and vice-versa. When checking the movement of needle bar change-over frame (14) make sure that connecting stud (15) assumes a central position. If not, loosen its set screw (16) move the connecting stud into a central position and tighten set screw.

ADJUSTING THE LINE UP OF THE NEEDLE BAR SELECTOR LEVER (Fig. 55)

- a) Press selector lever release (1) Fig. 55 to ascertain that position of selector lever (3) coincides with marking "O" on selector lever bracket (2).
- b) In the event that the selector lever is out of position, adjust to correct setting by adjusting the length of ball-jointed connecting rod (7) and (8). If selector lever in its neutral ("O") position should be off its mark toward "L", shorten the connecting rod. If the selector lever should be off in direction of "R", lengthen connecting rod.

NOTE: Since connecting rod (8) has right hand threads at both ends, its length can only be adjusted after one of the ball studs has been removed from the part into which it is inserted. For greatest convenience, unscrew the ball stud inserted into the needle bar change-over frame (6) Fig. 54.

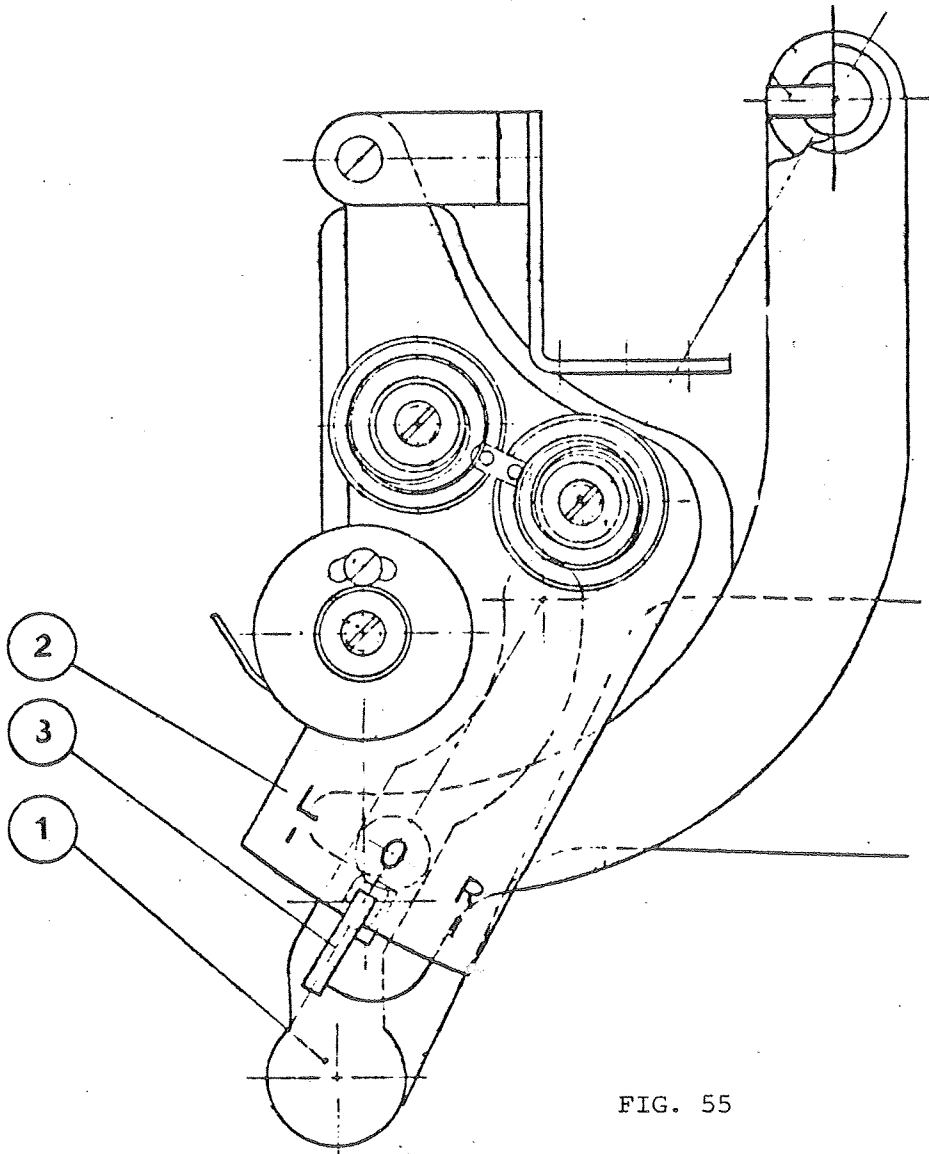


FIG. 55

SETTING THE HEIGHT OF THE NEEDLE CHUCKS (Fig. 56A, 56B)

- a) Adjust stitch length to shortest stitch. Turn handwheel until needle bars reach lowest point of their travel.
- b) Loosen set screws of both rotating hooks so that they will turn freely in their gears. Turn hooks until their hook points (2) are at the center lines of needles (1) - Fig. 56A. In this setting the distance between both hook points (2) and the upper end of both needles' eyes should be 4.1 mm (0.161").
- c) If adjustment should be necessary, turn regulating screw (5) to obtain required distance making sure that the head of screw (5) contacts the surface of needle bar plug (6).
- d) Loosen hook set screw again, turn handwheel of machine until needle bars reach lowest point of their travel and begin to rise; continue turning handwheel until hook points pass center lines of needles 2 mm (0.078") above the upper end of the needles' eyes. Securely tighten set screw in hook gears.

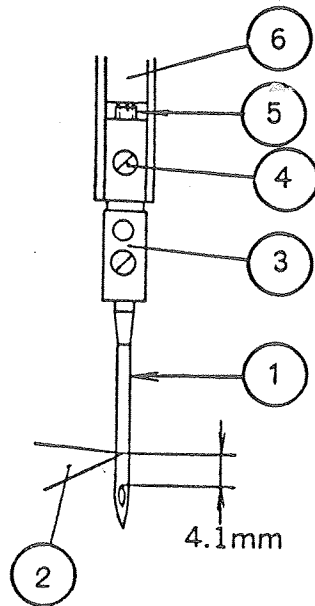


FIG. 56A

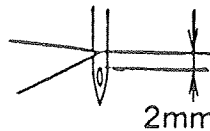


FIG. 56B

TROUBLE SHOOTING

GENERAL

This section contains trouble-shooting information which can be of help in determining and removing the causes of trouble that may develop in the machine. When the troubles covered by this section develop, they can be conveniently tracked down and readily corrected by consulting the following tabulation:

Specific Troubles

A) Needle Breakage.

- (1) Needle is loose in clamp, tighten clamp screw.
- (2) Needle of incorrect class and variety is being used; compare needle with one of correct type.
- (3) Presserfoot is loose or out of line, straighten and tighten it.
- (4) Needle is too light for the fabric, select the correct needle.
- (5) Operator is pulling on fabric, DO NOT assist machine in feeding material.

B) Needle-Thread Breakage.

- (1) Thread is too heavy for the needle. Insert thicker needle.
- (2) Right-twist thread is being used. ONLY LEFT twist thread must be employed (Page 5, Fig. 8).
- (3) Damp or defective thread is being used, use dry, smooth thread.
- (4) Machine is incorrectly threaded; follow threading diagram on page 8 (Fig. 11).
- (5) Needle is incorrectly set, set the needle with the short groove closest to loop taker.
- (6) Upper tension is too tight; adjust for correct stitch balance. (Page 9, Fig. 13)
- (7) Thread take-up spring is out of adjustment.
- (8) There is a sharp edge on the rotating look taker bobbin case, or tension controller; smooth with finest emery cloth and polish with Rouge cloth.
- (9) Needle is rubbing against presserfoot, adjust and tighten the foot.
- (10) Needle is defective, blunted, or bent at the point, use a good needle.

Trouble Shooting Cont'd

C) Bobbin-Thread Breakage.

- (1) Defective or damp thread is being used, use dry thread of correct size.
- (2) Bobbin tension is too tight, adjust according page 9, Fig. 14.
- (3) Bobbin case is incorrectly threaded; see page 26, Fig. 43.
- (4) Bobbin is wound too full to revolve freely, take off thread down to the rim of the bobbin, and adjust the bobbin winder according to instructions on page 6.
- (5) Rounds of thread on the bobbin are lapped over one another; unwind bobbin manually and rewind evenly and uniformly.
- (6) Bobbin case is sticky with gummy oil and lint, clean the bobbin case and rotating loop taker with kerosene or Naphta and lubricate rotating loop taker with few drops of oil.
- (7) There is a sharp edge on the rotating loop taker, bobbin case, bobbin, or needle, smooth with finest emery cloth and polish with Rouge cloth.

D) Skipping - The needle thread fails to catch the bobbin thread, the machine will not sew or will leave skips in the stitches. To remedy this trouble, time the needle with the needle bar according to instruction.

E) Drawing of seam - The threads draw or pucker the seam, adjust the tensions according to instruction on page 9.

F) Stitches uneven or piled up - The stitches pile up on one place; adjust the stitch regulator for longer stitch. Also, if indicated, the presser foot on the material should be increased (Page 11, Fig. 17).

G) Feed dog striking throat plate - If the feed dog strikes the throat plate, adjust the feed dog to rise above throat plate no further than the depth of the feed dog teeth. (Page 14)

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