104-200

PRELIMINARY

SERVICE

MANUAL

No safeguard, safety applicance, or device attached to or forming an integral part of this machine shall be removed or made ineffective except for the purpose of making immediate repairs or adjustments.

Any such safeguard, safety appliance, or device removed or made ineffective during the repair or adjustment of such machine shall be replaced immediately upon completion of such repair or adjustment.

No machine shall be operated until such repairs or adjustments have been made and the machine is in good working condition.

Safety glasses should be worn when operating the machine.

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"Precision and Quality Since 1881"

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Made in U.S.A.

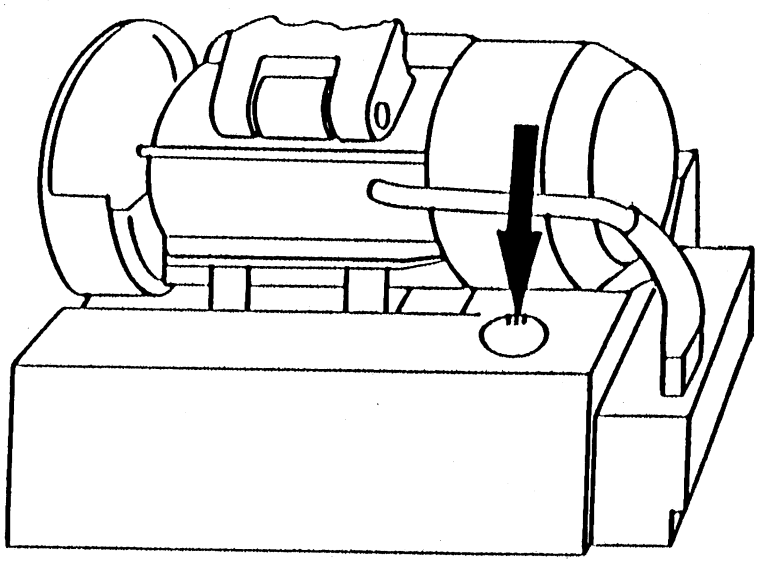
CAUTION

CHECK THE LINE VOLTAGE BEFORE OPERATION

FACTORY SETTING IS 220 V

FOR DIFFERENT RATED LINE VOLTAGE, RESET THE TAP BY TURNING THE VOLTAGE SELECTOR.

NOTE THAT INCORRECT SETTING OF THE VOLTAGE SELECTOR SWITCH CAN CAUSE MALFUNCTION



INTRODUCTION

The Series 104/200 sewing machine is driven by an A.C. Servo motor. This type of motor is a clutchless electronic brake motor. It provides for quick stopping of the bedplate and the sewing function of the machine.

The A.C. Servo unit is slaved to a master operation computer, housed in the control box mounted on the table. This computer monitors the complete cycle of the machine, constantly checking to see if the next operation can be performed before it is allowed to take place. If a problem is found in the electronics, a flashing number is displayed on the front panel of the control box. A complete set of status lights is also found on the front panel of the control box. These lights provide current machine status information to the operator.

Features found on the 104/200 include:

An oil monitor that shuts off the start sew switch when the oil reservoir is empty.

An upper thread monitor which monitors the thread after the first few stitches occur; this allows thread tension to take place without shutting down the sewing cycle.

A choice of slow start or fast start of sewing.

An eye speed control switch which allows normal sewing speed in the eye, a stepdown of 100 spm in the eye, and a stepdown of 200 spm in the eye.

A sew/no sew feature is included in the machine to allow for the cycling of the machine without sewing.

Two safety features incorporated into the machine are:

The ability to shut off power to the drive systems of the machine while still maintaining power to the input sensors and switches. This allows sensor checking and adjusting without the need to power down the machine.

The emergency stop function of the machine is quite intensive. The computer monitors the machine and keeps track of where in the cycle emergency stop was entered. To exit emergency stop, certain machine position checks have to be met.

The functions of bedplate drive, stitch starting point and stitch stopping point are electronically monitored by the computer. Proximity sensors are used to determine the various change of function points that take place during the cycling of the machine, and the computer compares this information to the front panel switch settings and responds accordingly.

OPERATING CYCLE

UNDERSTANDING HOW A MACHINE WORKS

Diagnosing problems in a Reece Series 104-200 buttonhole sewing machine requires an understanding of how it functions. If the principle and construction of the machine is understood, then it's a matter of reasoning to determine the cause of trouble and to what it can be attributed. It is very important to note the time in the cycle when the trouble is occurring and whether it is of a constant or random nature. If it is occurring at definite periods, one should always try to determine the possible cause before starting to adjust something which needs no adjusting. Whether the trouble is periodic or constant, it is always advisable to study the time and order in which the various units function. A functional knowledge of the machine will help point to the source of trouble, but it also will be of assistance when making a systematic hunt by a process of elimination.

An excellent rule well worth keeping in mind is "Never disturb an adjustment without knowledge of the effect the change will produce and how to restore the mechanism to its original setting".

ESSENTIALS

There are two essentials that underlie a buttonhole machine. One is the cycle of operation over the buttonhole pattern, and the other is stitching around the pattern. Before a buttonhole machine will run, these two essentials must function.

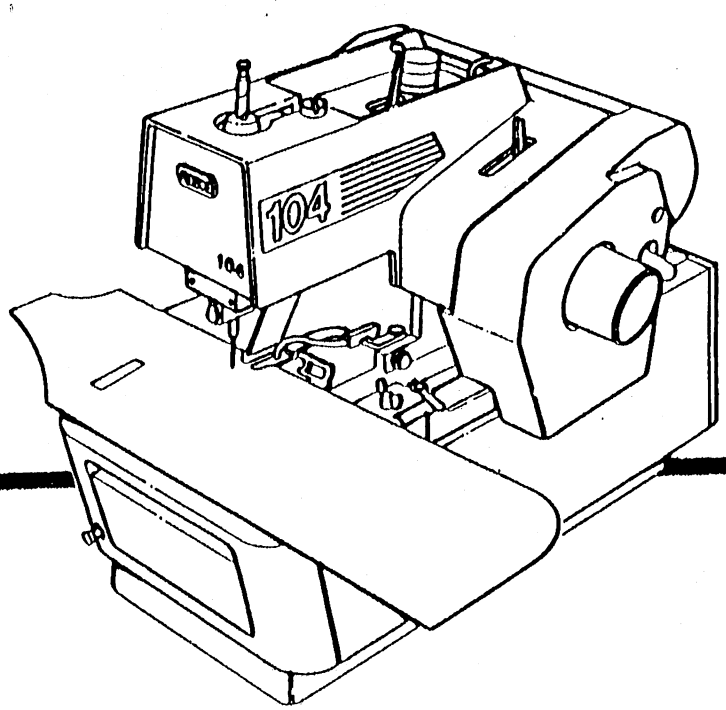
SEQUENCE

Next, there is an operating sequence of the various functions that go into the making of the buttonhole. Each function has a definite purpose and after completing its operation, turns the job over at the right time to its next sequence.

REECE®

BUTTONHOLE MACHINES

series 104-200



Section 1

MAINTENANCE

OPERATING INSTRUCTIONS

TO MAKE A BUTTONHOLE

1. Turn on main power switch and depress control power ON/OFF switch.

2. Secure lower thread and gimp under clip. Insert work material under clamp feet. Clamps may be manually locked or automatically locked by the machine. Draw off three inches of upper thread and hold taut.

3. Depress starting lever. The machine will complete one buttonhole, trim the upper thread, stop and release the work.

4. Remove work material. Trim lower thread and gimp.

TO STOP MACHINE DURING A CYCLE

Press foot pedal to stop all machine operations. This puts machine into emergency stop mode. Emergency stop light and reset button on control box will be lit.

A. To continue sewing:

   Press reset button once (light will start flashing). Press start lever on machine. The cycle will continue from where it was interrupted.

B. To remove garment in case of mislocation of unthreading, release clamps by pushing on clamp lever. Remove material and trim threads.

   Lock clamps and press reset button on control box twice. Machine will rapidly move to home position, ready for next cycle.

COMPONENT FUNCTION—Sewing Head

Control sensors, monitor and switches found on the 104/200 sewing machine.

There are three control sensors with LED indicators found on the sewing head (PROXIMITY TYPE). These are found on the right hand side of the sewing head behind the side cover.

- Left Sensor - This is the Last Stitch sensor. It controls the stopping point of sewing.
- Middle Sensor - This is the First Stitch sensor. It controls the start point of sewing.
- Right Sensor - This is the Home Position sensor. It controls the starting/stopping point of the entire cycle.
- A gap of .015" or less should be maintained between the sensors and their actuators for proper machine operation.

There are two mechanical switches on the machine. These are the start sew switch located under the bedplate, left hand side, and the thread monitor switch, located on top of the machine by the thread tension control. The start sew switch is actuated by the standard start lever, left side of the sewing head.

There is an oil monitor found in the oil reservoir. If the reservoir is empty, the start sew switch is made inoperative.

The syncro for the needle positioning motor is located on the left hand side of the sewing head. This is set to read proper needle up position. Please check Setup section for setting of syncro. The cable from the syncro goes down through the tabletop and connects to the motor control box. A green and yellow wire is connected to the sewing machine base for grounding of the machine.

There are two electric clutches and one electric brake on the 104/200 machine. These transfer the motor drive force to the different parts of the machine.

The bedplate drive clutch:

This clutch (the larger of the two) is located behind the flywheel, lower left side of the machine. When this clutch is engaged, the bedplate is driven directly by the motor. This clutch is engaged when the start sew lever is pressed and disengages when the first stitch sensor is triggered when in SEW position on the control box. After sewing takes place and needle up is performed, this clutch is once again engaged. It disengages when the HOME position is encountered. If in NO SEW position, then the clutch disengages at the HOME position. The bedplate should always be driven when this clutch is engaged. If it is not, check the gap on the clutch and check for oil on the clutch faces.

The sew clutch:

The sew clutch is located on the back shaft above the flywheel, left hand side of the sewing head. This clutch is only engaged during the sewing part of the cycle.

The sew brake:

The sew brake is located on the back shaft behind the handwheel, right hand side of the sewing head. This brake is used to lock the needle in the up position during bedplate travel and at machine rest.

Head harness and cables:

There is one harness connecting all of the above items to the cable from the control box. The control box cable connects to the head harness connector at the lower right hand side of the machine. It then passes through the table and connects to the control box from underneath.

Another cable goes from the control box to the motor control unit. This cable breaks out into three connectors, two to the motor control unit, and one to the emergency stop foot pedal assembly mounted under the table on the crossbar. The cable from this assembly is routed up to the motor control box area.

A cable goes from the motor control box unit to the table power switch. A cable goes from the table power switch to an outlet box mounted under the table, and a cable goes from the outlet box to the incoming power source.

COMPONENT FUNCTION—Control Box

Located on the front of the control box are rotary, pushbutton and toggle switches.

The Sew Speed rotary switch is for selecting one of the four preset sewing speeds:

A = 1750 SPM
B - 1850 SPM
C = 1950 SPM
D = 2050 SPM

The Reset pushbutton switch with LED is used to send the bedplate to the Home position when exiting emergency stop. This switch is active only when the Run/Service switch is in the Run position and the Reset LED is on.

There are four toggle switches on the front of the control box:

Eye Speed - This a three-position switch. This switch controls the sewing speed through the eye of the buttonhole. In the up position, the eye speed is 100 SPM less than the sew speed. In the middle position, eye speed is the same as the sew speed. In the down position, eye speed is 200 SPM less than the sew speed.

Fast/Slow Start - This is a two-position switch. When in the up position (Fast), the machine will start sewing at full sew speed. In the down position (Slow), the machine will start sewing slowing and increase sewing speed in the first couple of stitches to sew speed.

Sew/No Sew - This is a two-position switch. When in the up position (Sew), the machine will perform a normal sewing cycle. In the down position (No Sew), the machine will only cycle the bedplate. No sewing will take place. This is used for running in blocks.

Run/Service - This is a two-position switch. When in the up position (Run), the machine will operate normally and the Run light will be on. The down position is used during servicing of the machine. Power to the drive systems is off (main clutch, stitch clutch and stitch brake). Power remains on to the sensors so that they can be properly checked. The control box is forced into emergency stop.

There are seven LEDs on the control box, providing information to the operator. From top to bottom and across:

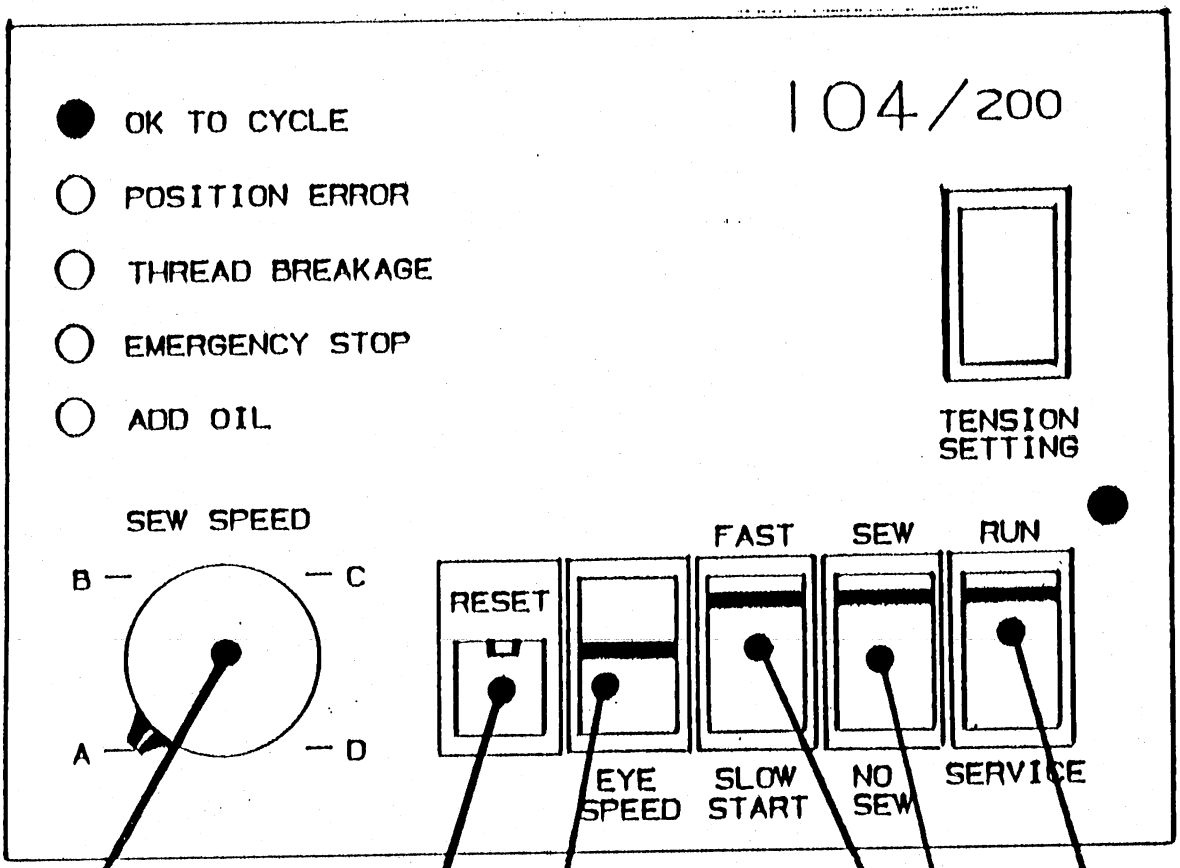
- Green - OK To Cycle
- Red - Position Error
- Red - Thread Breakage
- Red - Emergency Stop
- Red - Add Oil
- Red - Reset
- Yellow - Run

There is a red single digit display on the control box for displaying error conditions to the operator. Refer to Troubleshooting Guide - Flashing Display Readout section for more information about the error numbers displayed.

- NOTE: Thread monitoring does not take place until after about five stitches into the buttonhole.

- NOTE: When the Add Oil LED is on, the start sew switch is interrupted.

CONTROL PANEL LAYOUT



Flashing number means that a problem was found with the machine.

Look up number in display readout table.

Sew Speed

- A = 1750 spm
- B = 1850 spm
- C = 1950 spm
- D = 2050 spm

Eye Speed

Up = sew speed - 100

Mid = sew speed in eye

Dwn = sew speed - 200

Run / Service

Run:

- Normal machine operation. Run light is on.

Service:

- Power to sewing head drive systems is off. Sensor power is still on.

Reset

- Clears Emergency Stop Function. Only works when LED is on and Run / Service switch is in the Run pos.

Fast / Slow Start

Up:

- Start sewing at full sew speed

Down:

- Start sewing slow and ramp up to full sew speed

Sew / No Sew

Up:

- Normal sewing operation

Down:

- Bedplate cycle only, no sewing

SEQUENCE OF OPERATION

SEQUENCE OF NORMAL SEWING OPERATION:

- PRESS THE START SEW SWITCH.
- THE BEDPLATE DRIVE CLUTCH IS TURNED ON, ENGAGES BEDPLATE DRIVE ABILITY.
- THE MOTOR TURNS ON, DRIVING THE BEDPLATE UNTIL THE FIRST STITCH SENSOR IS TURNED ON.
- THE MOTOR TURNS OFF.
- THE BEDPLATE DRIVE CLUTCH IS TURNED OFF, DISENGAGING BEDPLATE DRIVE ABILITY.
- THE SEW BRAKE IS TURNED OFF, ALLOWING NEEDLE BAR MOVEMENT.
- THE SEW CLUTCH IS TURNED ON, ENGAGES NEEDLE BAR DRIVE ABILITY.
- THE MOTOR IS TURNED ON AND RUNS AT SELECTED SEWING SPEED: A, B, C, OR D.
- MACHINE SEWS: THE LAST STITCH SENSOR TURNS ON. (A SHORT DELAY AFTER LAST STITCH SENSOR TURNS ON, THREAD MONITORING BECOMES ACTIVE.)
- DURING SEWING, THE HOME SENSOR IS ACTIVATED BY THE SLOW EYE TARGET. WHILE IT IS ACTIVATED, THE SLOW EYE FUNCTION IS PROVIDED; DEPENDING ON THE SETTING OF THE EYE SPEED SWITCH (REFER TO COMPONENET FUNCTION - CONTROL BOX SECTION), THE SEWING SPEED IS ADJUSTED DURING THE EYE.
- WHEN LAST STITCH SENSOR TURNS OFF, THE MOTOR CONTROL BOX IS SIGNALLED TO PERFORM NEEDLE UP POSITIONING.
- MOTOR PERFORMS NEEDLE UP POSITIONING.
- THE SEW BRAKE IS TURNED ON, DISABLING NEEDLE BAR MOVEMENT.
- THE SEW CLUTCH IS TURNED OFF, DISENGAGING NEEDLE BAR DRIVE ABILITY.
- THE BEDPLATE DRIVE CLUTCH IS TURNED ON, ENGAGINGBEDPLATE DRIVE ABILITY.
- THE MOTOR TURNS ON, DRIVING THE BEDPLATE UNTIL THE HOME SENSOR IS TURNED ON.
- THE MOTOR TURNS OFF, STOPPING THE BEDPLATE TRAVEL.
- THE BEDPLATE DRIVE CLUTCH IS TURNED OFF, DISENGAGING BEDPLATE DRIVE ABILITY.

ENTERING INTO EMERGENCY STOP:

- PRESSING THE FOOT PEDAL AT ANY TIME WILL CAUSE THE MACHINE TO ENTER THE EMERGENCY STOP PROGRAM.
- SETTING RUN/SERVICE SWITCH TO SERVICE POSITION WILL CAUSE THE MACHINE TO ENTER THE EMERGENCY STOP PROGRAM.
- A THREAD BREAKAGE DETECTED DURING SEWING WILL CAUSE THE MACHINE TO ENTER INTO THE EMERGENCY STOP PROGRAM.

WHILE IN EMERGENCY STOP:

- ROTATING NEEDLE BAR WITH HANDWHEEL WILL CAUSE THE POSITION ERROR LED TO COME ON AND THE CYCLE LED TO GO OFF UNTIL THE NEEDLE BAR IS IN THE CORRECT NEEDLE UP POSITION. THEN THE POSITION ERROR LED WILL GO OFF AND THE CYCLE LED WILL COME ON. THIS IS REPEATABLE.
- PRESSING THE START SEW SWITCH WILL HAVE NO EFFECT ON THE MACHINE.

EXITING EMERGENCY STOP:

- THE NEEDLE BAR MUST BE IN THE PROPER POSITION TO EXIT EMERGENCY STOP.
- THE RESET SWITCH MUST BE PRESSED ONCE TO INFORM THE COMPUTER YOU ARE EXITING. THIS WILL CAUSE THE EMERGENCY STOP AND RESET LEDS TO FLASH. NOTE: YOU MUST RETURN RUN/SERVICE SWITCH TO RUN POSITION BEFORE THIS CAN TAKE PLACE.
- THE COMPUTER KEEPS TRACK OF THE POSITION THE MACHINE WAS IN WHEN THE EMERGENCY STOP PROGRAM WAS ENTERED. THIS MEANS THAT IF THE SEWING PORTION OF THE CYCLE HAD NOT YET OCCURRED OR WAS ONGOING, YOU CAN RE-ENTER THE CYCLE BY PRESSING THE START SEW SWITCH. IF SEW HAD ALREADY BEEN COMPLETED, THEN PUSHING START SEW SWITCH WILL DO NOTHING.
- PRESSING THE RESET SWITCH WILL ABORT SEWING AND CYCLE THE BEDPLATE TO THE HOME POSITION.
- IF ANY MOVEMENT OF THE BEDPLATE OCCURRED DURING EMERGENCY STOP, IT IS RECOMMENDED THAT THE RESET OPTION BE SELECTED TO EXIT THE EMERGENCY STOP PROGRAM. THIS WILL CYCLE THE BEDPLATE TO THE HOME POSITION ONLY WITHOUT SEWING.

SETUP AND ADJUSTMENTS—ELECTRICAL

Make sure that the voltage selector switch found on the top operator side of the motor control unit is set to the incoming line voltage. If it is not, then sewing speed may vary during sewing.

Setting up the syncro for proper needle up is done in the following manner:

Position the syncro onto the upper shaft protruding from the upper lefthand side cover. The lower of the two shafts is used to hold the syncro in place and fits inside a groove in the base of the syncro. The upper shaft fits into the center of the rotating collar on the syncro. Do not tighten down the set screws at this time.

Attach the green and yellow grounding wire to the base of the 104 machine in the back at the tapped hole by the table hole for the syncro cable.

Feed the syncro cable down through the hole in the back of the table and connect it to the motor control unit.

Rotate the handwheel until the needle is positioned at the beginning of the top stroke on the proper side of the loopers. This is the point where the needle just reaches the top and starts to flatten out before it starts back down.

Turn on the machine.

Regardless of whether the OK to Cycle LED or the Position Error LED comes on at this time, rotate the collar on the syncro in a top - forward - bottom direction. The Position Error LED will come on or stay on until the syncro detects its needle up position. When this happens, the OK to Cycle LED will come on.

At this point, tighten down the two set screws, locking the syncro to the shaft.

Run the machine in the sewing mode and make sure that the needle is stopping at needle up. If it is not, readjust the syncro as described above until it is stopping properly.

ADJUSTMENTS FOR THE PROXIMITY SENSORS

The three proximity sensors all have the same gap setting, .015" or less. This gap is set by raising or lowering the proximity sensors as needed, one at a time. Do not trust the bracket as an adjustment for the proximity sensors. The bracket is used to adjust for parallel faces between the sensors and their actuators only. The gap must not vary above the .015" limit during the cycling of the machine.

The actuators are set to trigger the home position, start sew, start and end of slow eye, and the stopping of sewing. The right hand sensor is for determining the home position and the starting and stopping of slow eye. The middle sensor is for determining the start position of sewing, and the left hand sensor is for determining the stopping of sewing.

ADJUSTMENTS TO THE LOWER (MAIN) CLUTCH:

This clutch is the main driving clutch for bedplate travel, which includes the cutting operation. If you have a machine which stalls in the cutting portion or which seems to be sluggish in bedplate travel, check the clutch faces for oil. If there is oil on them, clean it off with contact cleaner and let it dry before putting it back together. There is an oil light bearing on the shaft, and the oil hole that was in the handle has been removed. Oil should not be a problem. If oil is not found on the faces, decrease the gap setting, but be careful. This could cause long first stitches. Check for them by sewing at fast start. Slow start could hide the problem. If you have long first stitches, the clutch faces are not coming apart fast enough.

If the machine starts to have long first stitches, then the gap in the clutch has to be increased. There is a .030" shim in there now and if you have to increase the gap, do not go much larger. If the gap becomes too big, the problems mentioned above could develop.

The upper clutch and brake do not have adjustments.

The start sew switch is adjusted by sliding its bracket back and forth.

Though the oil monitor does not have an adjustment, it does control the start sew switch. If you have determined the oil monitor is bad by the Add Oil light not going out, unplug the oil monitor from the harness and jumper pins 3 and 4 of the harness oil monitor plug together. This should shut off the Add Oil LED and allow the start sew switch to work. If it does not, and you jumpered the right pins together, then the oil monitor was not the problem. Put it back, and check the head harness for cut wires.

The thread monitor can be disconnected, if it fails, without causing the machine to stop working.

If the LED on the syncro continuously flashes, then there is a problem with the motor syncro or controller.

If the syncro LED does not come on at all, check the incoming power. If this is okay to the motor, replace motor control unit.

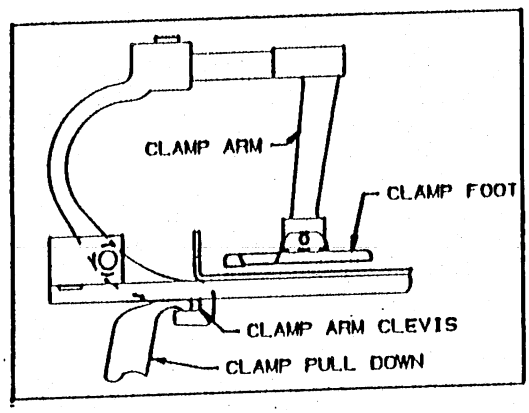
CLAMPING

(FOR ADDITIONAL CB/CA INFORMATION, REFER TO END OF CLAMPING SECTION)

FABRIC CLEARANCE BETWEEN MATS AND FEET

To raise clamp arms for more clearance, loosen nut (A) and turn screw (E) out. For less clearance, turn screw in. Retighten nut.

There should be clearance between clamp arms and clamp pull downs over entire clamp travel. Widen clamp arm clevis as necessary to obtain clearance and prevent any binding.



If adequate clamp height can not be achieved, make sure that clamp yokes (F,G) are correctly positioned on shaft (H). Loosen 4 screws (I) and rotate clamp yokes so they contact the underside of the bedplate. Readjust screw (E) to prevent yokes from hitting bedplate and retighten nut (A).

The 104-200 utilizes automatic compensating clamps with locking clamp spreading so excessive clamping pressure is no longer needed. The proper clamping pressure is achieved when the clamp feet contact the clamp mats in approximately 1/2 the total movement of the clamp lever, Fig. 12. The remaining clamping lever travel activates the automatic compensation feature. To adjust, loosen the large nut on the backside of the stud (B). Loosen nut (C) and turn - screw in for less clamp travel, out for more. Retighten nuts.

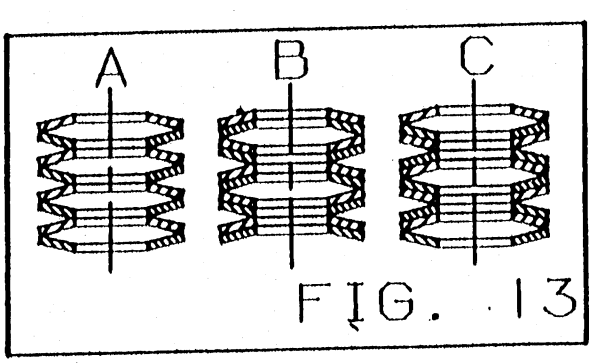
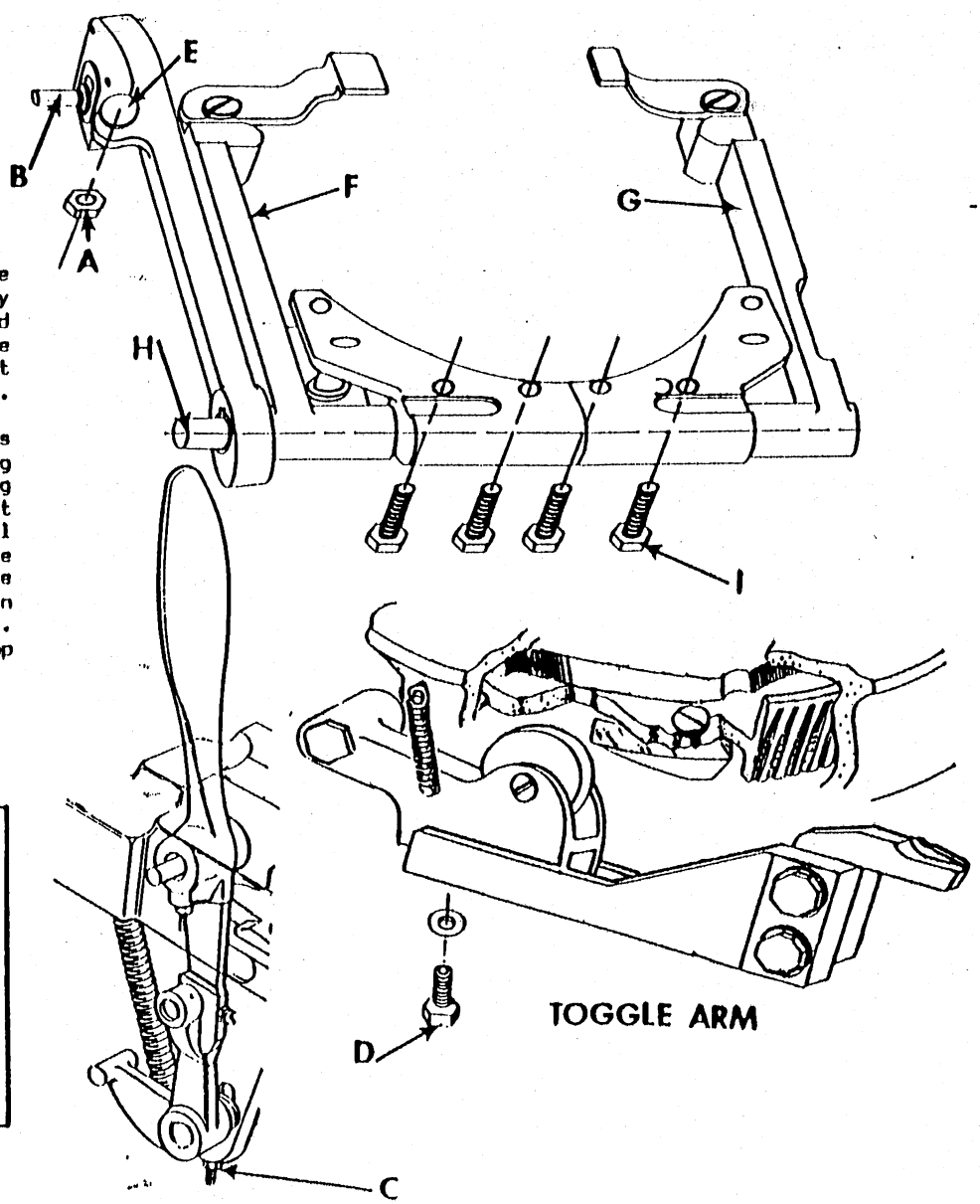


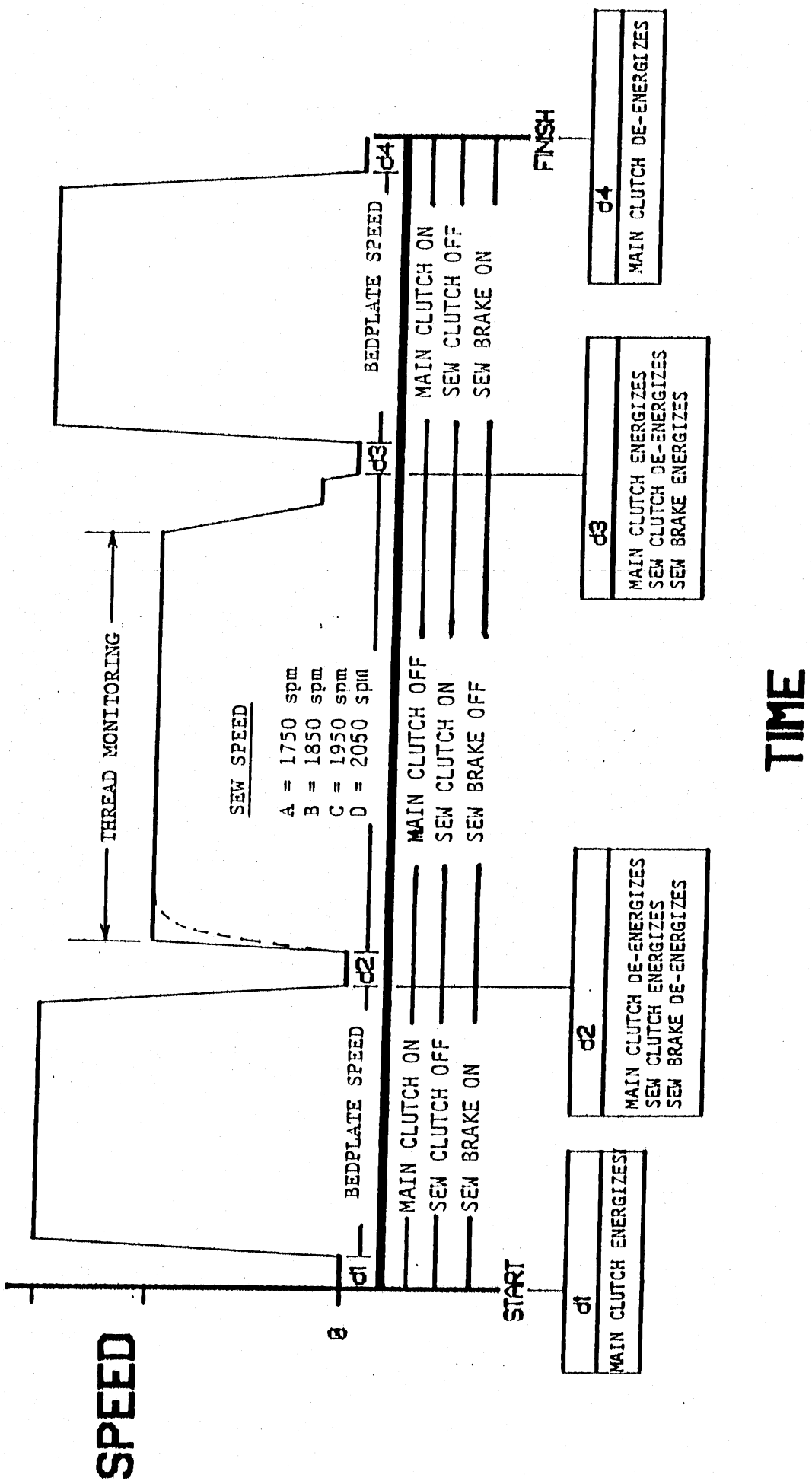
FIG. 13

CLAMP PRESSURE

If additional clamping pressure is needed, the reason for it must be determined. Clamp pressure is only needed to hold the garment securely to the bedplate during the buttonhole cycle. The locking spread holds the clamps in position during the cycle and should be adjusted first as needed. When it is determined that additional pressure is needed, it can be achieved by altering the stacking of the belleville springs. These are factory assembled (see fig. 13A) to provide the greatest amount of automatic compensation. By doubling the springs as shown in Fig. 13B, the clamp pressure will be increased but the ability of the clamps to automatically compensate for various thicknesses of material will be reduced. This can be offset to a limited degree by altering the stacking of the springs as shown in Fig. 13C. The single springs will compress before the double springs, giving a limited amount of compensation to the clamps.



SEQUENCE CHART



CLAMPING

UNCLAMPING

To raise clamps sooner at the end of the cycle:

Loosen bolt (D) and move toggle engaging arm forward for earlier rise, back for later rise. Tighten bolt.

CLAMP SPREADING

Fabrics vary in the amount of spreading required between the clamp plates before sewing begins. In all cases, the clamp plates should spread equally and parallel to each other.

ADJUST FOR PARALLEL SPREAD

Pull the clamp lever to lower the clamp feet and put pressure on the clamp mats. Loosen screws (G) to permit the 'out' stops to float. Loosen screws (F) and pull the clamps sidewards until they rest against the bedplate ledges. Bring screws (F) to bear against the clamp plate edges and tighten. This adjustment causes the clamp plates to spread evenly (parallel to each other).

ADJUST FOR EQUAL SPREAD

Release the clamp lever, allowing the clamps to return to center. Reapply clamp pressure and crank the machine until the widest part of the spreader wedge is between the two rolls (maximum spread).

Adjust the 'out' stops against the sides of the clamp plates so that the space between the clamp plate edges and the bedplate ledge is equal on both sides. Tighten screw (G).

SPREAD LOCKING

As the clamps are brought down, the spread locks compress the spread locking pins; and as the clamps move outward to their maximum spread, the locks move along with clamp plates. This allows the pins to release, locking the clamps in position, until the clamps are released.

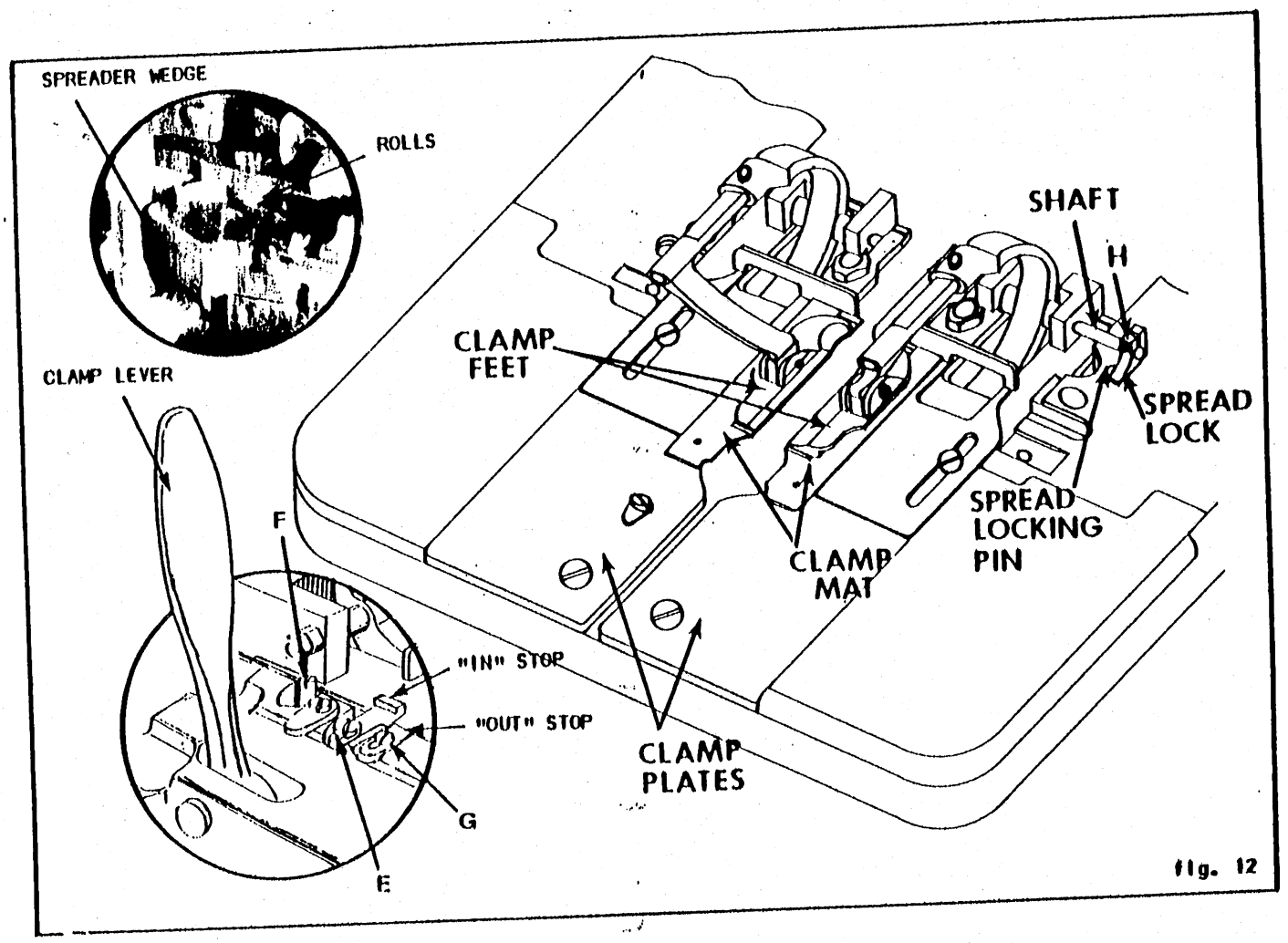


Fig. 12

CLAMPING

ADJUSTMENTS

With the machine in the maximum spread condition, adjust the spread locks (Fig. 12) against the spread locking pins. Loosen screw (H) and slide locks along the clamp arm shaft. Retighten screw (H). Release the clamps. The spread locks should now be above the spread locking pins, allowing the clamps to return to their center position. To adjust: loosen screw (H) and rotate the spread locks so they clear the tops of the locking pins.

ADJUSTMENT FOR AMOUNT OF SPREAD

The amount of spread needed to obtain the best result depends upon the type of fabric. Thicker fabrics usually require more spread than thinner fabrics.

To obtain more or less spread:

Loosen screws (E) and move the 'in' stops inward for more spread or outward for less spread. The 'in' stop position must be identical on each side or uneven spreading will result.

On CB machines, the center stroke of the needle must enter the cut; however, too much spread will narrow the bite of the vibration stroke. Try to obtain maximum bite by having mimimum spread. The effect will be to pull the buttonhole together.

On CA machines, the spread is not as critical; however, it is important to hold material firmly and spread equally on both sides so that the knife will not cut the stitches.

REPLACING CLAMP PARTS

CLAMP MATS

A new clamp mat must be contour filed and beveled to permit clearance between the edge of the mat and the throat plate when the machine goes through its cycle.

Remove clamp arms by means of screws (A). Check to see that the clamp plates are adjusted for parallel spread (see pages 1-7). With the clamp plate held to maximum spread against the 'out' stop, move the 'in' stop outward to hold the clamp plate in the maximum spread position. Crank the machine slowly through its cycle. Remove and file the new clamp mat to obtain the following clearances:

On AF-CB and AF-CB/CA models, file the mat contour to clear the throat plate shoulder by 1/16" throughout the cycle.

On AF-CA models, file the mat contour to clear the raised portion of the throat plate by 1/32" all the way around.

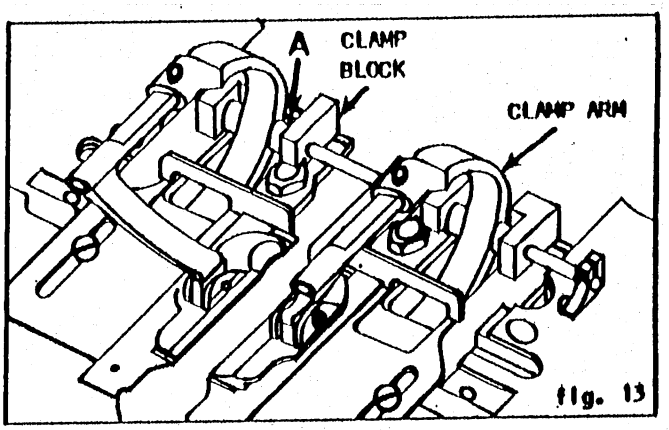


fig. 13

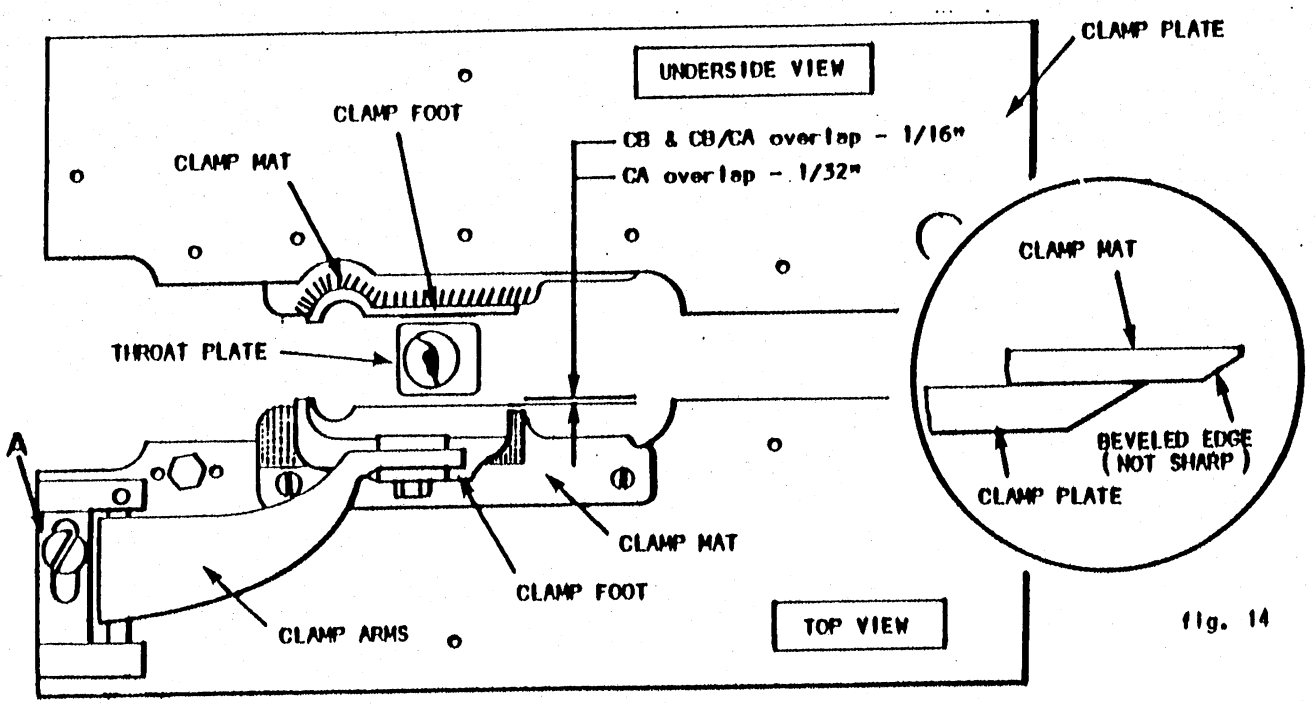


fig. 14

When contour filing, an attempt should be made to finish between two rows of knurls for greater strength.

The underside of the clamp mat should now be filed to provide bevel for throat plate clearance when the clamp plates are under pressure from the clamp arms (see insert). The beveling operation must leave enough stock at the contoured edge so that the material can be held firmly without breaking the edge. All burrs and sharp edges must be removed.

CLAMP ARMS AND FEET

Clamp arms are installed so that the edge of each foot overlaps the clamp mat by the same amount that the clamp mat was set to clear the throat plate.

To adjust, loosen screw (H) and slide clamp block in or out as necessary.

Grind the foot contour to follow the mat contour. Remove all burrs and sharp edges.

Adjust clamp feet for fabric clearance as described on pages 1-6.

CLAMP PLATES

To assure that clamp plates seat in the bed of the machine without rocking, they are slightly crowned to assure that all four corners contact the bed at the same time. The crowning should not be easily visible, but can be detected when a straight edge is held against the underside. To test for even contact at all four corners, place the clamp plate in position on the bedplate. Hold one front corner to see if any 'rocking' occurs. This procedure is repeated on the two remaining opposite corners.

The clamp plate may be bent slightly to obtain equal seating on all four corners.

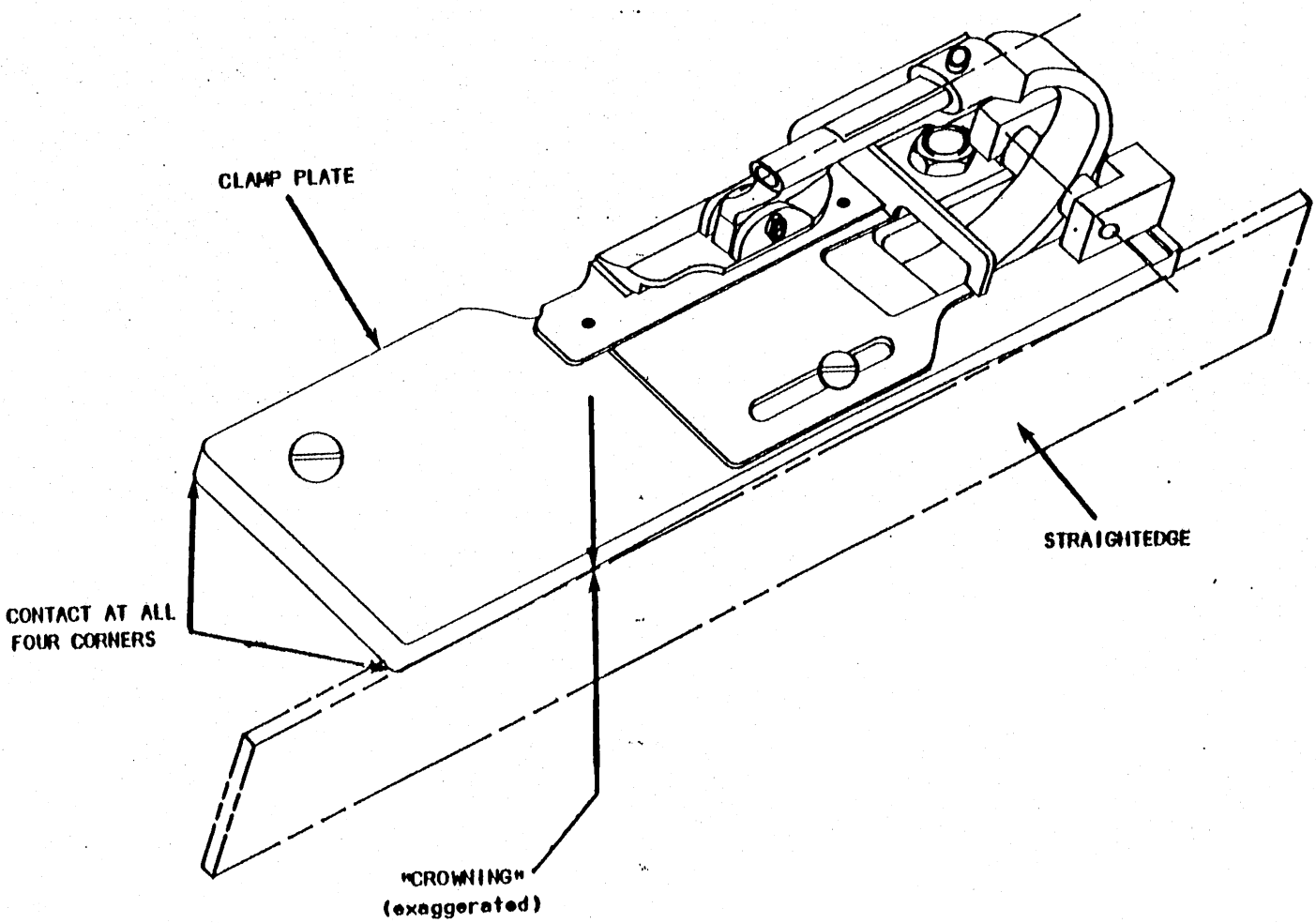


fig. 15

ALIGNING FLY BAR PLUNGERS WITH CAM PLATE

Plungers should enter slots in cam plate to a depth of 1/8 inch maximum.

To adjust: take up or let out with nuts (A).

Plunger (B) should enter slot in cam plate when the roll on the lateral lever is at the peak (D) of the main cam.

To adjust: loosen nut (C) and tap bedplate.

Crank machine until the roll on the lateral lever is just captured by track on main cam. At this point, bracket (G) on bedplate should have contacted lever (H).

To adjust: loosen screw (E) and adjust bracket (G) against lever.

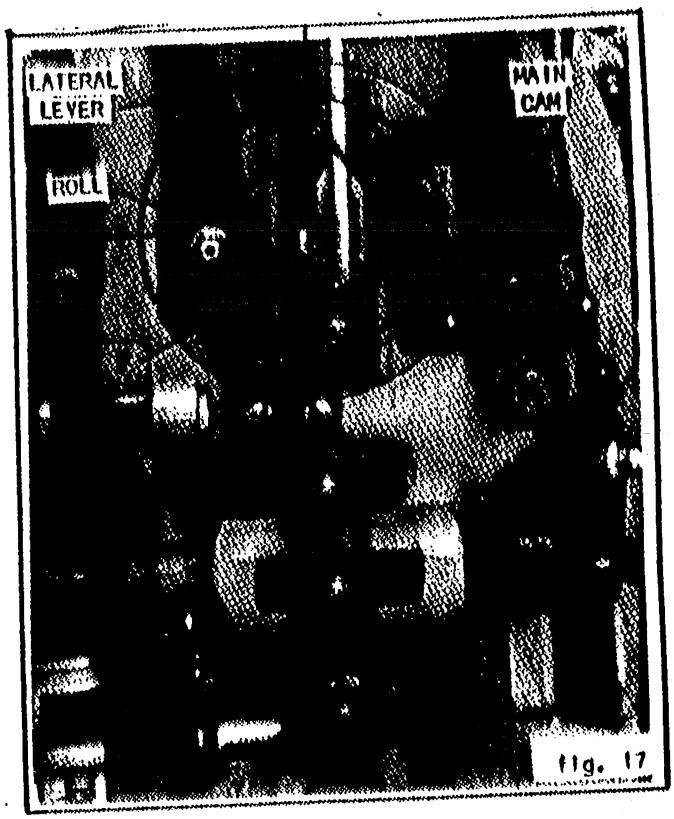


fig. 17

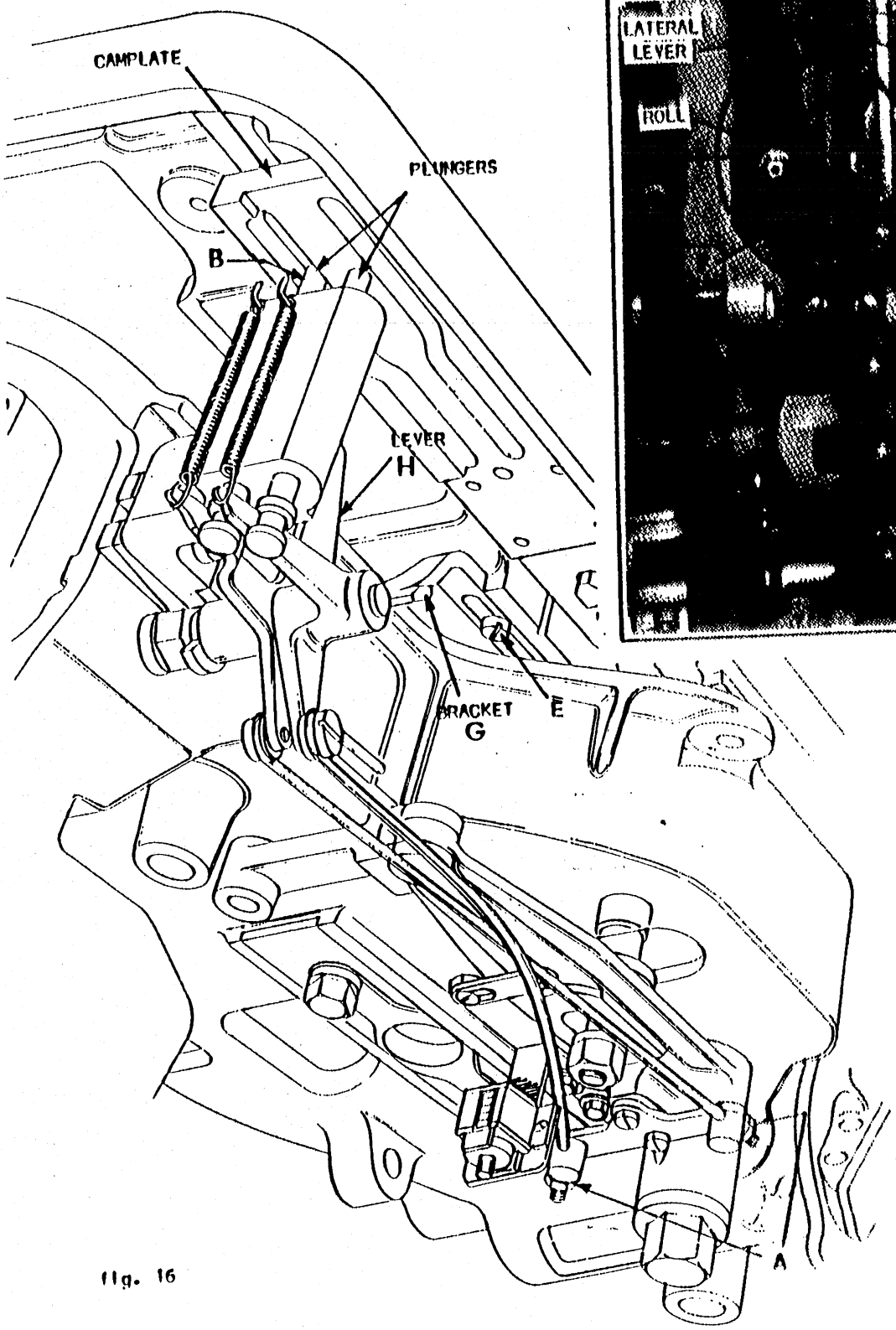


fig. 16

FLYBAR TACK

The end of the flybar tack should cross over the beginning flybar tack and continue one or two stitches longer. On buttonholes with no flybar, the ends of the stitching should be equal.

To adjust: loosen screw (F) and slide last stitch block back to shorten second flybar tack, forward to lengthen. Retighten screw (F).

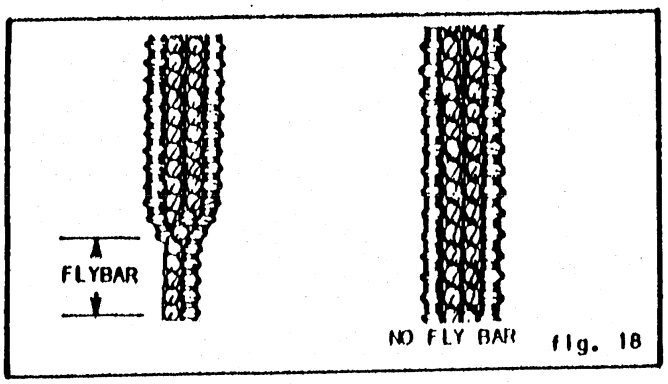


fig. 18

FLYBAR LENGTH

To adjust the length of flybar the machine will produce:

Loosen screw (J) and move lever forward for shorter flybar and back for longer flybar. Range of adjustment is from zero to 3/8 inch. Tighten screw.

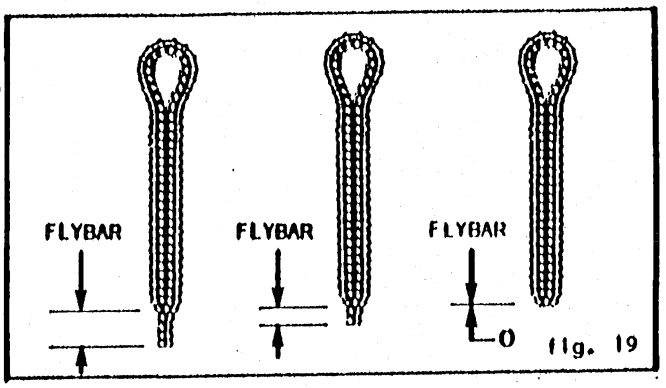


fig. 19

BUTTONHOLE LENGTH

To change the length of the buttonhole the machine will produce:

Loosen screw (H). Move screw and length plate to line up arrow with length desired on length guide. Range of adjustment is from 1/2 to 1-1/4 inches on regular travel machines. Tighten screw.

Change cutting steel to conform to length setting.

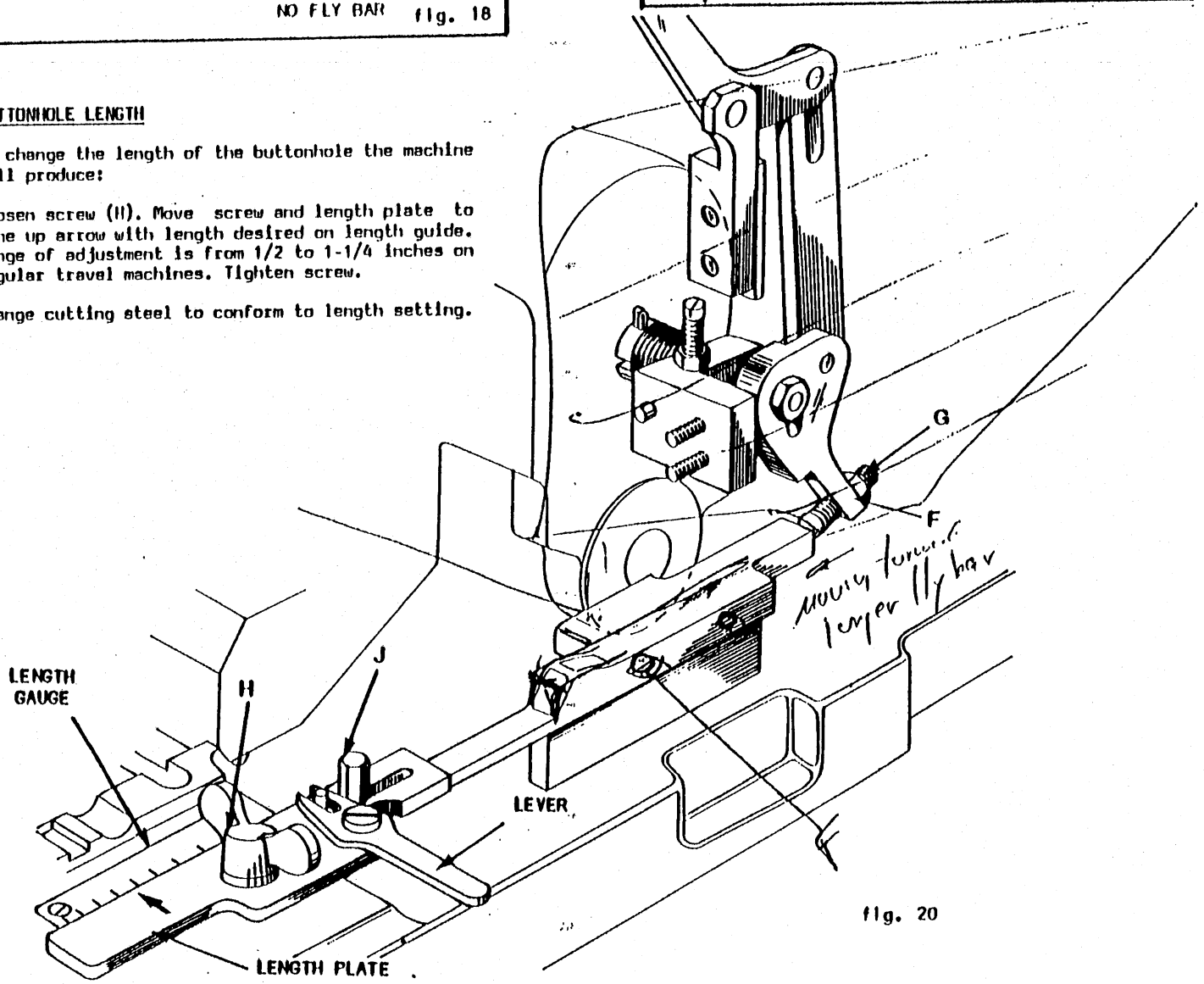


fig. 20

LATERAL MOVEMENT
(Movement of stitch pattern around eye)

Raise the bedplate and check to see that screws (K) lie in the horizontal plane. If not, loosen screws (L) and correct.

'Pricking-In' Test: Precise alignment can be observed with the use of a 'pricking' needle (P/N 02-0001) and a piece of kraft paper clamped in the sewing position. A 'pricking' needle is much shorter than a regular needle and is used to provide a pattern of needle punctures in the paper.

After observing shape of eye, proceed as follows:

If the lateral movement starts 'too late', loosen eye stud (M) and move upward to advance lateral timing. Tighten (M).

If the lateral movement starts 'too soon', loosen eye stud (M) and move down to retard lateral timing. Tighten (M).

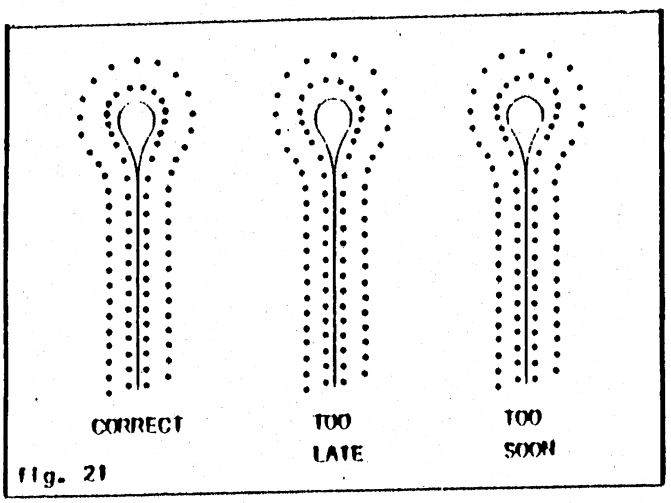


fig. 21

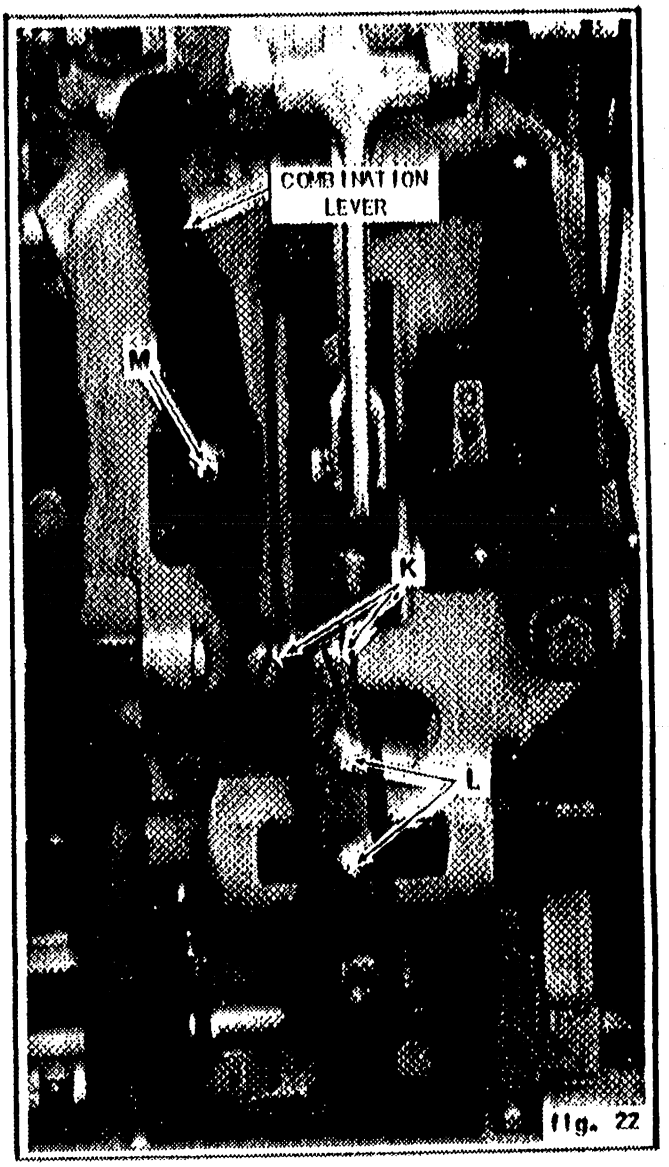


fig. 22

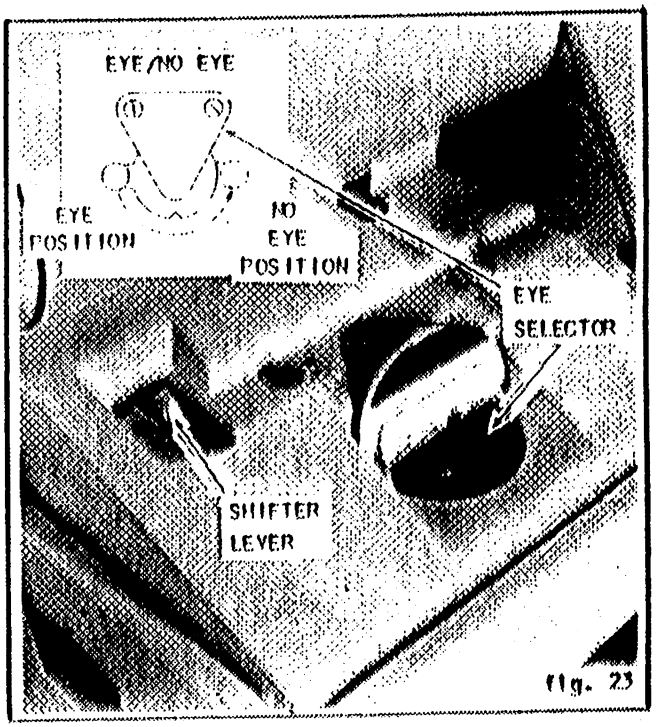


fig. 23

EYE/NO EYE

To stitch a straight buttonhole without an eye:

1. Move eye selector to no eye position.
2. Pull shifter lever forward to take stitches out of the eye.
3. Change cutting knife.

Also, see stitching and cutting sections.

THROAT PLATE HEIGHT

When a new race has been installed, the top surface must be filed in order to obtain the correct height of the throat plate in the machine.

Before filing, remove any excessive play between the head and the cam case as follows:

With bedplate in most forward position, loosen locknuts (U) and turn screws (V) inward until the play of the bedplate between the head and the cam case is eliminated - or all wink, tighten locknuts (U). Check rear support for flat contact with underside of bedplate (fig.30).

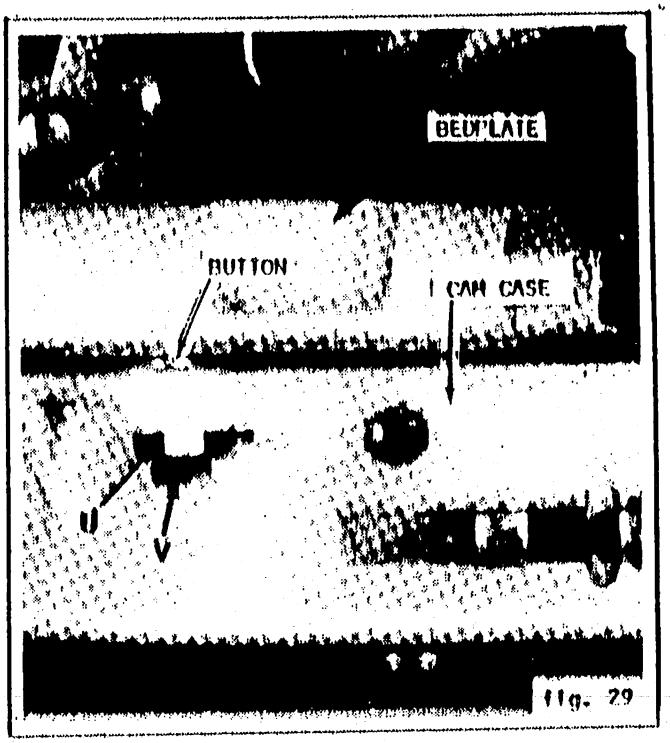


fig. 29

CAUTION: It is quite possible to adjust the screws further than necessary, thereby causing a drag. For good machine performance, the adjustment should be just sufficient enough to keep the head and bedplate runways in contact with each other with a minimum of friction.

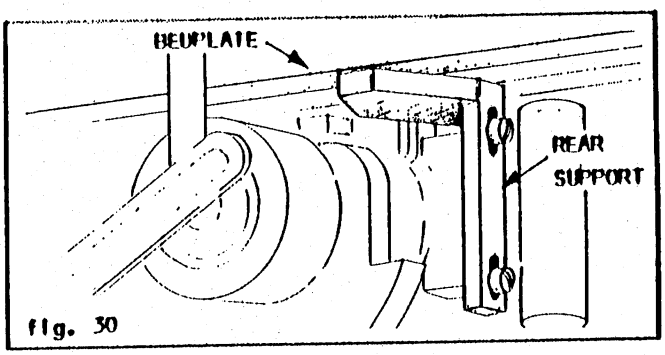


fig. 30

FILING TOP OF RACE

Place gauge (03-0270) across the top surface of the race (X) and bedplate at surfaces (W) and (Y). Then carefully file the top surface (X) flat until it measures exactly 3/32 of an inch above surfaces (W) and (Y).

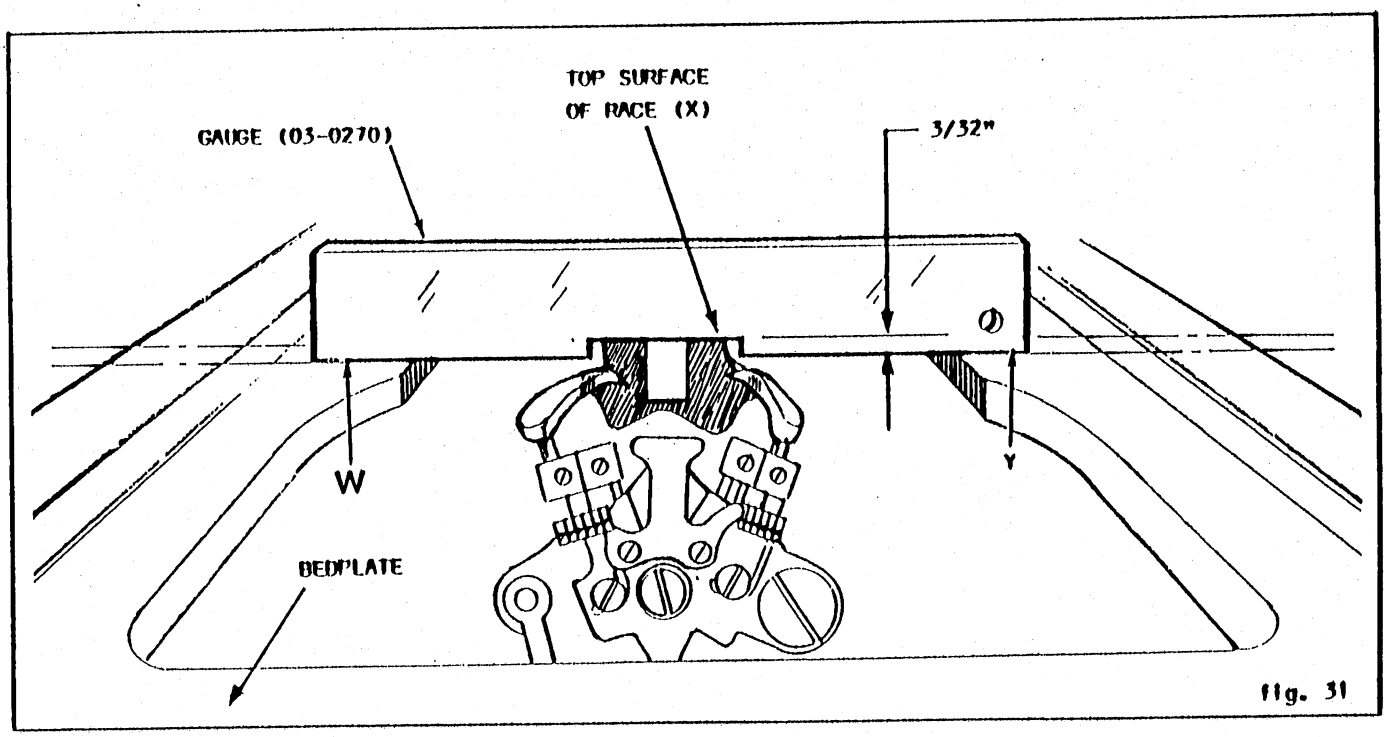


fig. 31

RACES

LOWER RACE

The lower race must be square with the bedplate when stitching the straight sides of the buttonhole.

To adjust: loosen screw (N) and move lower sector. When assembling lower sector and gear, make certain sector teeth will not disengage at either end of swing. Tighten screw (N).

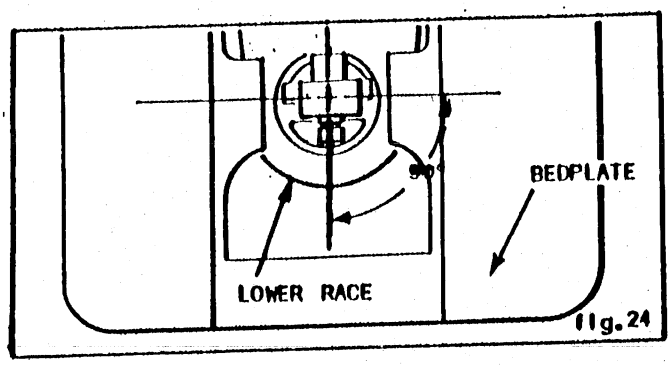


fig.24

UPPER RACE

The needle should rotate in perfect alignment with lower race.

To adjust: loosen screw (P) and move upper sector. When assembling sector and gear, make certain sector teeth will not disengage at either end of swing. Tighten screws (P).

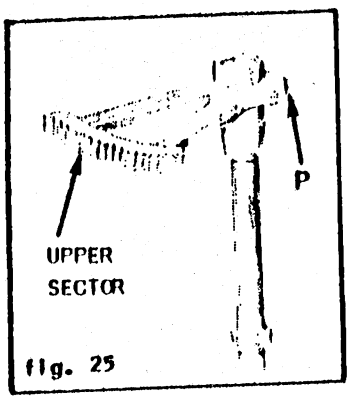


fig. 25

To check alignment of upper and lower races: remove clamp plates and lift bedplate to its full back position. Crank machine until trimmer knife spindle is vertical. Sight along knife spindle to button caps on needle bar.

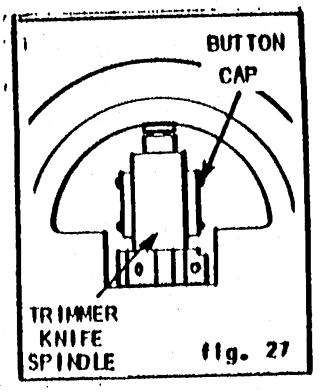


fig. 27

SECTOR TURNING

When stitching the end of the eye, the race must turn exactly 180°. To adjust: loosen stud (P) and move forward for more turning, move back for less.
The race must begin to turn at the outermost point (Q) of the buttonhole eye and stop turning at other outermost point (R).

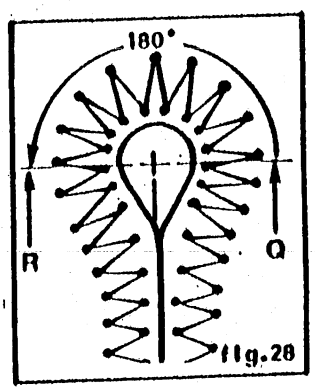


fig.28

To adjust: loosen nut (S) and move stud forward to retard turning of the race. Move back to advance.

The race should be free to turn without play.

To adjust: loosen screw (T) in collar and tighten collar against bearing rings. Tighten screws (T). The adjustments in this section are so related that each affects the others. While the adjustment should be made in order, it may be necessary to re-check steps after making other adjustments to obtain correct results.

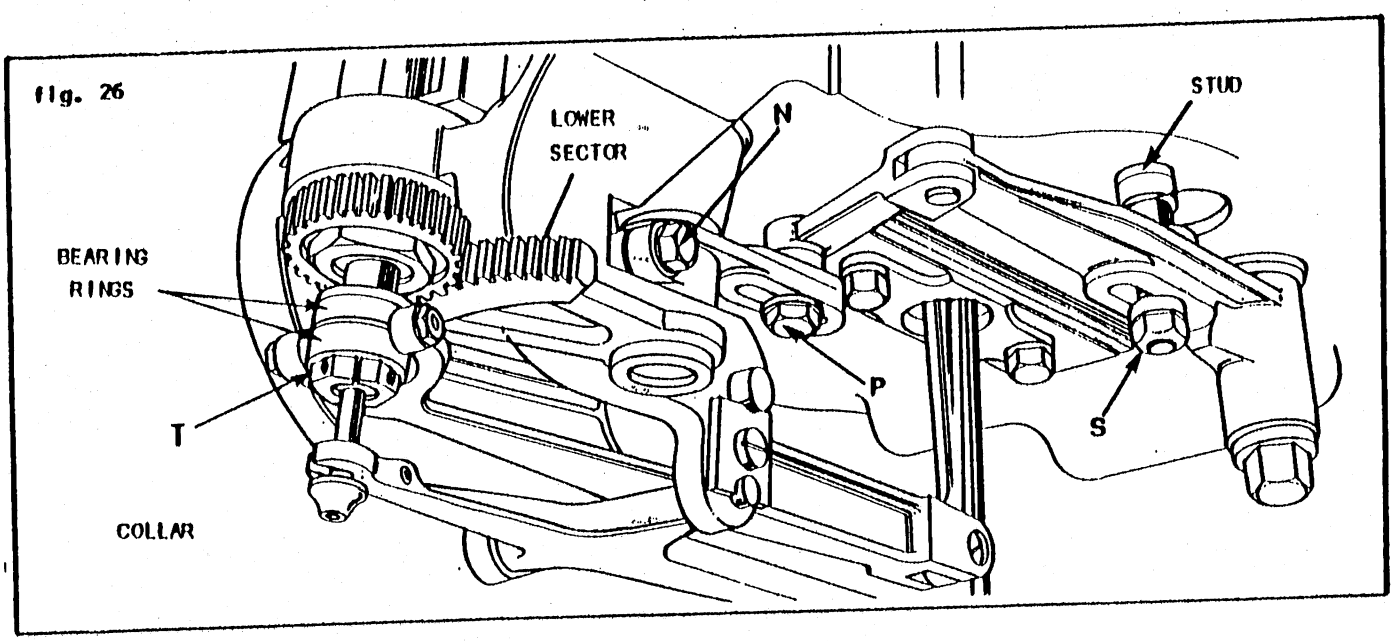


fig. 26

CUTTING SPACE

On Cut-After machines, the cutting space, or distance between the two banks of stitches, must be wide enough so that the knife will not cut the stitches. The ideal width depends upon the materials used and the appearance wanted. (Thin fabrics generally require less cutting space, while heavier fabrics require more.)

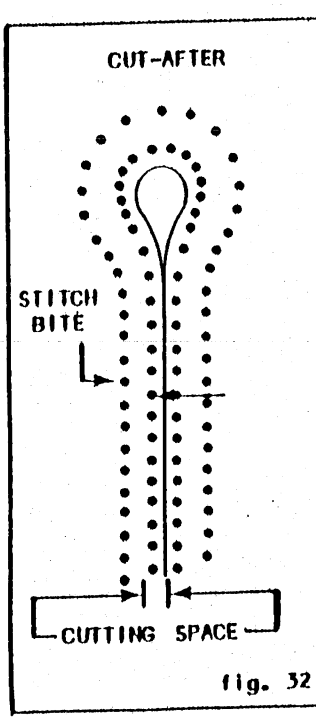


fig. 32

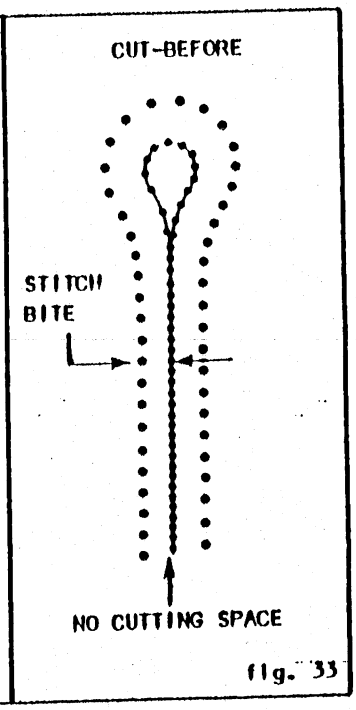


fig. 33

To adjust: loosen screw (A) with a 1/4" wrench. Move screw and barrel clockwise to decrease, and counterclockwise to increase cutting space. Tighten screw.

On Cut-Before machines, there should be NO cutting space. The center stroke of the needle must fall directly in the center of the cut. To obtain accurate adjustment, clamp a sheet of paper on the bedplate. Crank the machine slowly along the straight side of the buttonhole while bringing the needle down on its center stroke to make periodic small punch marks in the paper. Repeat this procedure on the other straight side of the buttonhole.

All center punch marks will fall in a straight line if the cutting space is accurately set. Procedure for adjusting is otherwise the same as that for a Cut-After machine.

STITCH BITE

The stitch bite or distance between the two points of entry of the needle as it vibrates should be sufficient to cross over the gimp without striking it. The ideal width depends on neatness and the type of material.

To adjust: loosen nut (B) and move drag link down to increase stitch bite. To decrease, move up. Tighten nut. Standard bite = 3/32".

ANY CHANGE IN CUTTING SPACE OR STITCH BITE REQUIRES THE ADJUSTMENTS OF THE LOOPERS BE CHECKED.

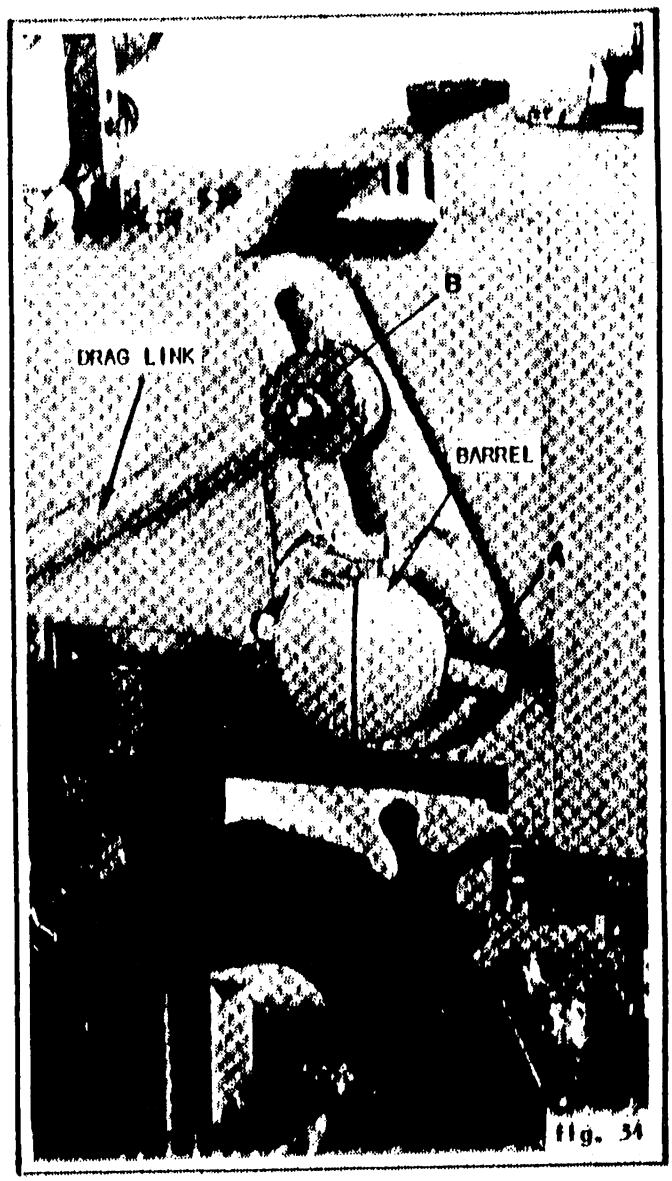


fig. 34

NOTE: For servicing thread tensions, refer to section on threading.

LOOPER ADJUSTMENT

LOOPER TO NEEDLE ADJUSTMENTS

To examine or correct the looper to needle adjustments, remove the clamp plates and the throat plate. Turn the left side crank until the stitch wheel unlocks. Turn the stitch wheel counterclockwise.

TIMING

As the needle bar rises 3/32 inch from its lowest position on either the center or vibration stroke, the following relationship between the needle and each looper should exist: the leading edge of the looper should be on the center line of the needle and the center of the eye of the needle should be approximately 3/32 inch below the looper.

NOTE: These specifications are standard for most thread and materials.

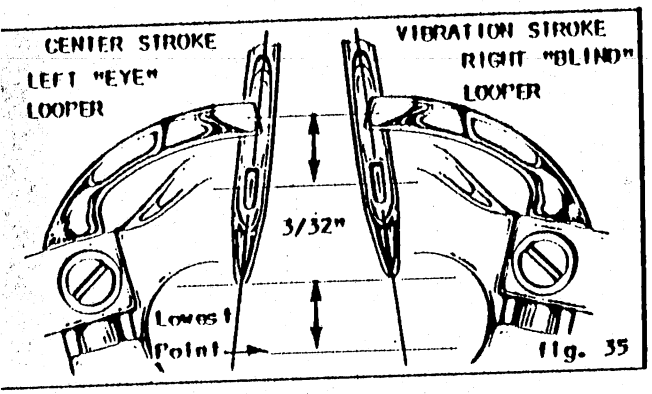


fig. 35

The needle bar rise on either stroke may be measured by applying a scale at the needle bar cap.

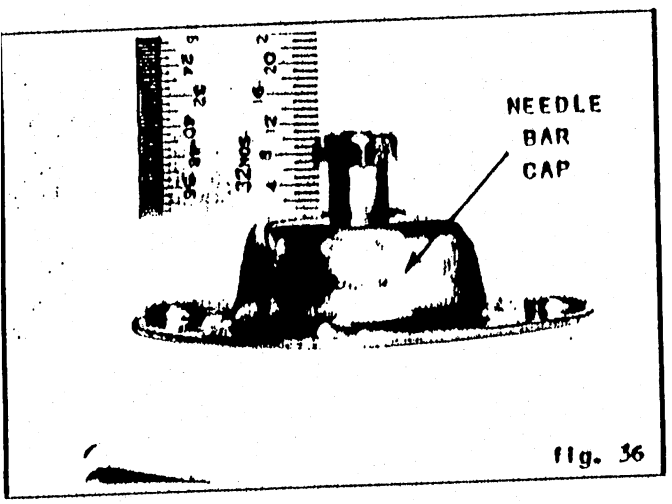


fig. 36

If, in a needle rise of 3/32 inch, one looper is 'early' and the other is 'late', they must be 'equalized' by loosening screw (E) in the lower race and moving the crosshead 'up' or 'down' as required.

fig. 37

To obtain accurate equalization, all 'up' and 'down' play must be removed from the split collar yoke. Sidewise movement in the split collar must be maintained or a bind may be created as the race turns around the eye, causing stitches to pile up.

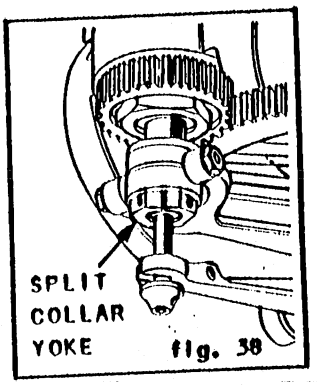


fig. 38

If, in a needle rise of 3/32 inch, both loopers are too 'early' or too 'late', decrease or increase the loopers equally by loosening screw (F) and turning core using spanner wrench (03-0011).

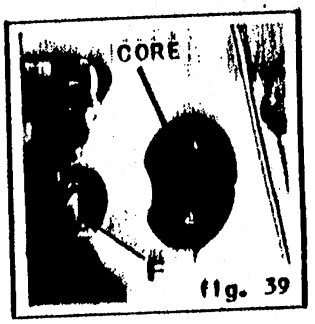


fig. 39

When the loopers have been correctly equalized and timed, check the position of the needle eye below the looper. This should be approximately 3/32 inch; if not, loosen screws (G) and raise or lower the needle bar as necessary.

fig. 40

NEEDLE CLEARANCE

When a needle has risen 3/32 inch on either stroke, the needle-to-looper clearance should be as close as possible without touching (.005 max.). Loosen set screw (H) and adjust.

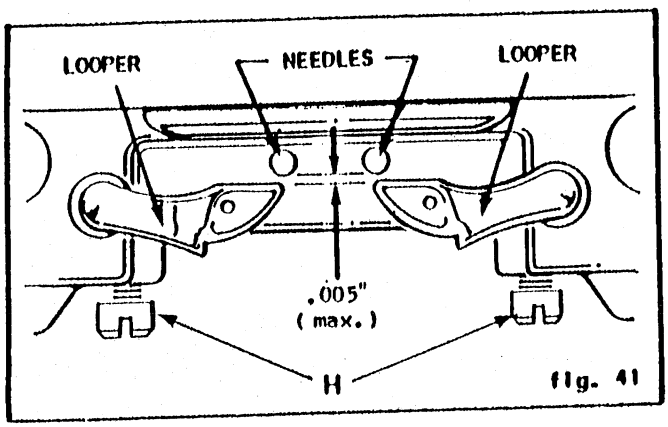


fig. 41

SPREADER ADJUSTMENTS

SPREADER STOPS - When the needle bar is at its lowest point, neither spreader will be in contact with the spreader wedge. Both spreaders should be held by tension of the springs and the spreader stops as shown.

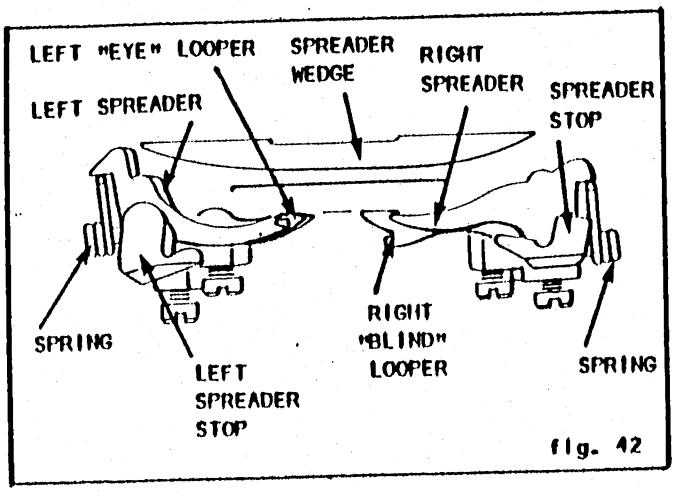


fig. 42

Set the left spreader stop so that the fork of the left spreader straddles the eye in the looper and the inner face of the left spreader is flush with the corresponding inner face of the left looper.

Set the right spreader stop so that the inner face of the right spreader is flush with the corresponding inner face of the right looper.

Check the action of both spreaders to assure that they do not bind against the top surface of the loopers or the spreader stops.

The position of the descending needle on each stroke as the loopers and spreaders are backing away is shown (fig.43). It is important that the space (J) between the needle and spreaders be equal on both sides. The left hand spreader should be adjusted and the right hand spreader bent to match. The left hand spreader should have clearance over looper thread. Right spreader should ride the top of the looper without binding.

Adjust spreader wedge timing with nut (K) on connection (L).

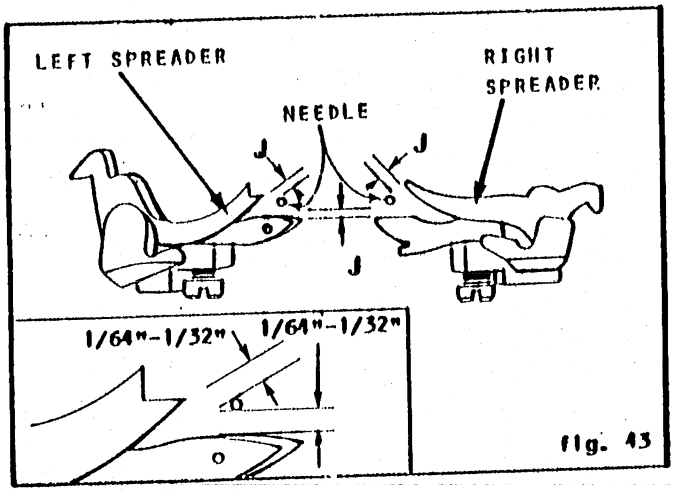


fig. 43

When the limit of adjustment provided by connection (L) is obtained, additional adjustment is provided as shown. Loosen screw (M) and raise or lower crosshead. The crosshead must not be allowed to bottom on the casting in any part of its stroke. After moving the crosshead, adjust again as in fig. 44.

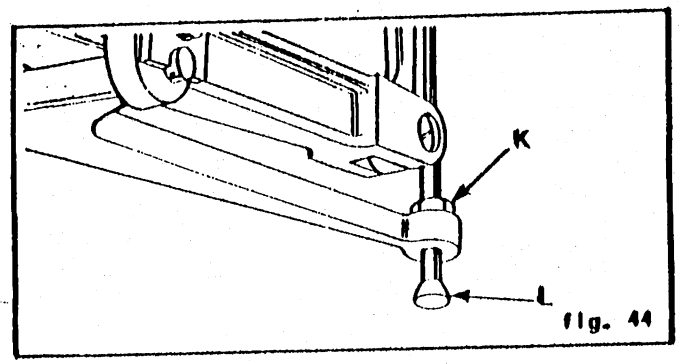


fig. 44

If the spreader wedge or spreader spindle are unduly worn, it will be difficult to make the above adjustment correctly and these parts should be replaced.

Spindle upper end should extend just 1/32" above crosshead to eliminate any thread groove from forming on aluminum crosshead.

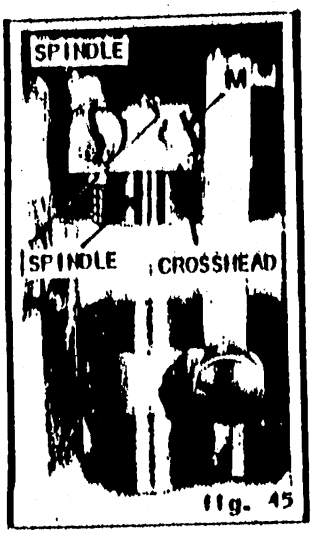


fig. 45

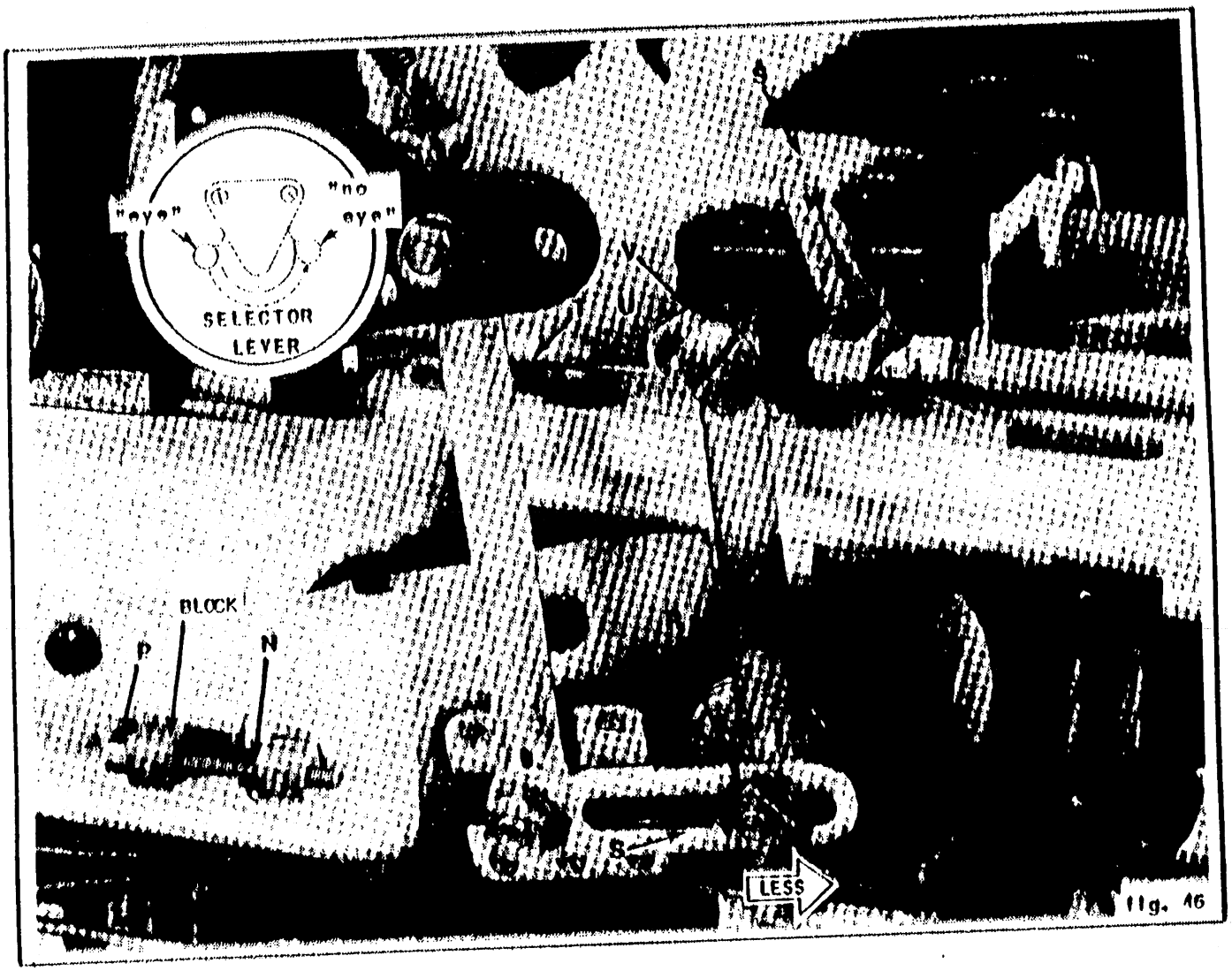


fig. 46

To increase or decrease the number of stitches on each side of the buttonhole, first check button and rear support adjustment as described on page 1/14.

Worm shaft collar should be adjusted by loosening screw (Q) and reset collar to compress spring washer one-half way. Retighten screw (Q).

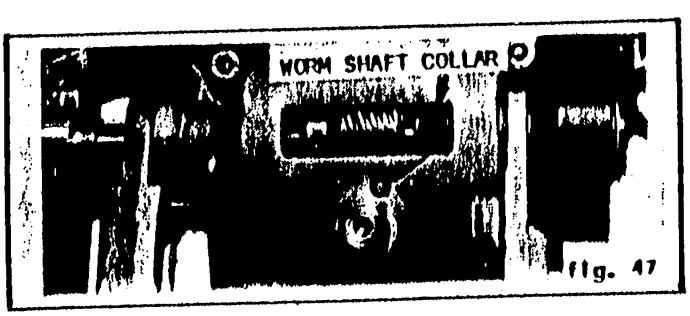


fig. 47

STITCH PER INCH (Stitch Density)

To increase or decrease the number of stitches throughout the buttonhole: loosen nut (R) and move link (S) as indicated to obtain more or less stitches per inch.

To retain or decrease the number of stitches in only the eye portion of the buttonhole:

No Eye Buttonholes - change selector lever on bedplate to the 'No Eye' position. Move lever (S) to the 'No Eye' position. Loosen screw (T) and move the decrease wedge (U) forward so that roll (V) will descend the beveled portion of the wedge while the race is turning and the 'No Eye' is being stitched.

Eyelet End Buttonholes - change selector lever on rear of bedplate to the 'Eye' position. Move lever (S) to the 'Eye' position. Adjust stop screw (W) to limit the descent of roll (V) while the eye is being formed. The desired number of stitches in the eye is obtained by the adjustment of stop screw (W).

SLOW EYE ADJUSTMENT

A switch on the control panel allows you to slow down the stitching speed of the machine as it sews around the eye of the buttonhole. The switch has 3 positions:

1. UP - allows a speed reduction 100 spm in the eye.
2. CENTER - normal sew speed around the eye.
3. DOWN - allows a speed reduction of 200 spm in the eye.

To adjust the timing when the slow speed occurs:

1. Put machine in service mode.
2. Slowly hand crank machine until flybar pin has withdrawn from flybar cam. Slowly continue cranking machine until bedplate just starts its sideward movement to form the eye. At this point, the leading edge of the slow eye block should just be under the sensor and the sensor LED should be on. If not, loosen screw (X) and slide slow eye block until its leading edge is under the sensor and the sensor LED is on. Retighten screw (X).

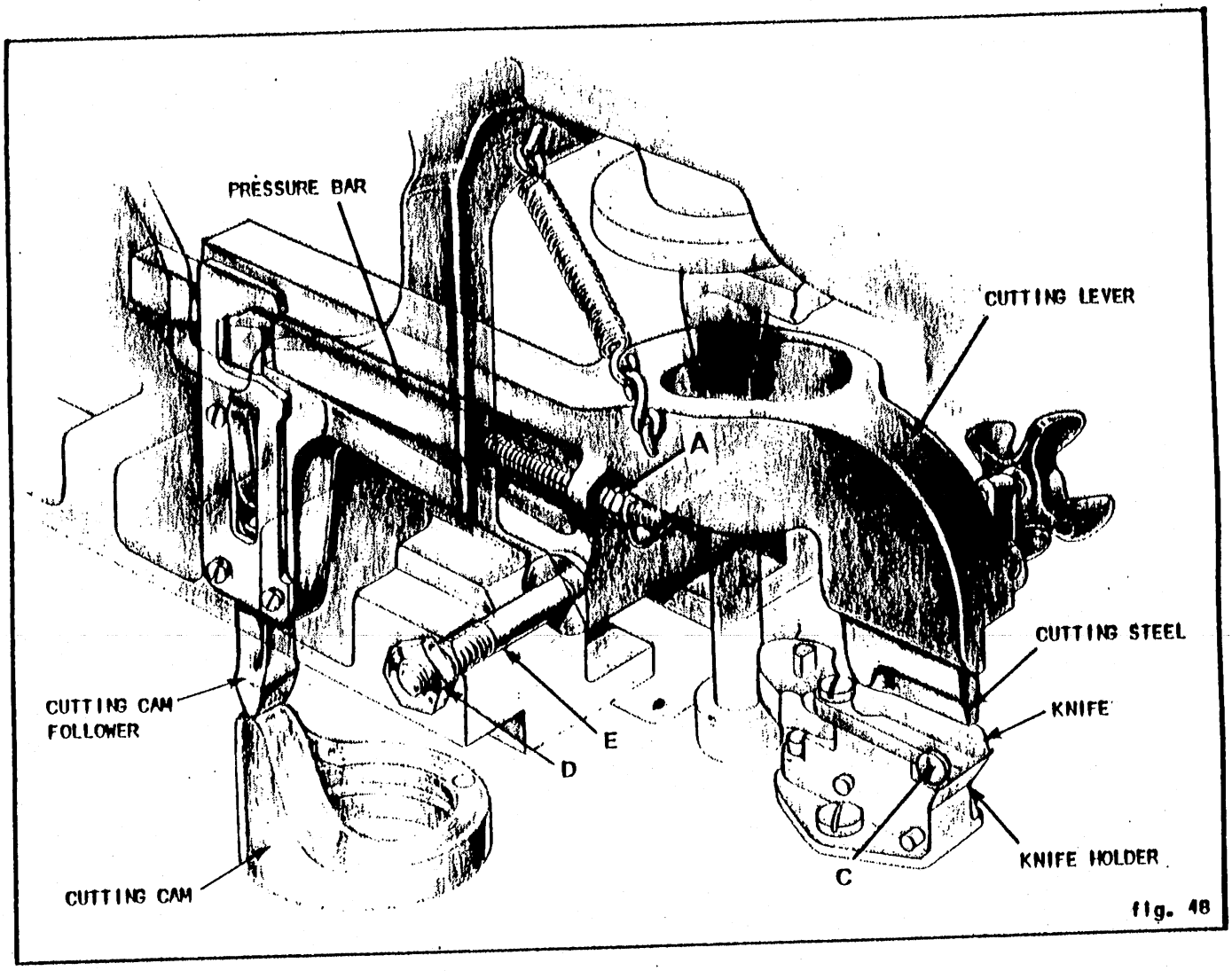


fig. 48

First consideration in cutting is the pressure of the cutting steel upon the knife.

The knife must be aligned to the cutting space and then the cutting steel is aligned to the knife.

The straight edge of the knife (on all machines) must be centered in the cutting space. The appearance of the eye is enhanced if the eye cut is made slightly forward (toward operator) with respect to the stitching around the eye.

CUTTING PRESSURE

Hand crank the machine through one cycle to determine the cutting pressure. The greatest cranking effort is when cutting occurs. If there is difficulty in hand cranking the machine through the cutting position, remove pressure by loosening locknuts (A) counterclockwise to relieve pressure and clockwise to increase pressure as necessary. Retighten nuts.

LOCATING THE KNIFE

The position of the knife holder on the cam case is set. Further adjustment is possible, but seldom required.

Precise alignment of the knife to the cutting space can be obtained with the use of a 'pricking' needle (02-0001) and a piece of kraft paper clamped in sewing position. (A 'pricking' needle is much shorter than a regular needle and is used to provide a pattern of needle punctures in the paper.)

The machine is now cycled under power and the location of the knife cut, with respect to the cutting space, is easily seen. To reposition the knife, loosen screws (C). Retighten screws to hold the knife in the correct position.

Centering the knife in the cutting space can also be accomplished by hand cranking the machine through its cycle. A standard needle is employed and when the stitch wheel unlocks, it can be turned to bring the needle 'down' and 'up' on its center stroke, making visible puncture marks on paper clamped in place. By periodically repeating the puncture marks, a definite cutting space pattern is formed.

CUTTING

LOCATING THE CUTTING STEEL

The cutting lever should be adjusted so that the impression of the knife will be centered on the cutting steel. Back off cutting pressure and check visually for match up between the block and knife.

Set sew/no sew switch to no sew. Press starting lever. The machine will quickly make one complete cycle under power without stitching. Remove the cutting steel and examine the impression made by the knife.

Loosen nuts (D) and adjust screws (E) to locate the cutting steel so that the knife blade impression will be centered on the steel. Before tightening the nuts, check to see that all side play is removed from the cutting lever.

MAKING A CLEAN CUT

The knife impression made on the cutting steel must be distinct and complete. If only a partial impression is seen, either the knife edge may be broken (dull) or the surface of the cutting steel is uneven. If the knife edge is at fault, replace the knife. If a new knife does not produce a complete impression, remove the cutting steel and file the high points as indicated by the impression.

Final proof of clean cutting is determined when the buttonhole is produced in the garment. It may be necessary to add some cutting lever pressure. Under no circumstances should cutting lever pressure be allowed to exceed that amount which can be applied by hand cranking the machine through its cycle.

If unable to obtain adequate cutting pressure by adjustment, the cutting cam follower or the cutting cam may be badly worn. Before replacing either of these parts, first try a new cutting steel and knife.

TRIMMING

When the stitching ends, continuing rearward travel of the bedplate causes wedge (A) to strike trip lever (B) and continues beyond wedge.

This causes shaft (C) to revolve, pulling the actuator (D) down. Trimming actuating arm (H), located beneath the head of the actuator, is likewise pulled down, rotating the knife to the right. The smooth rounded side of the knife brushes one leg of the thread as it passes.

As trip lever (B) continues beyond wedge (A) and is released, the actuator (D) rises quickly to release the knife which springs back to the left, cutting the front leg of the thread loop (fig.53).

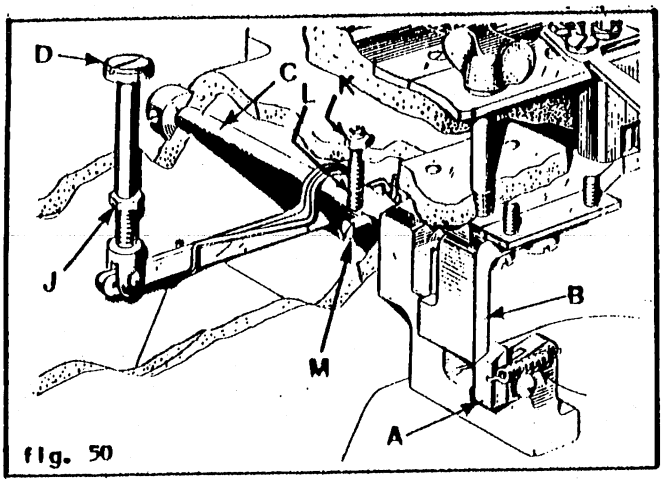


fig. 50

To check the following adjustments, the machine must be cranked to the point where the stitching ends and the race faces rearward. The stitch wheel will be locked. Continue to crank slowly until the operation of the actuator can be observed.

TRIMMING KNIFE ADJUSTMENT

The knife should be set so that it clears the underside of the throat plate and the top of the right spreader stop. The tip of the blade should extend rearward to coincide with the rear face of loopers so that it will pass by the needle without striking it. To adjust, loosen screw (G) and move knife holder up or down as necessary.

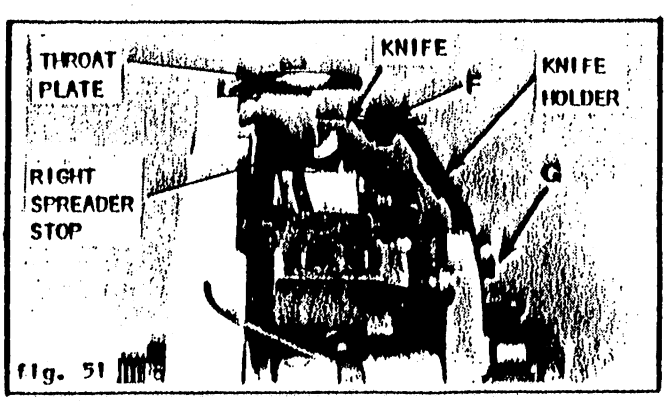


fig. 51

ACTUATOR ADJUSTMENT

With actuator fully extended, there must be slight clearance between the underside of the actuator (D) and the trimmer operating arm (H).


fig. 52

When the actuator has, of its own action, fully depressed the end of the trimmer holder (H), the extreme point of the knife should be in line with the eye looper. Further travel of the knife may cause the lower looper thread to be trimmed. To adjust, loosen nut (J) and turn actuator up or down as necessary. The actuator must operate freely at all times.

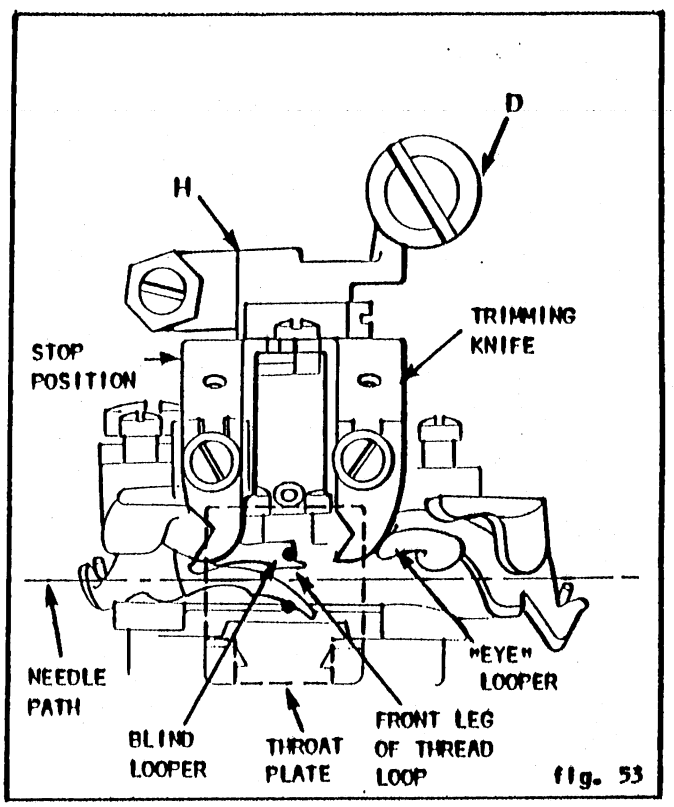


fig. 53

KNIFE STOP POSITION

The stop position of the trimming knife governs the extent of movement at the point of trimming. The cutting edge of the knife should advance sufficiently beyond the shoulder of the blind looper to assure full engagement and constant trimming of the front leg of the thread loop.

When the actuator (D) has risen to its full height, the knife should be, at MINIMUM, in an advanced position to clear the slot in the throat plate. To adjust, loosen nut (K) and turn screw (L) counterclockwise for MAXIMUM movement while maintaining some clearance between the underside of the actuator (D) and trimmer operating arm (H).

UPPER THREAD DRAW-OFF

On Cut-After machines, a thread draw-off cam, turning with the upper sector shaft, pivots the rocking tension assembly forward while the race is turning to form the eye. When the stitching ends, the race reverses, allowing the rocking tension to fall back and release additional slack thread for starting the next buttonhole.

On Cut-Before machines, the cycle ends with the race still facing backward and the tension assembly rocked forward. At the beginning of the next buttonhole, the race turns immediately. The tension rocks backward and additional slack starting thread is provided.

To obtain MAXIMUM starting thread, stop the machine at any point after the eye has been completed and while stitching the second side of the buttonhole.

Loosen two screws (A) and position the thread draw-off cam so that the rod (B) is at the top of the rise. To decrease the amount of thread draw-off, adjust the position of the cam as required in the direction of arrow marked 'less'.

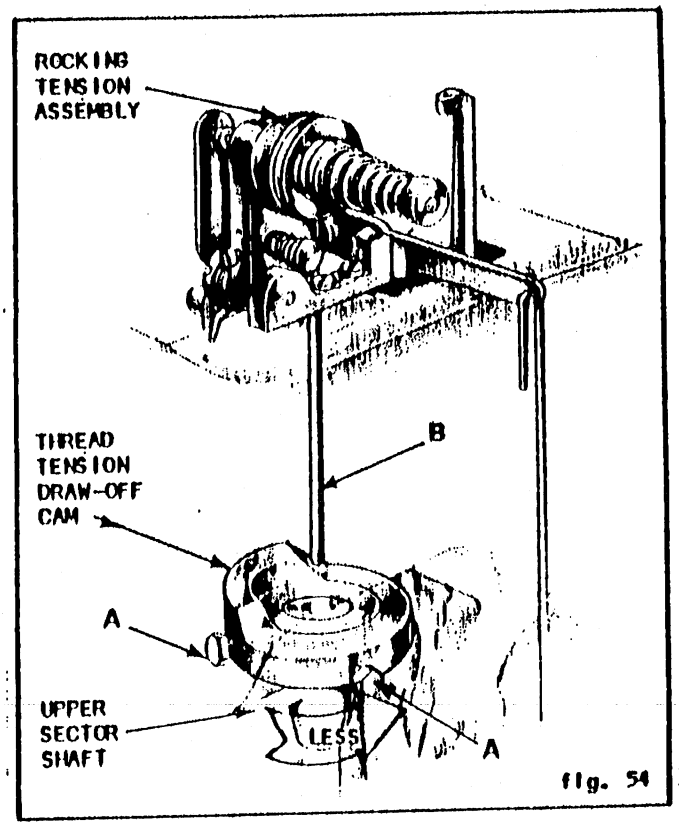
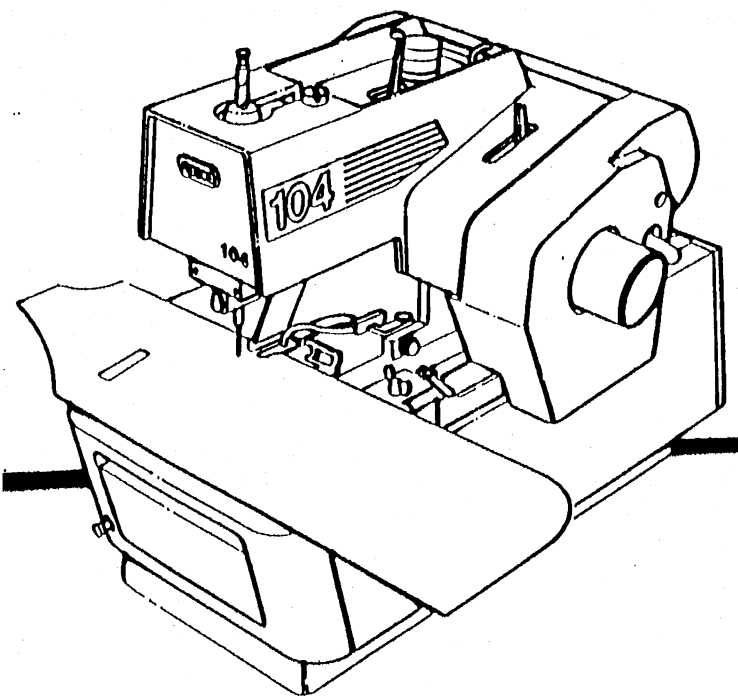


fig. 54

REECE®

BUTTONHOLE MACHINES

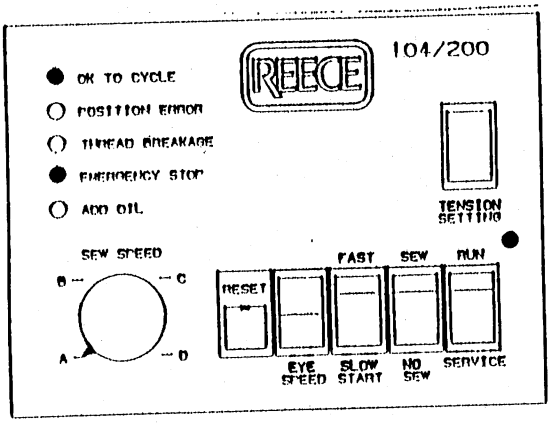
series 104-200



Section 2

TROUBLE SHOOTING

Control Box Indicator Lights



Any time after turn on — Run/Service to Run

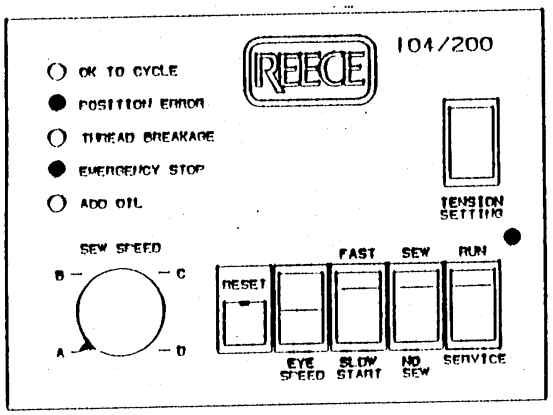
Status: OK to Cycle, Run, Emergency Stop and Reset lights are on.

Cause: Emergency Stop has been triggered.

Solution:

Press Reset once to activate Stitch Brake lockup of needle.

- Emergency Stop and Reset lights should start flashing.
- If not, check foot pedal assembly; it may be unplugged.



Any time after turn on — Run/Service to Run

Status: Position Error, Run, Emergency Stop and Reset lights are on.

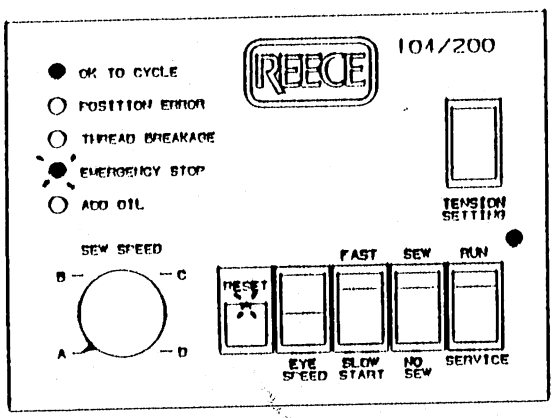
Cause: Emergency Stop has been triggered, and Stitch Brake is off.

- Needle is not in proper up position.

Solution:

Rotate needle to proper up position. Position Error light will go off, and OK To Cycle light will come on.

- Press Reset once to activate Stitch Brake lockup of needle.
- Emergency Stop and Reset lights should start flashing.
- If not, check foot pedal assembly; it may be unplugged.



Any time after turn on — Run/Service to Run

Status: OK To Cycle and Run lights are on.

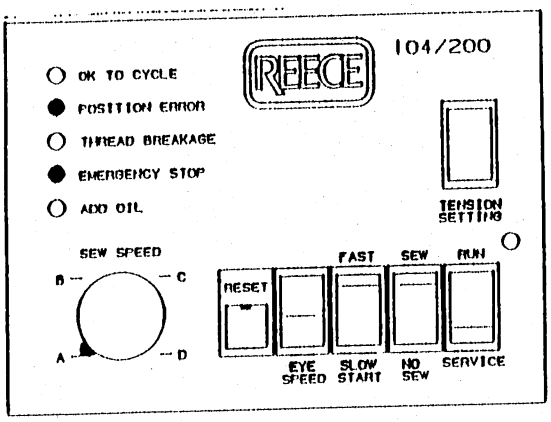
Emergency Stop and Reset lights are flashing.

Solution:

Start Sew lever will be active if you stopped before or during the sew cycle. If you stopped after the sew cycle, the Start Sew lever is inactive.

Press Start Sew lever to continue sew cycle.
Or, press Reset to send bedplate to Home position.

Control Box Indicator Lights



Any time — Run/Service to Service

Status: Position Error, Emergency Stop and Reset lights are on.

Cause: When Run/Service switch is set to Service, power is removed from the Stitch Brake, Stitch Clutch, and the Main Clutch for safety, and machine is put into Emergency Stop.

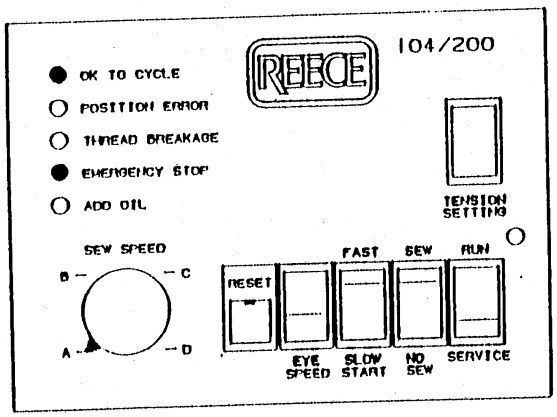
- Needle is not in proper up position, and Stitch Brake is off.

Solution:

Return Run/Service switch to Run position; the Run light will come on.

Rotate needle to proper up position. The Position Error light will go out and the OK To Cycle light will come on. Remove garment from machine.

- Always press Reset twice to send bedplate to proper home position before trying to perform a sew cycle.



Any time — Run/Service to Service

Status: OK To Cycle, Emergency Stop and Reset lights are on.

Cause: When Run/Service switch is set to Service, power is removed from the Stitch Brake, Stitch Clutch, and the Main Clutch for safety, and machine is put into Emergency Stop.

- Needle is in proper up position and Stitch Brake is off.

Solution:

Return Run/Service switch to Run position; the Run light will come on. Remove garment from machine.

- Always press Reset twice to send bedplate to proper home position before trying to perform a sew cycle.

TROUBLESHOOTING GUIDE

Flashing Display Readout

1

During cycle.

- Problem: First stitch sensor has been detected bad.
- Solution: Check head harness for cut wires.
  Replace sensor.

2

During cycle.

- Problem: Last stitch sensor has been detected bad.
- Solution: Check head harness for cut wires.
  Replace sensor.

3

At turn on and start of a cycle.

- Problem: Start sew switch has been detected bad.
- Solution: Readjust start sew switch.
  Check head harness for cut wires.
  Replace switch assembly.

4

At turn on and start of a cycle.

- Problem: Reset switch on control box has been detected bad.
- Solution: Check to make sure it is not stuck in.
  Replace control box.

5

During a sew cycle.

- Problem: First stich sensor has been detected bad.
- Solution: Check gap between sensor and trigger block. It should be .015" or less.
  Replace sensor.

6

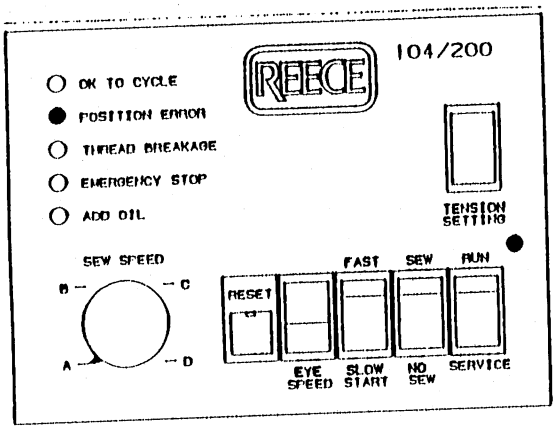
During a sew cycle.

- Problem: Last stitch sensor has been detected bad.
- Solution: Check gap between sensor and trigger block. It should be .015" or less.
  Replace sensor.

During initial bedplate travel.

- Problem: Home sensor has been detected bad.
- Solution: Check gap between sensor and bedplate.
  Replace sensor.

Control Box Indicator Lights



At turn on — Run/Service to Run

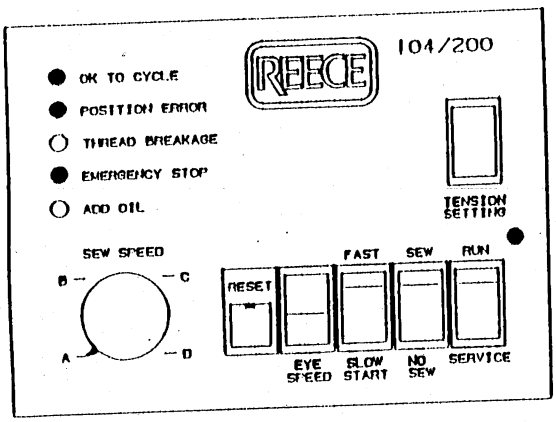
Status: Position Error light and Run light are on.

Cause: Needle is not in proper up position at turn on.

Solution:

Rotate needle up by hand until needle is in proper position.

- Position Error light will go out and OK To Cycle light will come on.
- Stitch Brake will lock needle in up position.



At turn on — Run/Service to Run

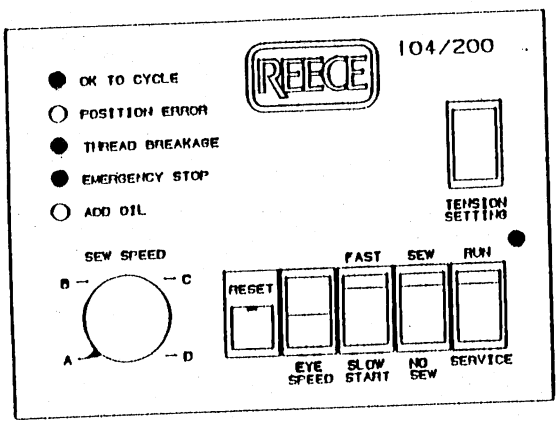
Status: OK To Cycle, Position Error, Emergency Stop, Reset, and Run lights are on.

Cause: Bedplate is not in home position.

Solution:

Press Reset button once.

- Bedplate will cycle to proper Home position.



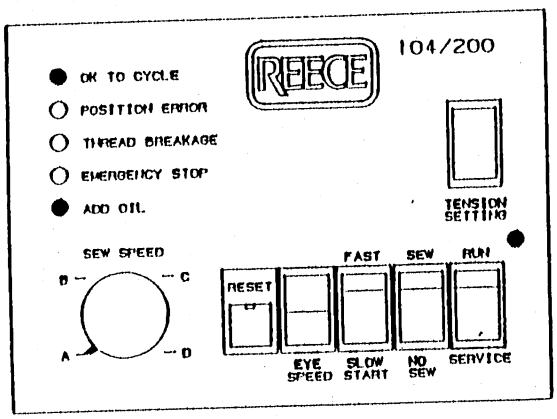
Any time — Run/Service to Run

Status: OK To Cycle, Thread Brakage, Emergency Stop, and Reset lights are on.

Cause: Upper thread breakage during sewing.

Solution:

Rethread machine and reset Reset.



Any time — Run/Service to Run

Status: OK To Cycle, Run, and Add Oil lights are on.

Cause: Oil reservoir needs filling.

Solution:

Oil machine and fill reservoir.

- Add Oil light will go out, and machine will be ready to cycle.

ADJUSTMENTS SPECIAL TO CORD TRIM MODELS

HOLD DOWN FINGERS

The hold down fingers function is to hold the work while cutting of the thread and gimp takes place.

To adjust pressure of material or work piece, loosen nut (A) and adjust screw (B) to obtain desired pressure. Pressure on material or work piece should be sufficient to hold material but not too much to bind machine.

Height of hold down finger can be adjusted by loosening nut (C) and turning screw (D) to obtain proper height.

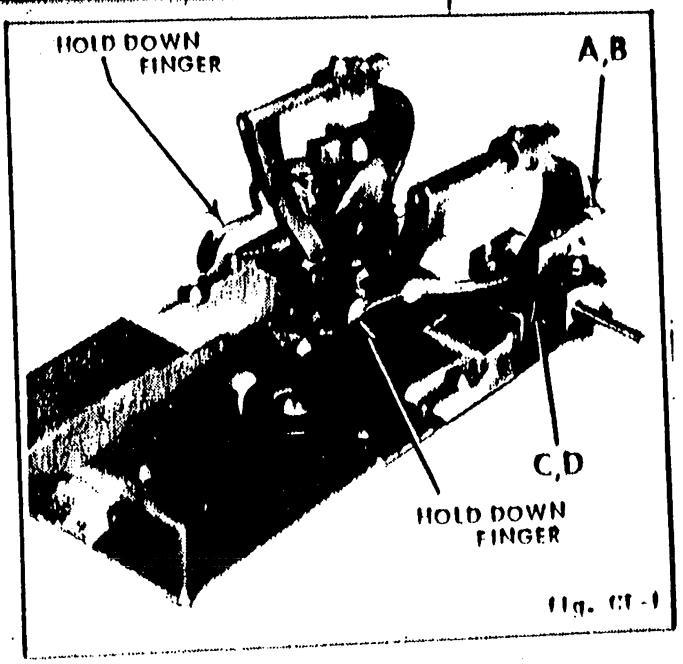


Fig. CT-1

THREAD TRIMMER AND THREAD RETAINER

Upper thread trimmer is activated by a wedge located on the main cam. Movement of the thread trimmer should be delayed as late as possible to allow the thread pickup hook to be in position to pick up trimmed top thread.

The upper thread knife should be set to clear the front of the needle and the bottom of the throat plate. Also check that the knife clears the top of spreaders.

The knife should be installed and adjusted so that it trims thread on the return stroke.

The thread retainer in its home position should be to the right of the thread slot. It should be set lightly against the front of the throat plate by adjusting screw (E), Fig. CT-3.

As the trimmer/retainer is activated, the thread retainer wipes across the thread slot and captures thread for the next cycle.

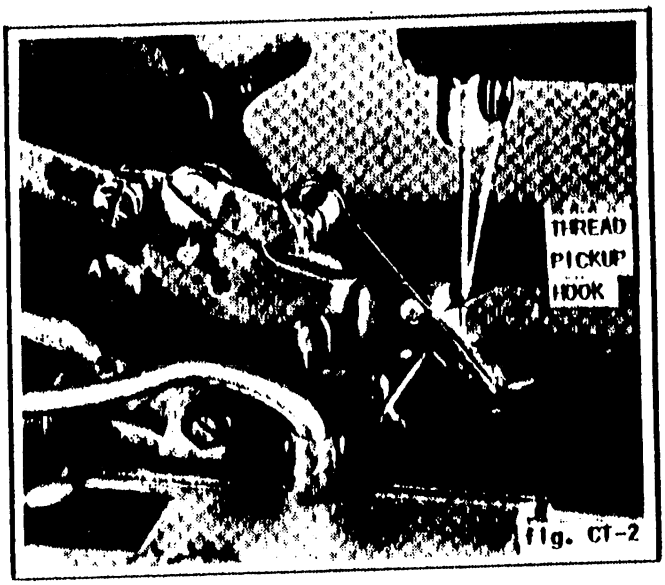
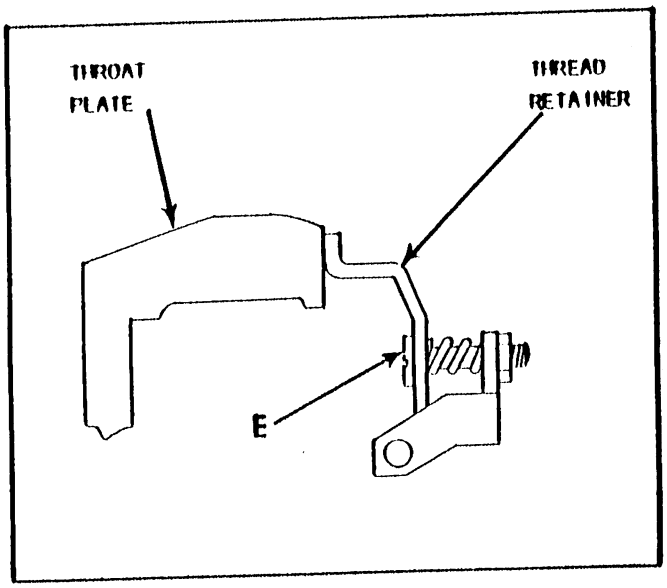


Fig. CT-2



ADJUSTMENTS SPECIAL TO CORD TRIM MODELS

OP THREAD PICK-UP

he thread pick-up hook is actuated by the lownward movement of the cutting lever.

land crank machine through its entire cycle and observe thread pick-up hook as it makes its lownward plunge. Pick-up hook should not hit clamps or material. To adjust, loosen pivot screw (E) and swing plate (F) on its fulcrum (G) to obtain desired results. Retighten pivot screw (E).

Center 'V' of thread pick-up hook should line up with needle center line. This adjustment is made by bending the thread pick-up hook left or right with a pair of long needle nose pliers.

fig. CT-4

GIMP PULL BACK

A gimp pull back is provided to insure that there is enough gimp to start the next buttonhole.

Spring (H) acts as a clamp and tension on gimp. To adjust, remove yoke (J) by pressing inward on pin (K).

Adjust spring (H) by loosening screw (L) and position spring (H) until its top edge is slightly under top of gimp hole. Gimp should slide through hole, but without being able to move back.

Weight (M) pulls gimp back through hole in throat plate at the end of cycle. To adjust length of starting gimp, loosen screw (N) and adjust stop (P) to obtain desired results.

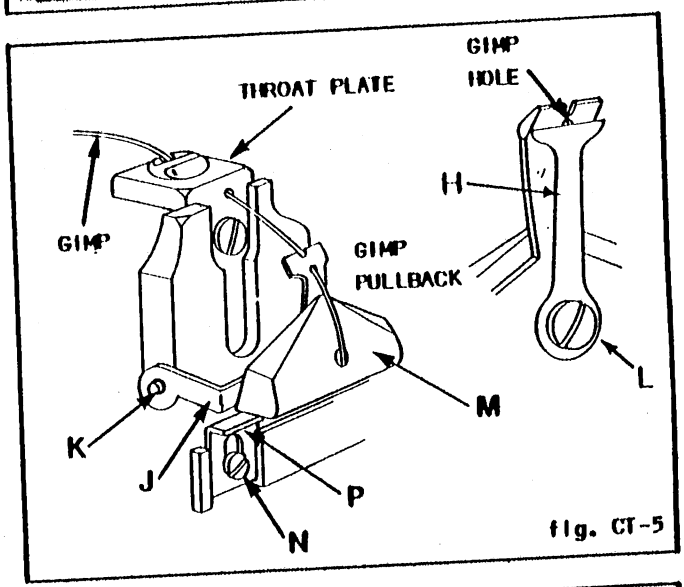


fig. CT-5

STITCH INCREASE WEDGE

The stitch increase wedge is used to add or remove stitches in the buttonhole eye. Loosen screw (R) and move wedge forwards towards front of machine for additional stitches and toward the rear for less stitches.

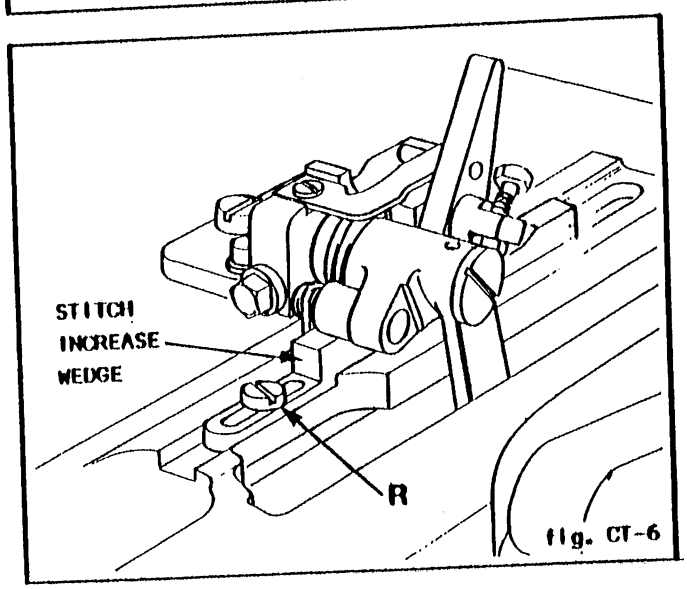
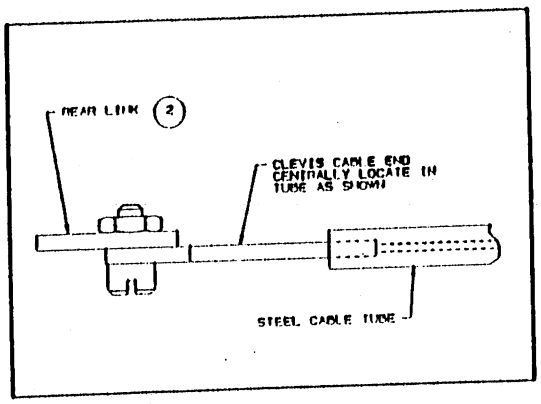


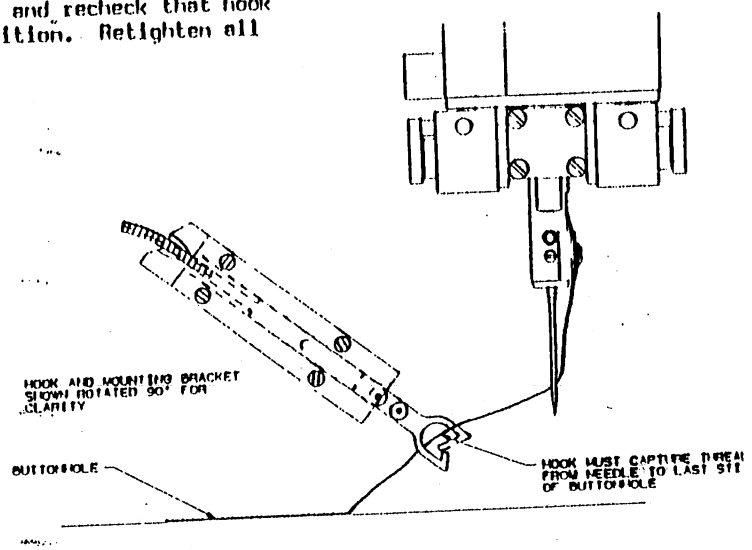
fig. CT-6

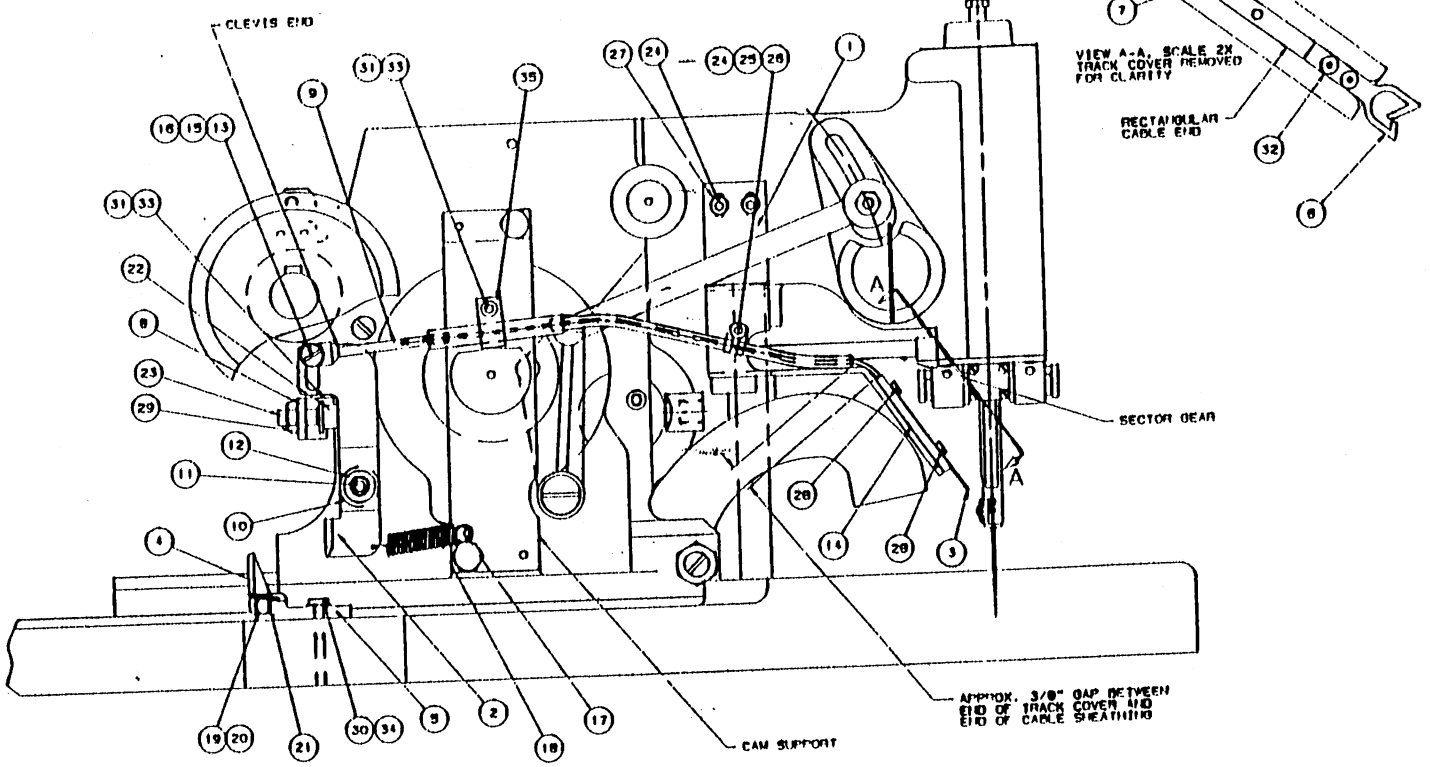
CB TOP THREAD PICK-UP ADJUSTMENTS

15. Sew a sample buttonhole and stop at the last stitch position. Hand crank machine to activate pick-up mechanism and observe that the hook captures the top thread running from the eye of the needle to the sewn buttonhole. Adjust the front bracket to line up the centerline of the hook to the thread, and adjust the position of the clevis on the rear link for proper stroke. The stroke should be adjusted so the thread passes behind both legs of the hook as shown and can not escape. Adjust the clevis up on the rear link for more stroke, down for less. Excessive stroke will drive the pick-up hook into the garment and cause hook breakage.

16. Recheck all screws for tightness and sew a few buttonholes to observe operation of pick-up mechanism. Readjust stroke and position as necessary to achieve consistent thread pick-up and recheck that hook does not contact track guides in retracted position. Retighten all screws.







CB TOP THREAD PICK-UP ADJUSTMENTS

NOTE: Before installing cable, a coating of grease should be applied to exposed areas of cable and injected inside cable sheathing.

1. Install track guides (7), shim (14) and track cover (3) as shown to the mounting bracket (1) (14-6001-0-000). Adjust the track guides so the rectangular cable end can freely travel complete length of guides without any binds. Tighten screw (28).

2. Leave rectangular cable end in the mounting bracket asm. and extend it far enough out of mounting bracket so that the pick-up hook (6) can be installed. Check that the hook mounting screws (32) do not protrude through backside of cable end. If they do, they must be filed off.

3. Pull on the clevis end of the cable so that the hook retracts under the track cover. There should be a slight drag to .005 clearance between the hook (6) and the track cover (3). This will trap the thread between the hook and cover, retaining it for the next cycle. To adjust, slightly bend the track cover up or down as necessary. Install front cable clip (26) to front bracket (1) and adjust cable so that there is approximately a 3/8" gap between the end of the cable sheathing and the back of the track cover.

4. Install the front bracket/cable asm. to the head of the machine as shown and adjust the bracket so that as the sector gear swings to the left, the gear just clears the top of the cable sheathing. Adjust and securely tighten the mounting screws.

5. Install rear link (2) and stop bracket (8). Tighten all screws securely. Install stop screw (23) and nut (29) to stop bracket, but do not tighten at this time.

6. Mount cable clevis to rear link using shoulder screw (13) provided. Position clevis about midpoint of slot in rear link and tighten shoulder screw.

7. Mount tube clip (35) to cam support, but do not tighten screw at this time.

8. Look down from the top of the machine. Check that clevis is centrally located in the tube as shown. Bend the rear link (2) as necessary to centralize clevis.

9. Adjust retracted position of cable by adjusting the stop screw (23) so that the pick-up hook (6) does not contact the track guide (7) when the cable is fully retracted. Adjust the stop screw in or out as necessary and tighten locking nut (29). Failure to properly set retracted position will cause breakage of the hook.

10. Actuate cable asm. by rotating rear link (2). Notice how clevis end enters the cable tube. Position the tube on the cam support so that the clevis enters and retracts from the tube without hitting the sides and the cable operates freely. Tighten the mounting clip (35) securely.

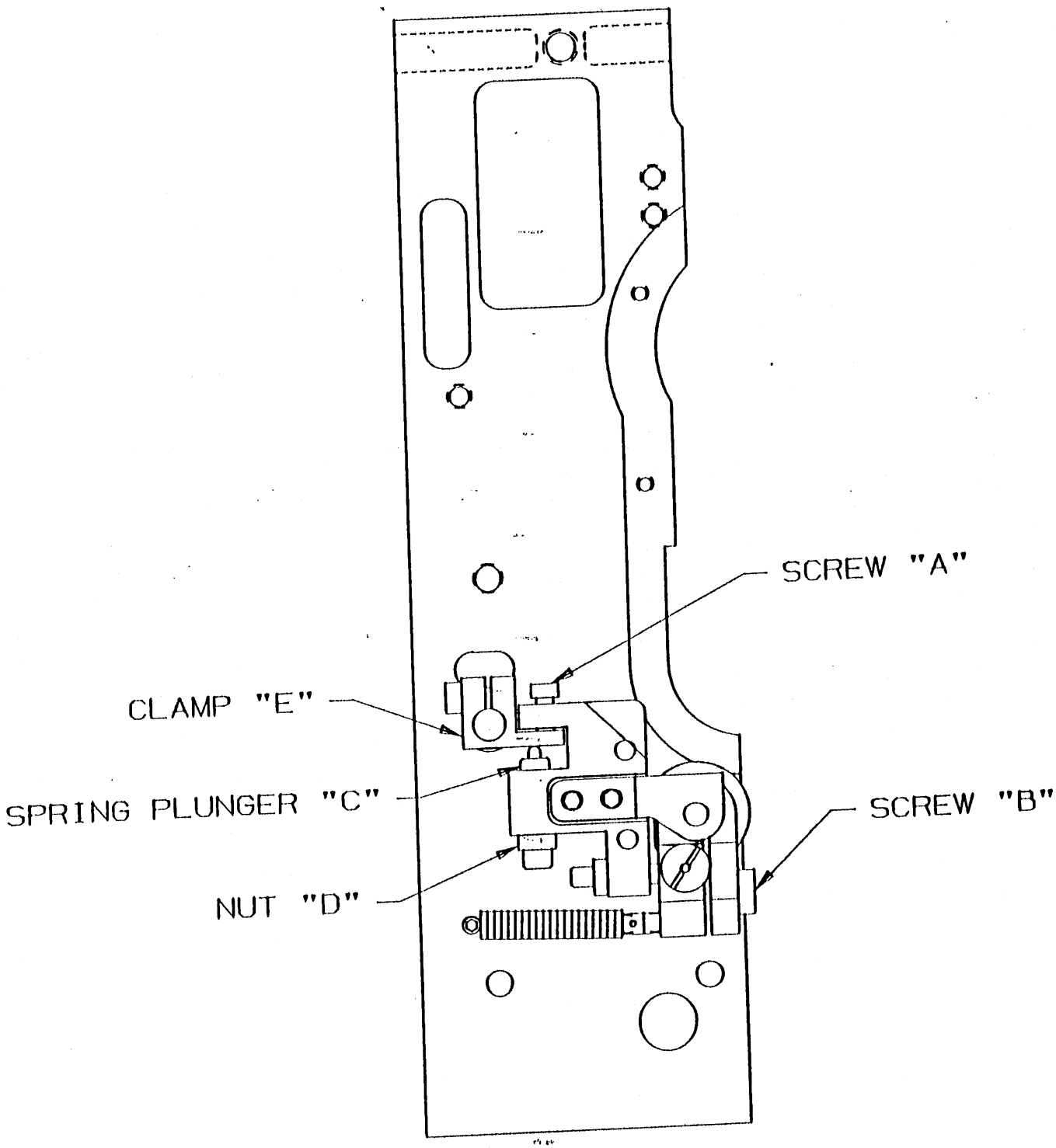
11. Attach return spring (18) to rear link (2) and cam support. Apply a few drops of lightweight oil to all pivot points.

12. Actuate pick-up mechanism a few times to make sure that it operates freely and returns to the stop position without any binds. Recheck that the hook (6) does not hit the track guides (7).

13. Install the actuator (5) to the bedplate with hardware provided, but do not tighten screw (30) at this time.

14. Hand crank machine through cycle and stop at the last stitch position. Adjust the actuator (5) on the bedplate so that it just contacts mating face on the rear link (2). Tighten actuator screw (30). Continue hand cranking through cycle and observe the release of the top thread trimmer knife. The pick-up hook should be fully extended before the trimmer knife releases and then returns within 1/8" additional bedplate travel after the top thread is trimmed. Adjust the position of the actuator (5) on the bedplate to achieve proper timing.

ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER



ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

CAUTION - Only recommended T/Ps, P/N 14-4012-0-025 and 14-4012-0-026 can be used with the L.T.T. mechanism; use of any other T/P may result in machine damage.

L.T.T. Trimmer Knife Adjustments

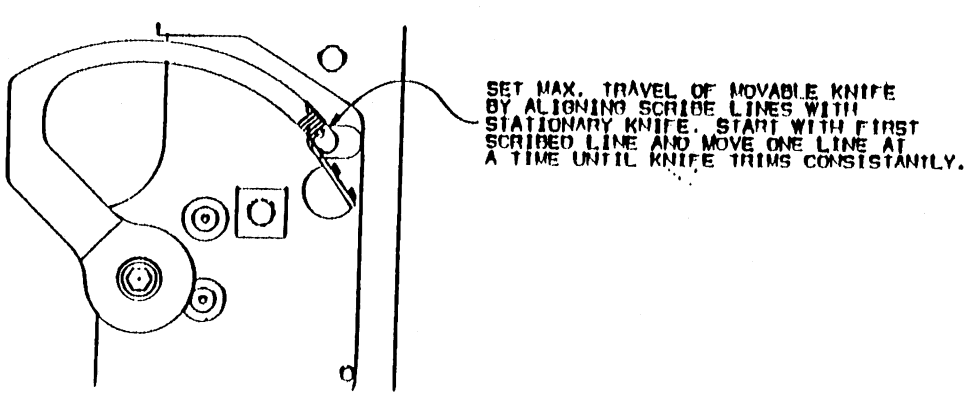
1) Remove RH clamp plate from machine and rotate movable knife until it contacts stationary knife. The stationary knife is held in position by spring plunger 'C'. Be sure that the spring plunger is not bottomed out against clamp 'E'. Loosen nut 'D' and adjust the spring plunger so that its tip is in contact with clamp 'E' but not bottomed out. Retighten nut 'D'.

   As the movable knife contacts the stationary knife, there should be 1/64 to 1/32 movement of the stationary knife. Adjust screw 'A' as necessary to achieve this. Excessive contact between the two knives causes the stationary knife to bounce and not trim. Note: Recheck that the spring plunger 'C' is not bottomed out as instructed above after setting the contact between the knives.

Movable Knife Trim Position

2) Re-install the RH plate and manually cycle the machine through one buttonhole cycle until the movable knife just starts to move, very slowly continue cycling the machine and stop when the movable knife has moved to its furthest position. This position should be adjusted by loosening screw 'B' and rotating the movable knife until the stationary knife lines up with the first scribe line on top of the movable knife. Retighten screw 'B' and bring machine to home position. Sew a sample buttonhole. If the knives fail to trim, re-adjust the movable knife as above, but line up the stationary knife with the second scribe line. Re-tighten screw 'B' and sew another sample. Continue the above procedure (moving one scribe line at a time) until the knives trim consistently. This type of adjustment is required to compensaate for the 'overthrow' of the moveable knife when operating under power.

3) Care must be taken that the movable knife does not contact either the throat plate or clamp plate at any point during the cycle.



ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

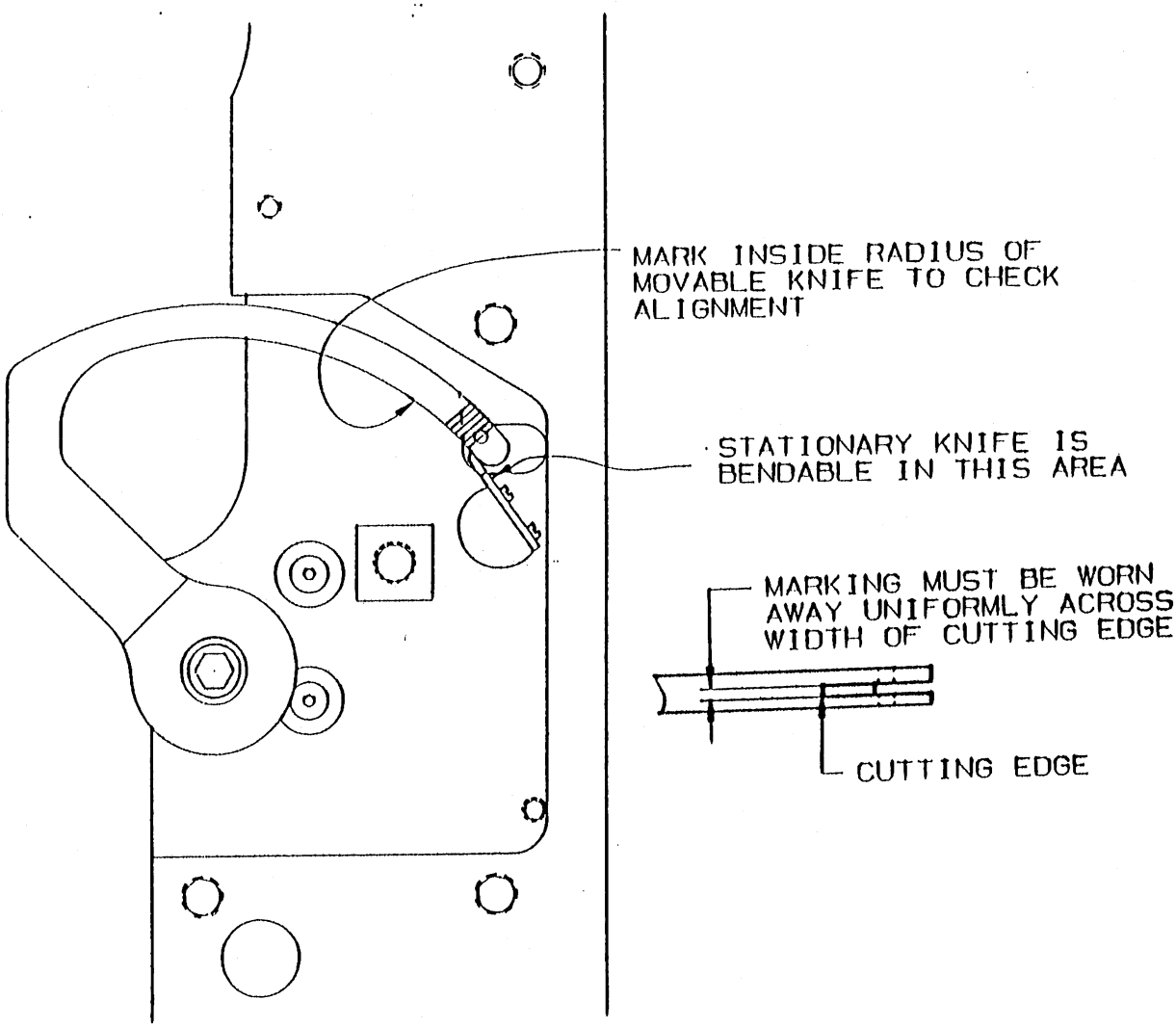
Knife Adjustment

In order to trim properly when replacing any knives, it may be necessary to align the movable knife and the stationary knife cutting edges.

To align knives:

Remove the R.H. clamp plate from the machine and remove its cover plate.

Mark the inside radius of the movable knife with steel blueing, marker or pencil in the area of the cutting edge. Rotate the movable knife until it contacts the stationary knife and their cutting edges pass over each other. Repeat this procedure a few times until the marking on the movable knife starts to wear off. The marking should be worn off uniformly across the width of the cutting edge. If not, note which way the stationary knife must be bent to achieve this. The stationary knife is bendable in the area behind the welded on cutting edge as shown below. Repeat the above procedure until the movable knife's and the stationary knife's cutting edges fully contact each other.



Setting of the Movable Knife Return Actuator

The movable knife return actuator works as a positive drive to completely separate the movable knife from the stationary knife until the return spring can pull the movable knife to its rest position.

To adjust:

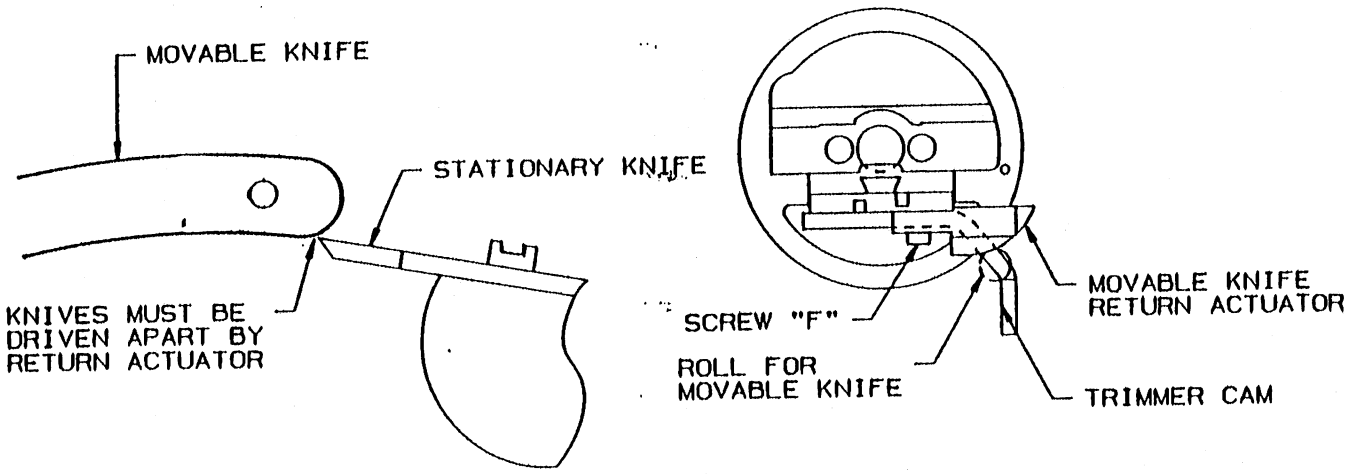
Loosen screw 'F' and leave return actuator loose. Turn machine by hand through buttonhole cycle, stopping during the trimming portion. Slowly continue cranking machine, making sure there is clearance between the return actuator and trimmer cam for roll on the movable knife actuator to pass through. Slide return actuator as necessary to gain clearance, and retighten screw 'F'.

Excessive Clearances

The return actuator must positive drive the movable knife away from the stationary knife as shown below.

To adjust:

Cycle machine by hand through trimming cycle and note how far the return actuator drives the movable knife away from the stationary knife before the spring returns it to its rest position. Adjust return actuator to positively drive the knives apart before the spring works. Failure to maintain this setting could result in the movable knife remaining in contact with the stationary knife and cause damage to the throat plate and race at the start of the next buttonhole cycle.



ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

Thread Draw-Off Adjustments

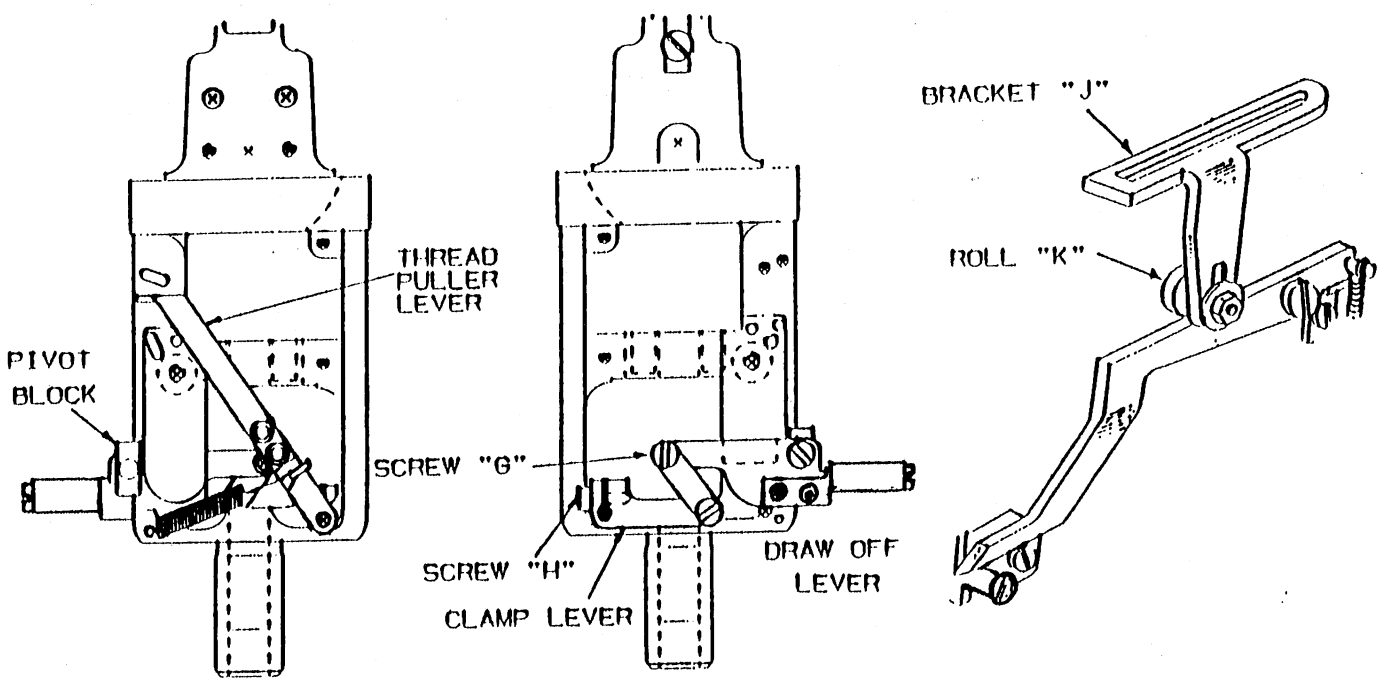
Remove screw 'G' from draw-off linkage. Adjust pivot block so that the tension discs open before the draw-off lever travels 1/16". Re-install screw 'G' and check for free movement on draw-off mechanism. If any bind exists, loosen screw 'H' and allow clamp lever to move away from race. (Note: thread puller lever must be held against race during this adjustment.) Retighten screw 'H' and check for free movement.

The LTT mechanism requires the maximum amount of thread be drawn off before the trimming knife activates to prevent distortion to the buttonhole.

To adjust:

Cycle machine by hand until thread draw-off mechanism fully activates, noting the furthest position of the draw-off lever. It should fully travel across the width of the race as shown below. It is achieved by adjusting roll 'K' on bracket 'J'.

The draw-off mechanism should activate as late in the machine cycle as possible, but return to its relaxed position before the race turns to activate the trimming knives. This is achieved by adjusting bracket 'J' on the bedplate.



ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

Movable Knife Position

Remove RH clamp plate from the machine and top cover. Loosen screw (A, Fig. 1) and rotate movable knife so that the point of the knife is in line with the stationary knife set screw, Fig. 2.

While holding this position, rotate the movable knife clamp (B) till it reaches the stop. Tighten screw (A, Fig. 1).

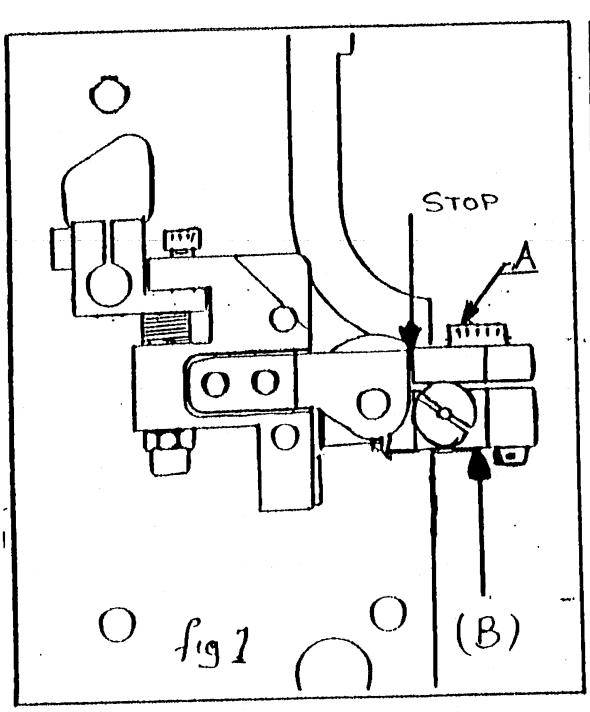


fig 1

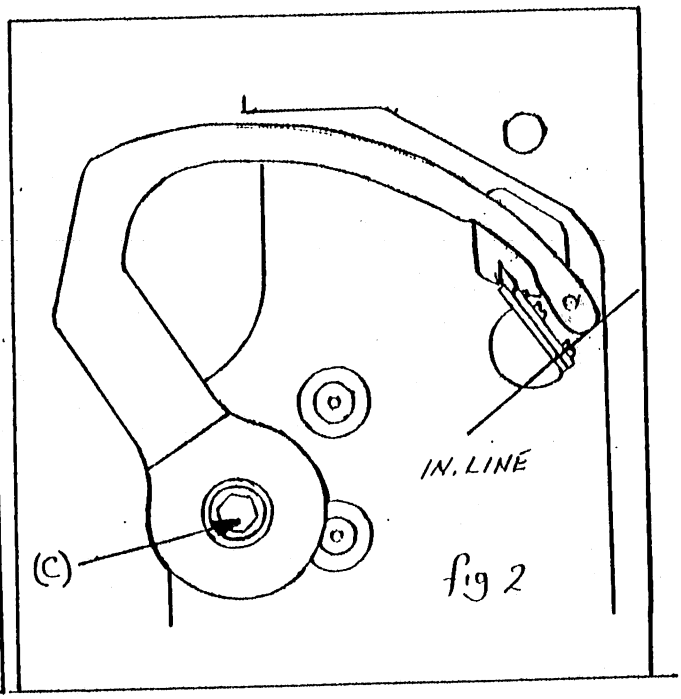


fig 2

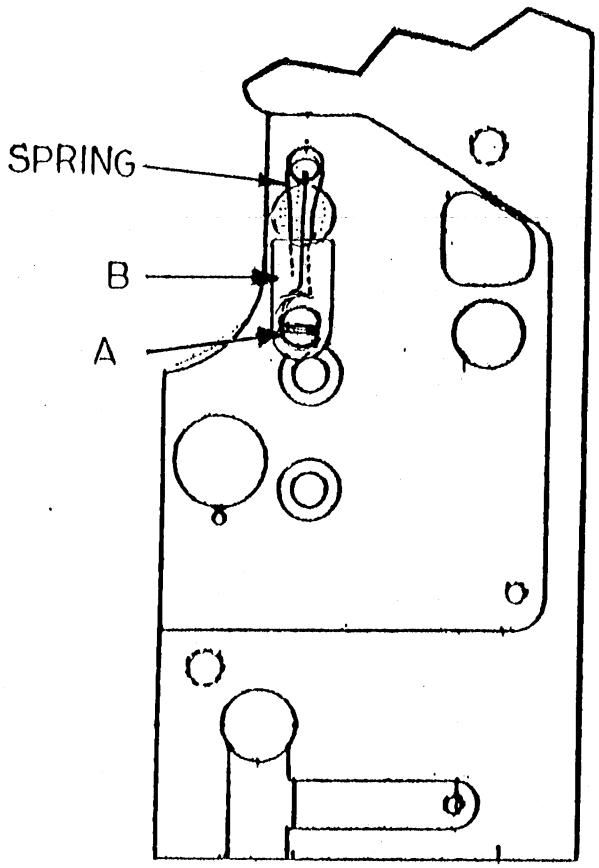
IMPORTANT: Do <u>not</u> disturb screw (C) at any time as this screw and shaft is one unit.

When replacing the movable knife, the shaft is attached to the blade.

ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

Thread and Gimp Hold Down

Depending on the type of thread and gimp size used, the amount of pressure applied to the spring is adjustable by loosening the screw (A) and moving the adj. plate (B) up for more pressure and down for less.



ADJUSTMENTS SPECIAL TO LONG TAIL TRIMMER

Stationary Knife Adjustment

Remove R.H. clamp plate from machine and remove top cover plate.

Loosen clamp screw (E, Fig.2) and rotate stationary knife assembly till the cutting edge of knife contacts the movable knife cutting edge, Fig. 1. Tighten screw (E, Fig. 2).

To increase pressure:

Loosen screw (C) a small amount; loosen nut (D, Fig. 2) and tighten screw (F); then tighten nut (D).

To decrease pressure:

Loosen nut (D), rotate screw (F) counterclockwise a small amount and tighten screw (C). Tighten nut (D).

Test pressure between the two blades by placing the looper thread and gimp in the fork of the movable knife and rotate towards stationary knife. Thread and gimp should cut clean with minimum amount of pressure.

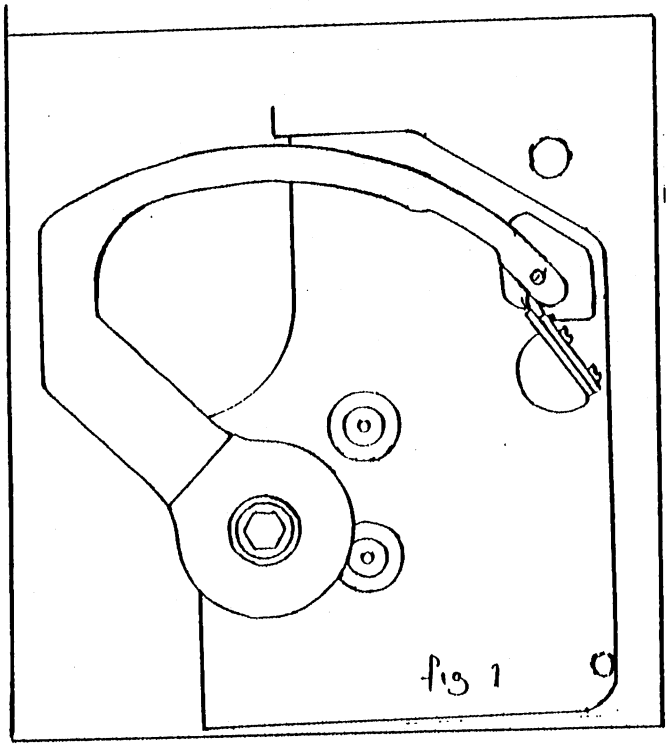


fig 1

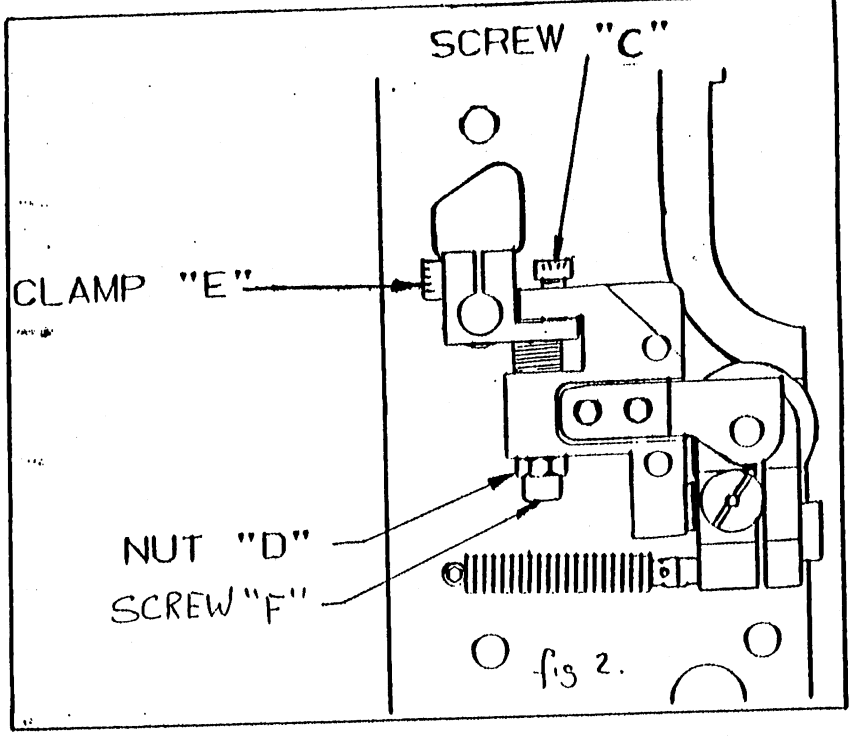


fig 2.

ADJUSTMENTS SPECIAL TO AF-CB/CA MODELS

Adjustment affecting buttonhole characteristics such as spreading, stitch bite and cutting space require no special instructions for this model. The objective is to make such adjustment satisfactory to both Cut-After and Cut-Before work going through the machine so that no further adjustments are necessary once the operator makes the changeover.

CHANGEOVER PROCEDURE

Changeover procedure is accomplished in two steps:

1. To change from CB to CA or CA to CB, loosen thumbscrew (A) and slide home sensor block forward for CA mode, back for CB mode.

2. Set clamping arm (fig. CB/CA-A) in CA or CB position. Loosen screws (D) and (E) and slide clamping arm to the rear for Cut-After operation or all the way forward for Cut-Before operation. Tighten screws (E) and then screw (D).

ADJUSTMENTS

Before making any adjustments, make sure the run/service switch on the control panel is in the service mode.

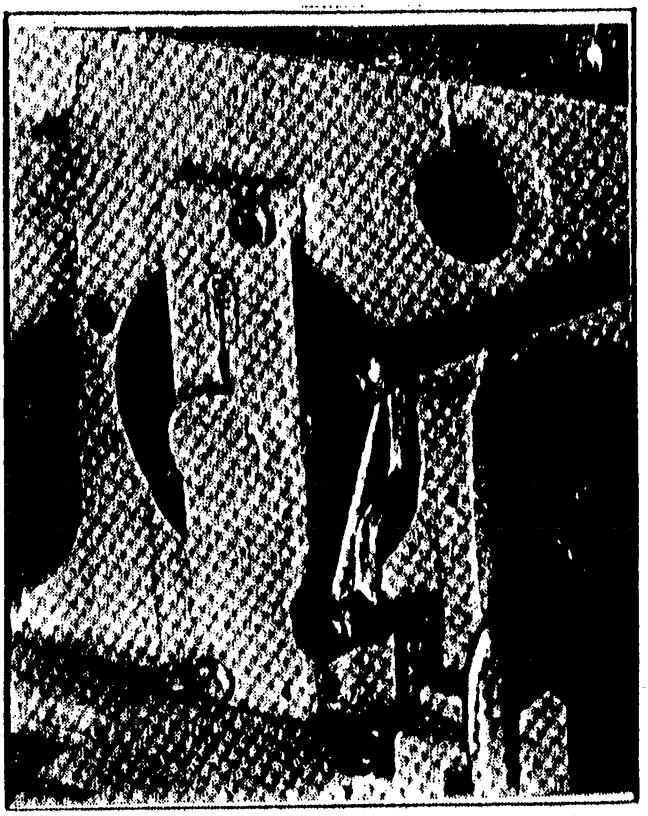
CUT-AFTER STOP POSITION

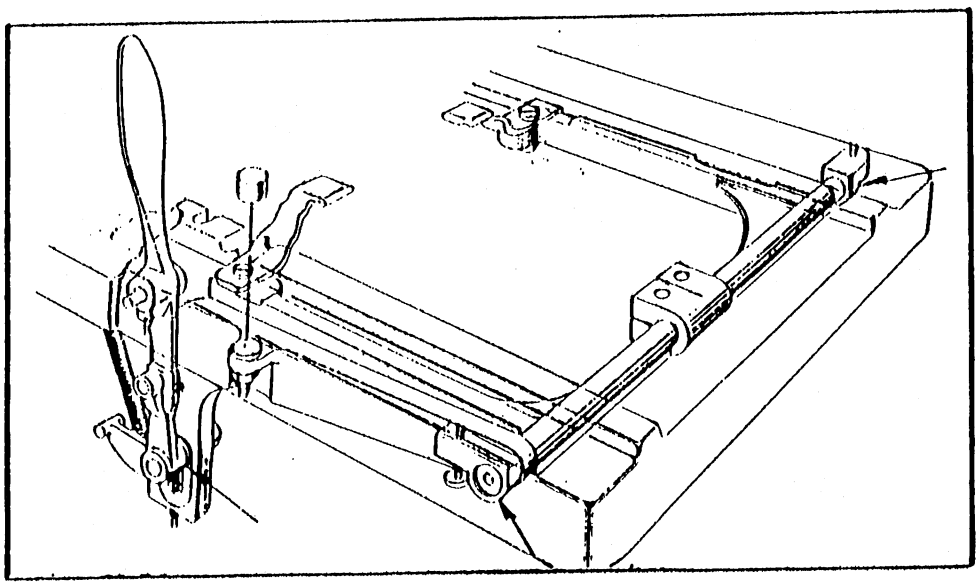
Hand crank machine until the bedplate is in the furthest rearward position. Loosen thumbscrew and slide home sensor block until light on home proximity sensor is triggered by leading edge of home sensor block. Retighten thumbscrew. Loosen CA stop and slide it forward until it contacts home sensor block. Retighten stop screw.

CUT-BEFORE STOP POSITION

Hand crank machine until the cutting lever just starts to drop. Loosen thumbscrew and slide home sensor block until light on home proximity sensor is triggered by leading edge of home sensor block. Retighten thumbscrew. Loosen CB stop and slide it up against home sensor block and retighten stop screw.

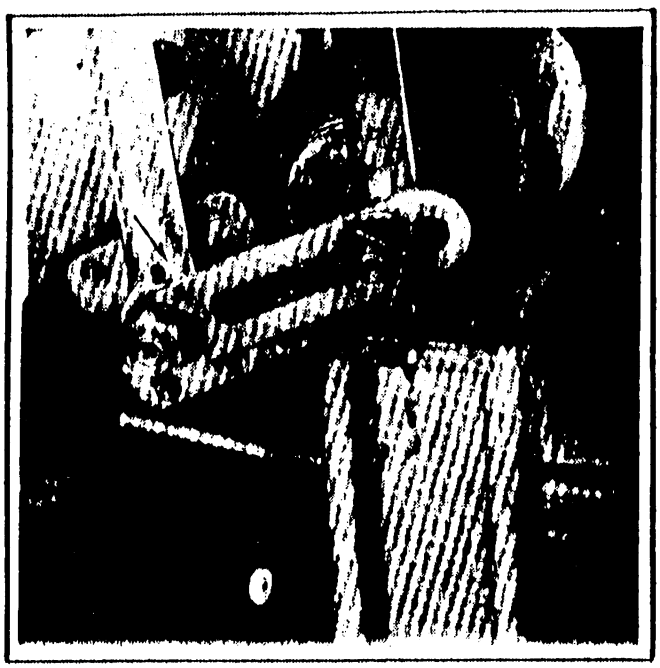
LUBRICATION

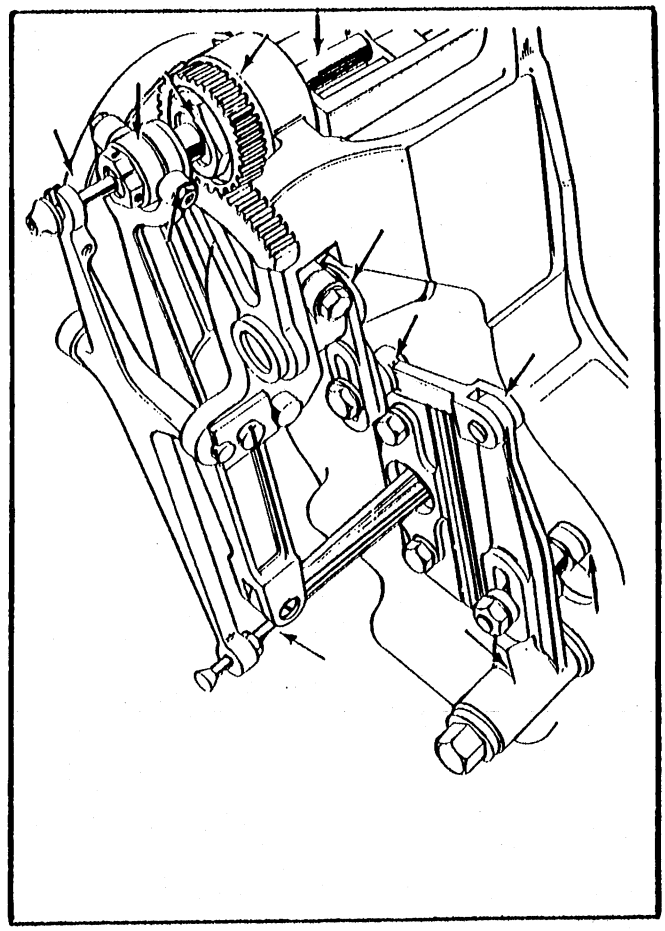


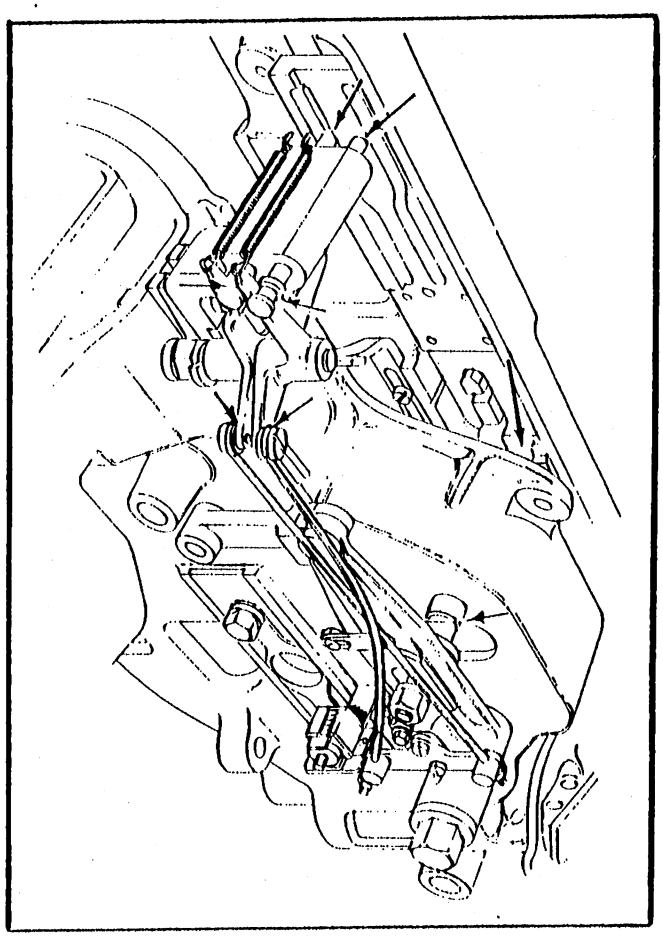


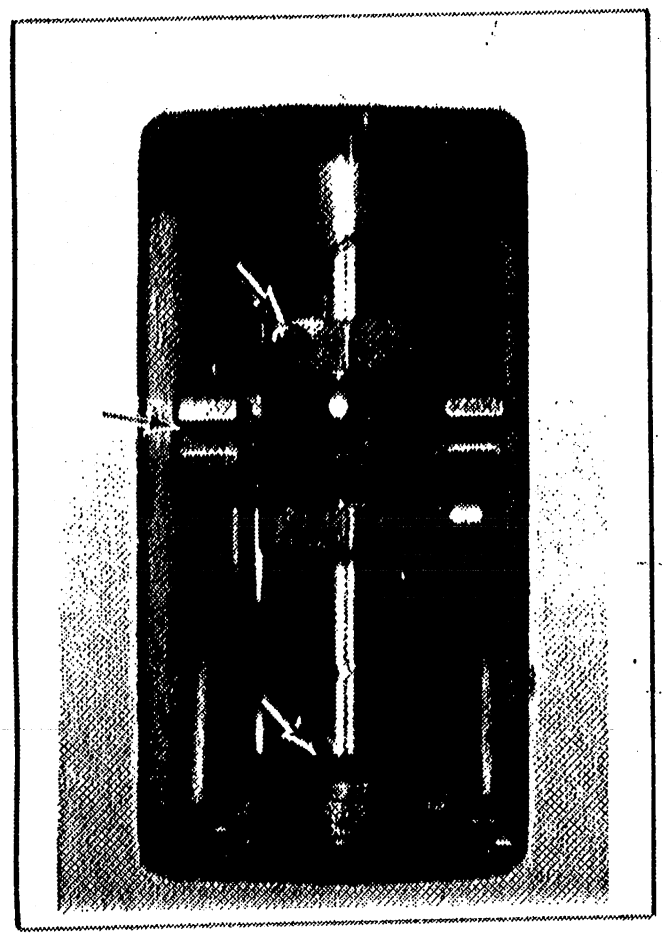
LUBRICATION

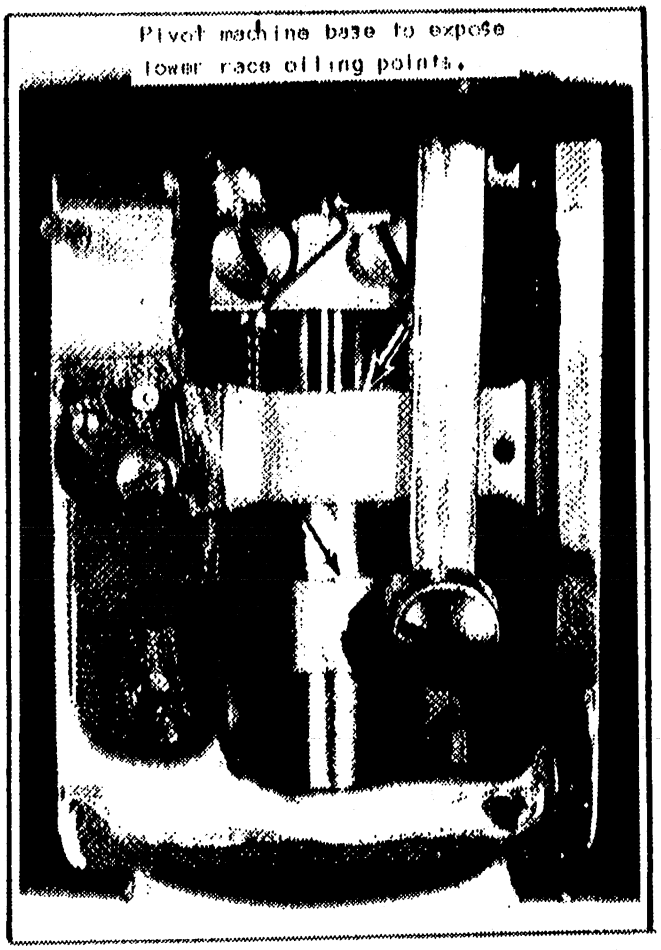
Pivot machine in base to fully raised position. This will enable lubrication of all points in the machine base. It is not necessary to remove side covers to lubricate machine.

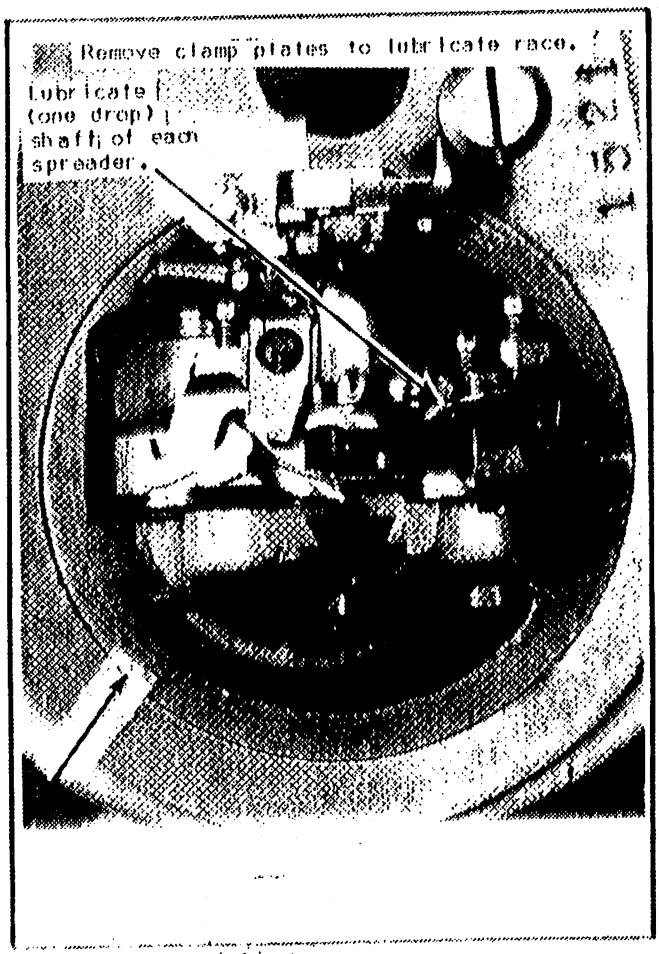









Pivot machine base to expose
lower race oiling points.


Remove clamp plates to lubricate race.
Lubricate (one drop) shaft of each spreader.