AMF® REECE

Better Ideas, Better Made

SERIES S-2000

STRAIGHT BUTTONHOLE MACHINE

PARTS & SERVICE MANUAL

PART NUMBER 97.2000.0.000

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LIMITED WARRANTY ON NEW AMF REECE EQUIPMENT

Warranty provisions:

A ninety (90) day limited service labor warranty to correct defects in installation, workmanship, or materials without charge for labor. This portion of the warranty applies to machines sold as "installed" only.

A one (1) year limited material warranty on major component parts to replace materials with defects. Any new part believed defective must be returned freight prepaid to AMF Reece, Inc. for inspection. If, upon inspection the part or material is determined to be defective, AMF Reece, Inc. will replace it without charge to the customer for parts or material.

Service labor warranty period shall begin on the completed installation date. Material warranty shall begin on the date the equipment is shipped from AMF Reece, Inc.

Exclusions:

Excluded from both service labor warranty and material warranty are: (1) Consumable parts which would be considered normally replaceable in day-to-day operations. These include parts such as needles, knives, loopers and spreaders. (2) Normal adjustment and routine maintenance. This is the sole responsibility of the customer. (3) Cleaning and lubrication of equipment. (4) Parts found to be altered, broken or damaged due to neglect or improper installation or application. (5) Damage caused by the use of non-Genuine AMF Reece parts. (6) Shipping or delivery charges.

There is no service labor warranty for machines sold as "uninstalled".

Equipment installed without the assistance of a certified technician (either an AMF Reece Employee, a Certified Contractor, or that of an Authorized Distributor) will have the limited material warranty only. *Only the defective material will be covered.* Any charges associated with the use of an AMF Reece Technician or that of a Distributor to replace the defective part will be the customer's responsibility.

NO OTHER WARRANTY, EXPRESS OR IMPLIED, AS TO DESCRIPTION, QUALITY, MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR ANY OTHER MATTER IS GIVEN BY SELLER OR SELLER'S AGENT IN CONNECTION HEREWITH. UNDER NO CIRCUMSTANCES SHALL SELLER OR SELLER'S AGENT BE LIABLE FOR LOSS OF PROFITS OR ANY OTHER DIRECT OR INDIRECT COSTS, EXPENSES, LOSSES OR DAMAGES ARISING OUT OF DEFECTS IN OR FAILURE OF THE EQUIPMENT OR ANY PART THEREOF.

WHAT TO DO IF THERE IS A QUESTION REGARDING WARRANTY

If a machine is purchased through an authorized AMF Reece, Inc. distributor, warranty questions should first be directed to that distributor. However, the satisfaction and goodwill of our customers are of primary concern to AMF Reece, Inc. In the event that a warranty matter is not handled to your satisfaction, please contact the appropriate AMF Reece office:

AMF Reece CZECH REPUBLIC
Prostejov, Czech Republic
Phone: 420 508 265 44
Fax: 420 508 360606

30-Jun-97

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INTRODUCTION

The S-2000 Buttonhole Machine, sold complete with table, motor and thread stand, can be used for work shirts, sleepwear, outer wear, and a variety of other applications.

This machine provides ***a single thread chain stitch operation*** offering the convenience of no bobbin and a single thread spool. The no-bobbin feature makes thread changes quick and easy, ensuring production stays high.

The ***patented rotary needle bar shaft drive,*** a major benefit, delivers longer needle bar life. The added benefits of lower vibration and less noise translate into less operator fatigue.

Among the seven patentable mechanisms featured on the S-2000 is a ***patented over-center clamping system*** providing smooth, even clamping on materials of varying thickness. No operator adjustment is required. ***High speed operation*** enables the S-2000 to sew straight buttonholes at up to 3800 SPM (stitches per minute), producing up to 10,000 buttonholes per 8 hour day, on average.

Simple buttonhole length adjustment from the outside of the machine eliminates the need for tiltback, while the ***quickstop repair function*** delivers safety and makes repairs easier. ***Modular construction*** facilitates speedy routine maintenance and helps keep prices low.

A Halogen work light is included with the S-2000.

The normal electrical supply requirement is 208/220/380 or 440 V.A.C., 3 phase, 50 or 60 Hz. Other electrical options are available.

SPECIFICATIONS

Productivity is a function of application, density and buttonhole length	Example: Using a 13mm (1/2") buttonhole with 40 stitches, production could be as many as 10,000 buttonholes per 8 hour day.
Speed:	3800 SPM (Stitches Per Minute)
Stitch:	Single Thread Chain (Type 101)
Recommended Thread:	Tex Size 20 to 30 (good quality polyspun or cotton)
Needle Size and Style:	AMF Reece Series 750, Size dependent upon application
Sewing Thickness:	4mm (5/32") Maximum
Buttonhole Length:	35mm (1 3/8") Maximum 6.35mm (1/4") Minimum
Available Knife Sizes:	6.35mm (1/4"), 9.65mm (3/8"), 11.2mm (7/16"), 12.7mm (1/2"), 14.27mm (9/16").19.0mm (3/4"), 15.8mm (5/8"), 22.0mm (7/8"), 25.4mm (1"), 32.0mm (1 1/4"), 35.0mm (1 3/8")
Density (number of stitches per inch):	Maximum = 30 Minimum = 10 Infinitely Adjustable
Number of Barring Stitches:	6 Each End

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SPECIFICATIONS

Bite:	Maximum 2.3mm (3/32") Minimum 1.5mm (1/16") Infinitely Adjustable
Cutting Space:	Adjustable to Application
Table Specs:	Crosswise and Parallel Styles with Pneumatic Start
Electrical:	115 V/1 ph 60 Hz, 208 V/1 ph 50/60 Hz, 220 V/3 ph 50/60 Hz. 380 V/3 ph 50 Hz 440 V/3 ph 50 Hz
Weight:	Net = 46 Kg (102 lbs.) Gross = 70 Kg (154 lbs.)
Dimensions:	Net Width = 241mm (9.5") Net Height = 337mm (13.25") Net Length = 457mm (18")
Parallel Table Dimensions:	Net Width = 60cm (24") Net Length = 110cm (43") Net Height = 71cm (28")
Crosswise Table Dimensions:	Net Width = 60cm (24") Net Length = 84cm (33") Net Height = 71cm (28")

SPECIFICATIONS

Crosswise Back Gauge Distance:	6-32mm (1/4"-1 1/4")
Parallel Back Gauge Distance:	Normal = 25mm (1") Minimum = 12mm (1/2")
Air Pressure Requirements:	PSI = 70-80 BAR = 4-5
Air Usage:	.15 cu.ft/min.
Lubrication:	Semi-Automatic (Spec oil)
Meets CE Standards:	Yes

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GENERAL OPERATING PRECAUTIONS

The S-2000 Buttonhole Machine has been carefully designed and manufactured to our high quality standards. Special attention has been focused on the convenience of operation and effective hazard protection for operating personnel.

Safety components of the S-2000 include: needle bar cover, needle break eye shield, belt guard and a number of case aluminum covers designed to protect the operator from exposure to all major operating parts of the machine.

WARNING! Any piece of equipment may become dangerous to personnel when improperly operated or poorly maintained. It is *imperative* all personnel expected to operate or maintain this equipment be familiar with the information contained in this manual.

It is recommended that AMF Reece service personnel supervise the installation and initial training of your mechanics and operators.

The most effective employee hazard protection is a rigidly enforced safety program which includes effective training in safe operating methods. Supplementary hazard protection, including guards and covers, are useful when attached in the correct manner and are properly maintained. Operators and service staff should be required to wear safety glasses.

MACHINE PRECAUTIONS

A continuous run, clutch/brake typemotor used to drive the S-2000.

When the large pedal is "toed" over and latched, the motor clutch is engaged. If the green push button switch is "ON" or pressed to "ON", the motor drive pulley will turn, delivering power to the machine's idler pulley. If the machine is **NOT** in the home position, it will cycle to the home position and stop.

When the large foot pedal is "heeled", the motor's brake is appplied and all drives will cease. even in mid-cycle.

WARNING! Before making adjustments, shut off the main power switch and dissipate the enertia left in the motor by engaging the clutch until the machine's idler pulley is completely stopped.

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OPERATING INSTRUCTIONS

Activating the Large Foot Pedal:

Delivers power to the machine drive pulley

Activating the Small Foot Pedal (by pressing it all the way down):

Drops and locks the work clamps

Starts the machine sewing a buttonhole

Cuts and trims the buttonhole

Draws off the thread

Automatically unlocks and lifts the clamps

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CONTROLS

On/Off Buttons:

Control all power to the S-2000. The green ON push button powers up the machine. When the red OFF push button is pressed, there is no power to any component.

Emergency Stop:

Heeling the large foot pedal immediately stops the machine.

Large Foot Pedal:

Heeling the large foot pedal stops the machine from sewing, but power to the motor remains on. Toeing this pedal engages the drive pulley.

Small Foot Pedal:

When pressed all the way down, the machine sews through one cycle.

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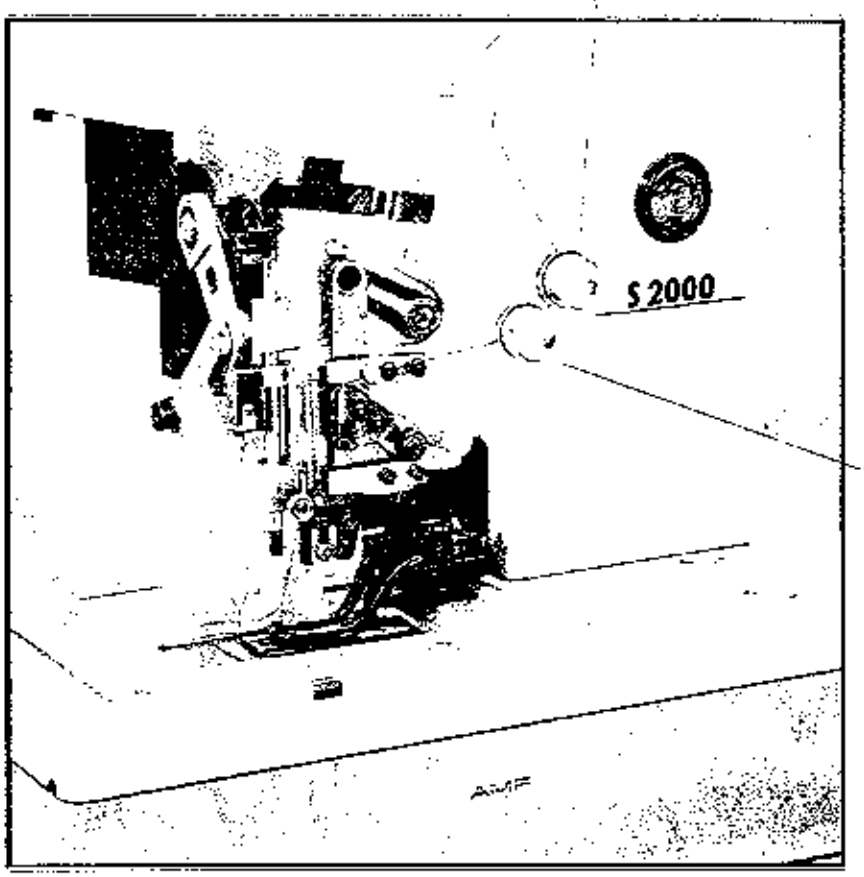
Threading the Machine

1. *Make sure* the power is **Off** and the large foot pedal is heeled back.

2. Thread the machine as shown below.



OPERATOR INSTRUCTIONS

Starting the Machine

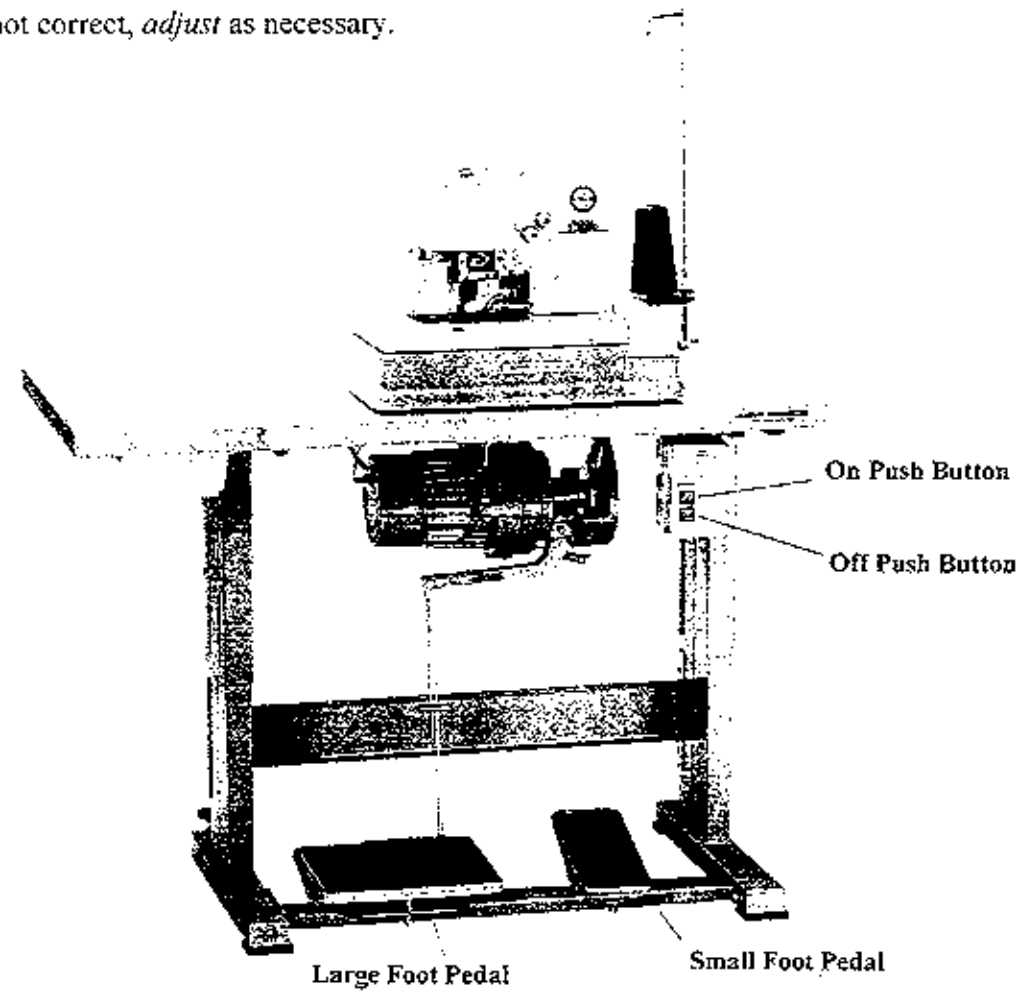
1. *Press* the green **ON** push button and toe over and latch the large foot pedal. (This makes power available to the machine and releases the brake.)

2. *Place* a piece of scrap material under the clamp feet. *Push* the hand clamping lever downward. Clamp feet will lower, holding material in place.

3. *Press* the small foot pedal all the way down to start the machine sewing. **WARNING:** ***Do Not try to hold or move the material with your hands.***

4. *Sew* several buttonholes on the material and *observe* both the regular and barring thread tensions. **Note:** Tension is correct when the bottom thread is pulled up firmly and the finished buttonhole is clean and precise.

5. If tensions are not correct, *adjust* as necessary.



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Stopping the Machine

To stop the machine in an emergency during the sewing cycle:

1. *Firmly heel* the large foot pedal.

2. *Press* the red **Off** push button.

To resume sewing:

1. *Press* the green **On** push button and *toe* the large foot pedal.

OPERATOR INSTRUCTIONS

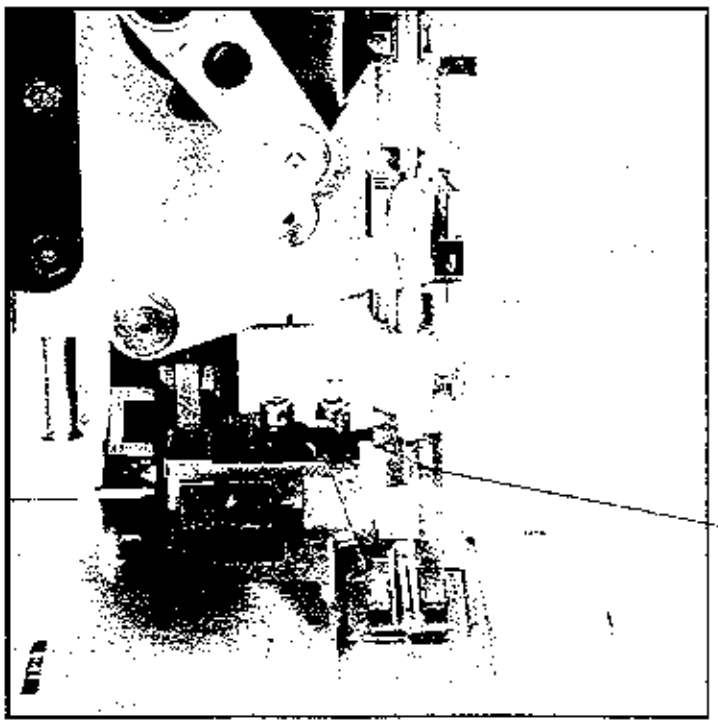
Inserting the Needle

1. *Heel* the large foot pedal and ***turn off*** the power.

2. Manually *lower* the clamps.

3. *Make sure* the needle is straight and to the highest position in the needle bar with the flat spot on the shank facing the needle screw (as shown) and the needle groove facing ***towards*** the clamps.

4. *Tighten* the needle screw securely.



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5. *Press* the green **ON** push button to turn on the power and *push* forward on the large foot pedal to engage the motor.

6. *Insert* the material under the clamps, as shown in Figure 1 for sewing buttonholes parallel to the border, or as shown in Figure 2 for sewing buttonholes crosswise to the border.

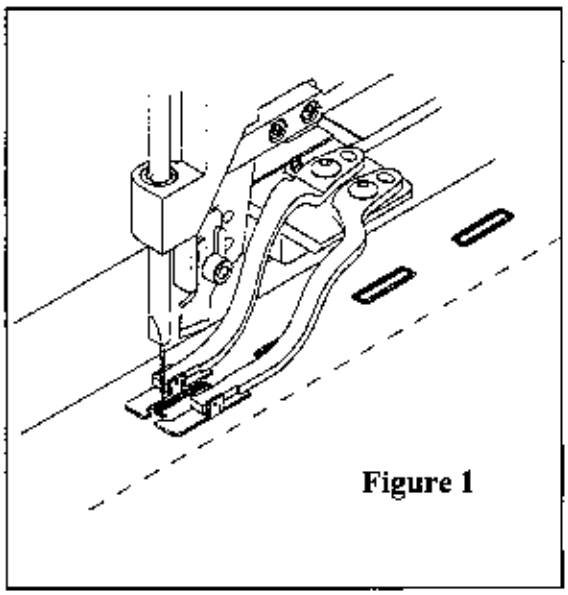


Figure 1

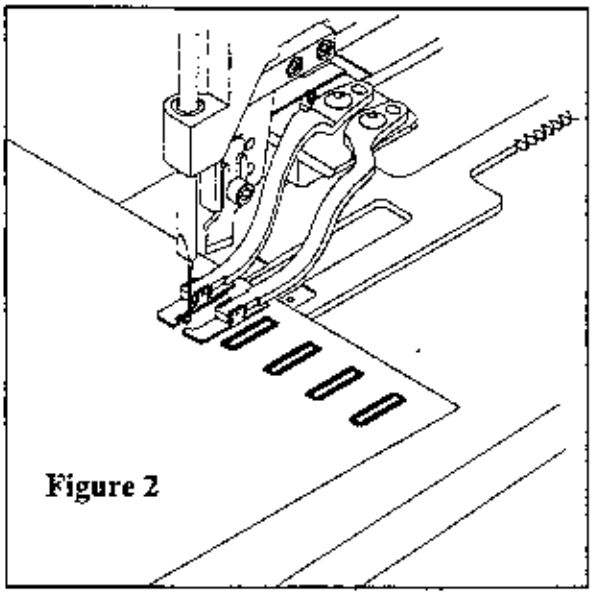
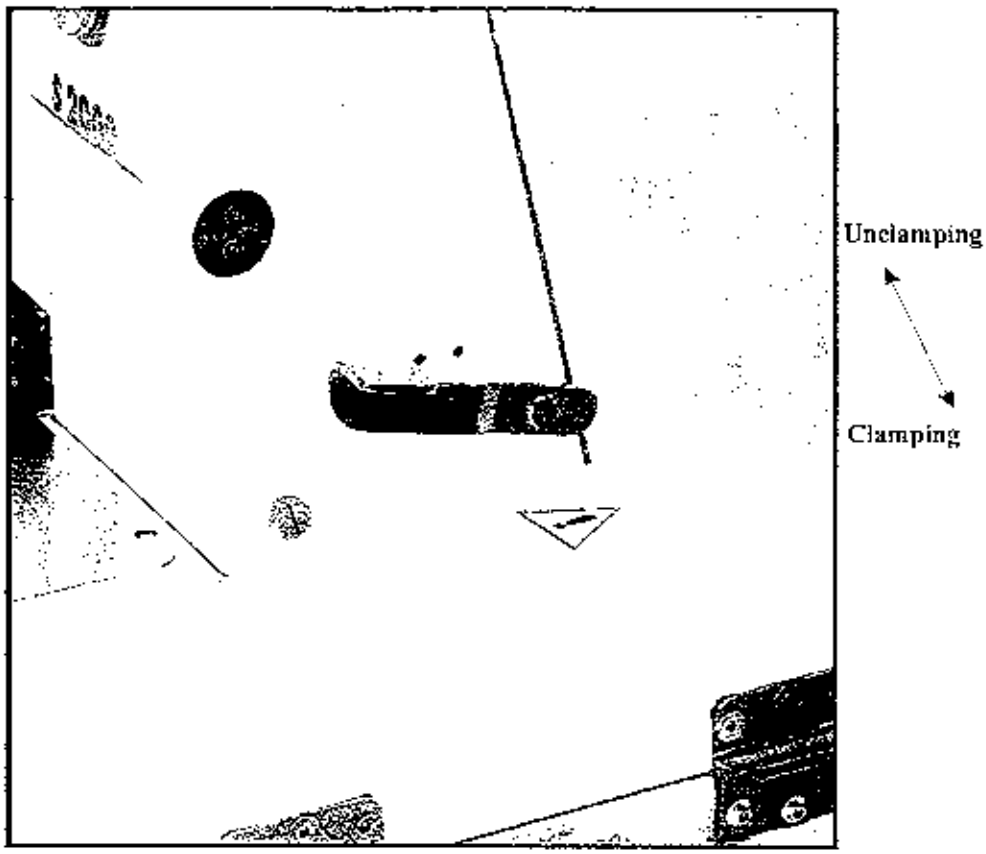


Figure 2

7. To start sewing, *press* the small foot pedal all the way down and release. The machine will automatically clamp the material, sew and cut the buttonhole, trim the thread and stop with clamps in a raised position, ready for starting the next buttonhole.

OPERATOR INSTRUCTIONS

The clamps may be raised or lowered any time for removal or adjustment of the material by manually lifting the unclamping handle in the direction shown by the arrow in the picture below.



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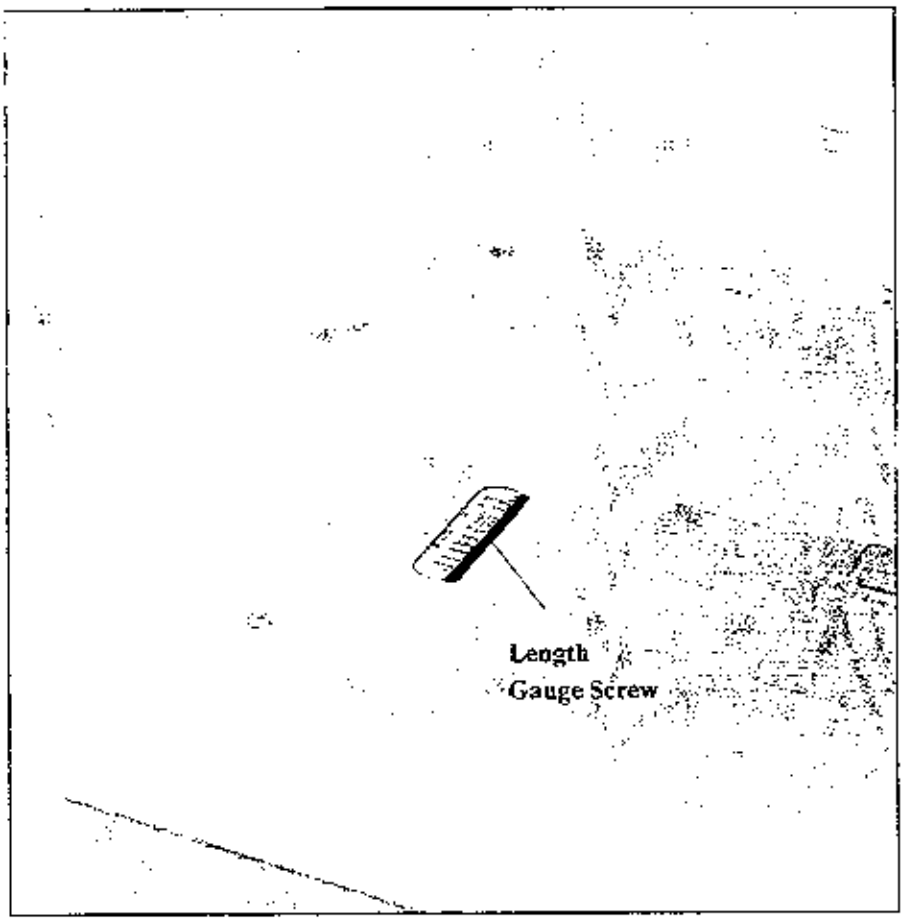
OPERATOR INSTRUCTIONS

Changing the Length of the Buttonhole

1. Using the allen key provided, *loosen* the screw beside the length gauge (as shown below). *Move* the screw using the allen key and *use* it as a pointer to line up the correct buttonhole length indicated by the gauge.

2. *Tighten* the screw.

Note: When the length of the buttonhole changes, ***the knife also changes*** to the corresponding size shown on the gauge.



OPERATOR INSTRUCTIONS

The Knife

For quality buttonhole cuts, the knife must be sharp and straight in the knife holder. Test the knife for straightness. If the knife appears bent, damaged or dull, it should either be sharpened or replaced.

Sharpening the Knife

When the knife fails to cut correctly, remove, stone to a sharp edge and replace.

Changing the Knife

The knife ***must*** be changed whenever the buttonhole length changes.

1. *Loosen and remove* the knife holder screw. *Pull* the knife down and out of the slot.

WARNING! ***The knife has sharp edges. Be sure to handle and discard the old knife safely.***

2. *Hold* the new knife against the knife holder and *slide* it all the way up into the slot until the base of the knife slot stops against the screw.

3. *Tighten* the knife holder screw.

Note: ***Installation is correct when the knife size number is facing the operator.***

4. *Push down* on the knife lever and *make sure* the knife blade goes through the center of the throat plate. If entry is not centered, *check* the position of the knife in the knife holder.

CAUTION: ***If entry is not centered, but the knife is inserted correctly, a service technician will need to make further knife adjustments.***

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PRELIMINARY INSTRUCTIONS

Before making any adjustments to this machine, it is necessary to understand how to manually *press* the machine in different stages of its normal operating cycle. These stages are:

* **Home position**
* **First row of stitches**
* **First bar**
* **Second row of stitches**
* **Second bar**

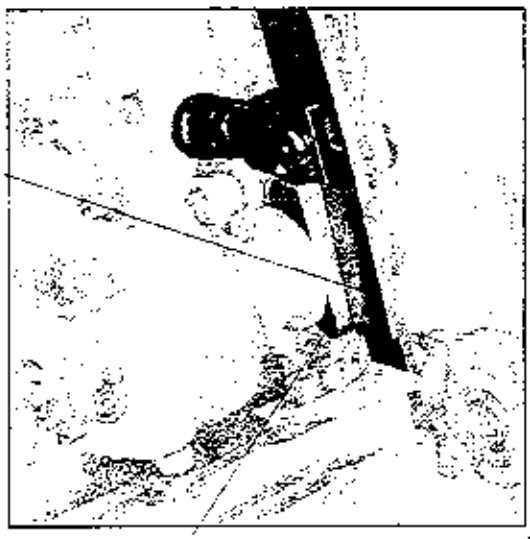
Home position is when:

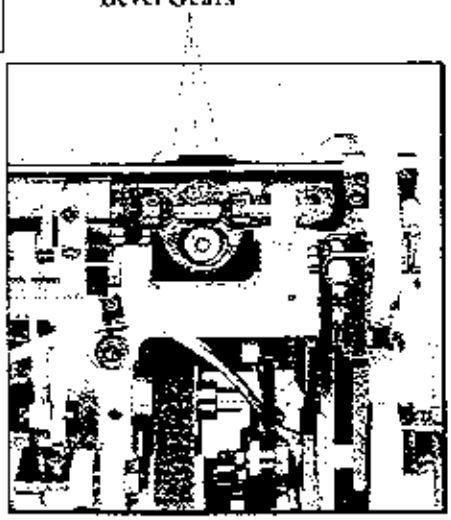
The stop lever is resting on the flat side of the stop cam,

The drive spring is within 2mm of dropping into the detent on the left shifter block,

The two horizontal bevel gears are slightly disengaged from the vertical bevel gear,

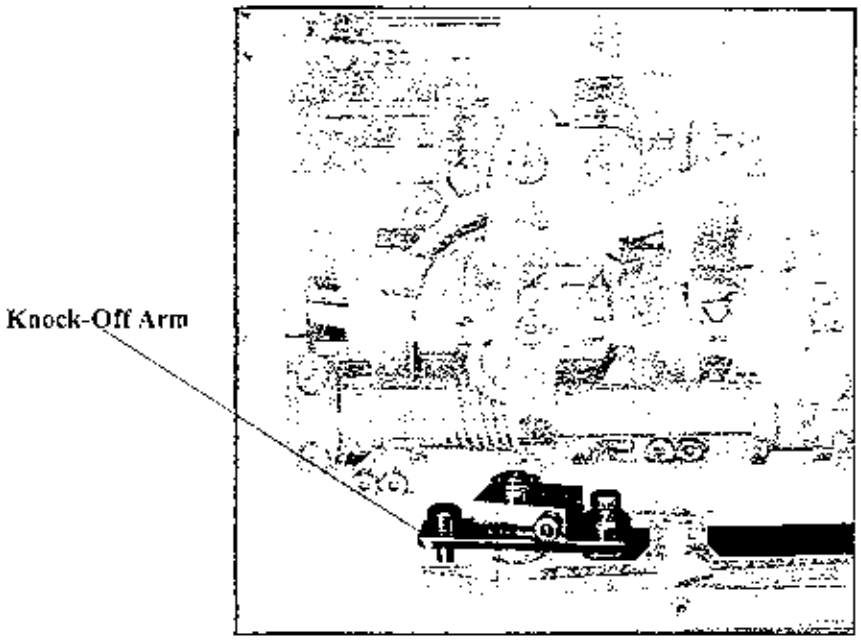
The clamp plate is to the right (towards the head casting).



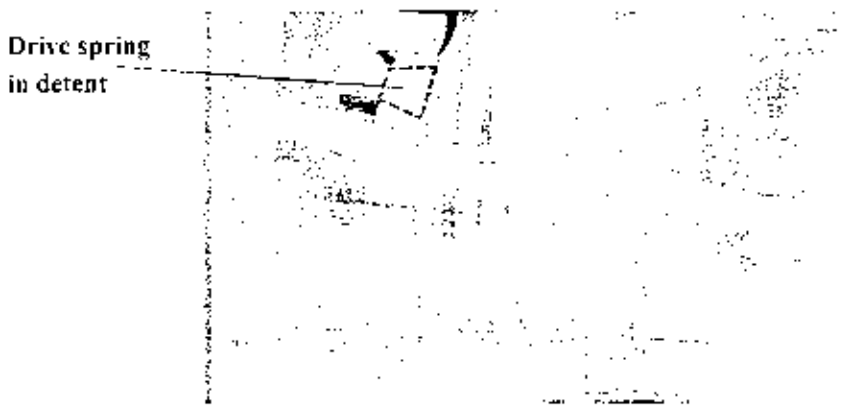


The first row of stitches:

To reach this position, *tip* the machine back on its hinges and manually *engage* the knock off arm.



This engages the clutch and releases the stop lever from the stop cam. *Turning* the hand wheel counterclockwise moves the drive spring fully into the detent and engages the right bevel gear with the vertical gear. Further *turning* of the hand wheel causes the machine to stitch on the first row of stitches.



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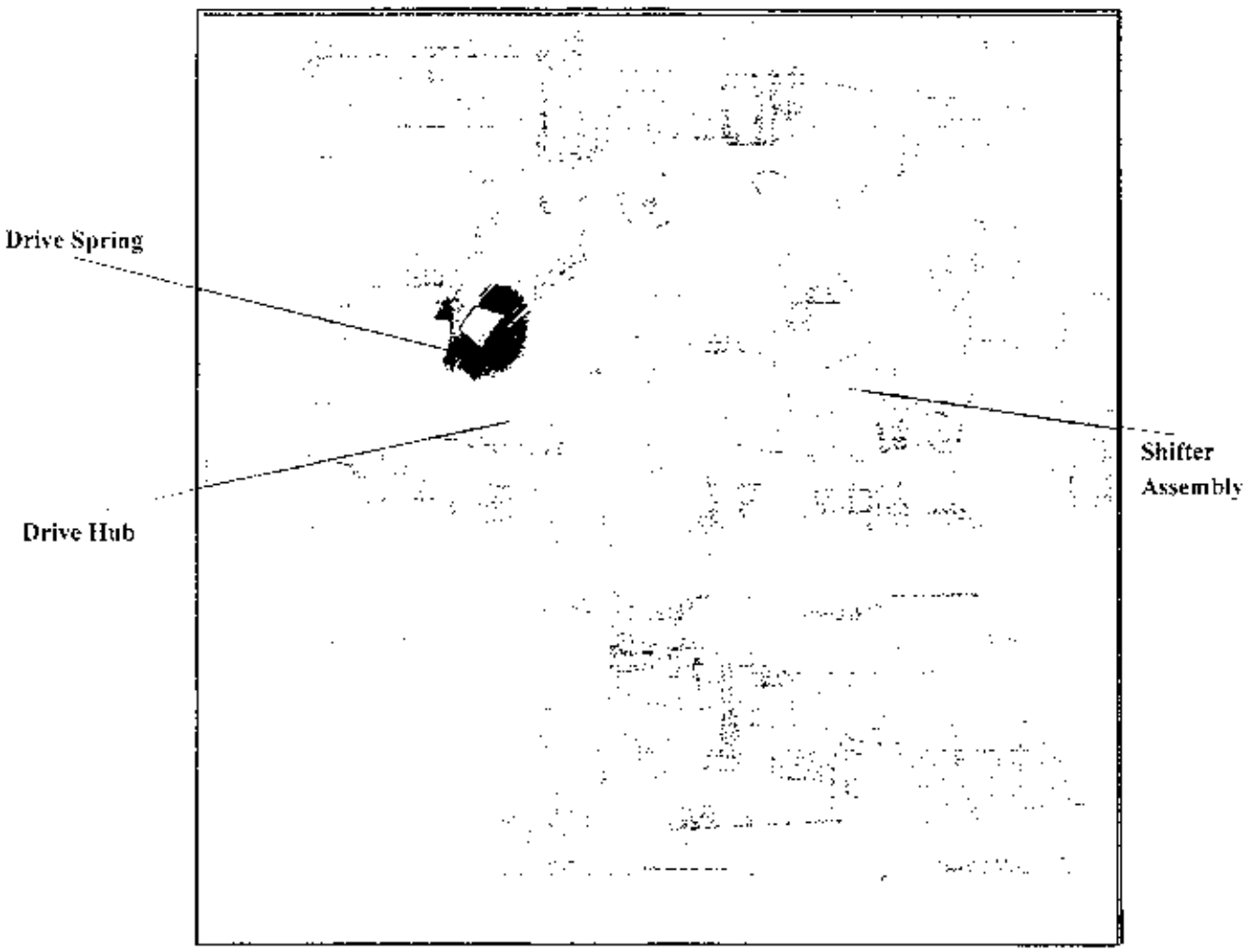
The first bar:

To reach this position, after several main shaft revolutions have been made in the first row of stitches, *slide* the shifter assembly to the left.

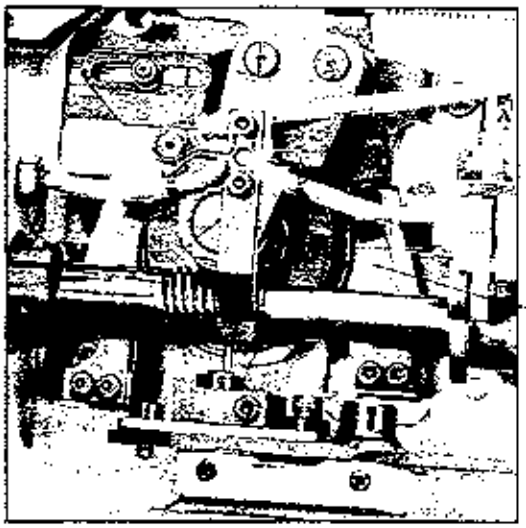


This releases the drive spring from the detent, engages it with the drive hub and centralizes the feed gears. Continue *turning* the hand wheel, and the machine will make six barring stitches to form the first bar.

PRELIMINARY INSTRUCTIONS

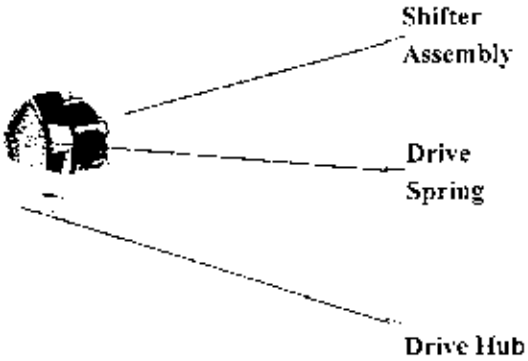
The second row of stitches:

As the drive spring contacts the right shifter arm, it is pressed down out of engagement, and into a detent. This stops the first bar and engages the left bevel gear, reversing the feed direction for the second row of stitches.



The second bar:

To reach this position, slide the shifter assembly to the right, releasing the drive spring from the detent and engaging it with the drive hub.



Continued counterclockwise turning of the hand wheel centralizes the feed, makes the second six barring stitches, then toggles off the knock off assembly and prepares the machine for stopping.

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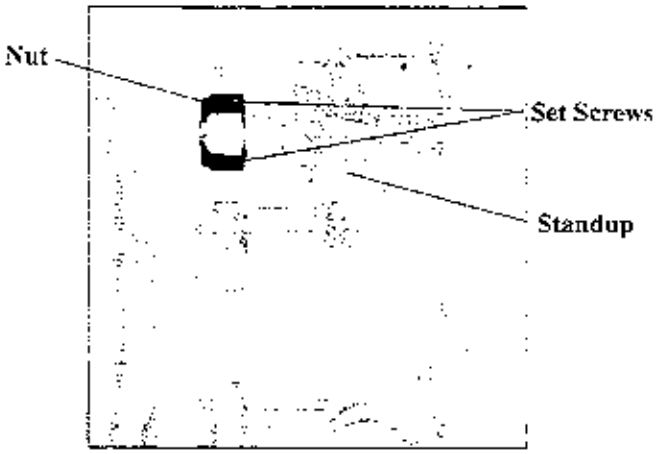
ADJUSTMENTS

Removing End Play in the Top Shaft

Allowable end play on the top and main shafts has been correctly set at the factory. If there appears to be more than zero end play in the upper shaft:

1. *Make sure* the machine is in the home position with the stop cam engaged with the stop lever.
2. *Loosen* the set screws on the nut and *turn* the nut clockwise to remove end play.
3. *Tighten* the set screws.

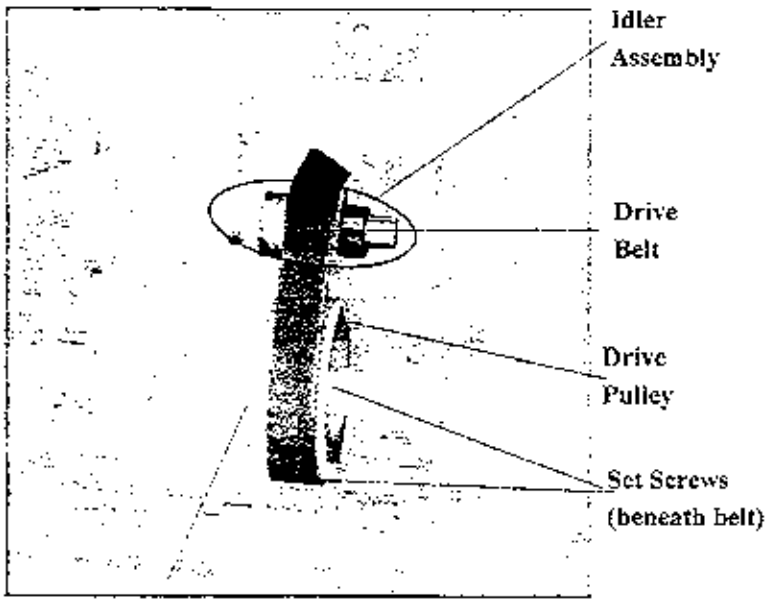


Removing End Play in the Main Shaft

There should also be ***zero end play*** in the main shaft.

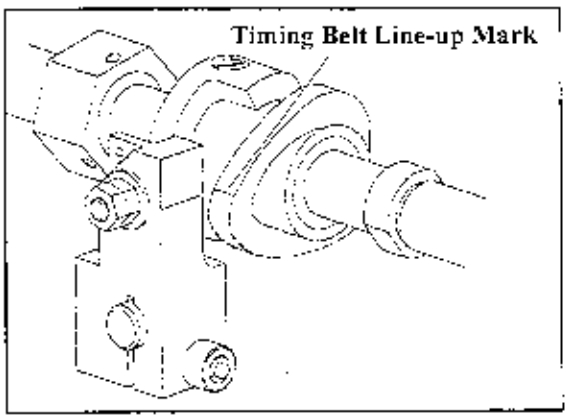
To adjust:

1. *Remove* the idler assembly.
2. *Move* the shaft to the right so the snap ring is up against the bearing at the looper cam (not shown).
3. *Slide* the timing belt off the pulley to the right.
4. *Loosen* the set screws on the drive pulley and *move* the pulley left against the bearing.
5. *Tighten* the screws.



Setting the Top Shaft to the Main Shaft

1. *Set* the main shaft in the home position.
2. *Set* the top shaft by turning the top shaft assembly clockwise until the first timing mark on the knife cam lines up with the timing mark on the knife cam follower.
3. *Install* the idler assembly and then the idler belt.
4. *Adjust* the idler eccentric to tighten the belt.
5. *Tighten* the idler set screw and *check* the timing mark position.



ADJUSTMENTS

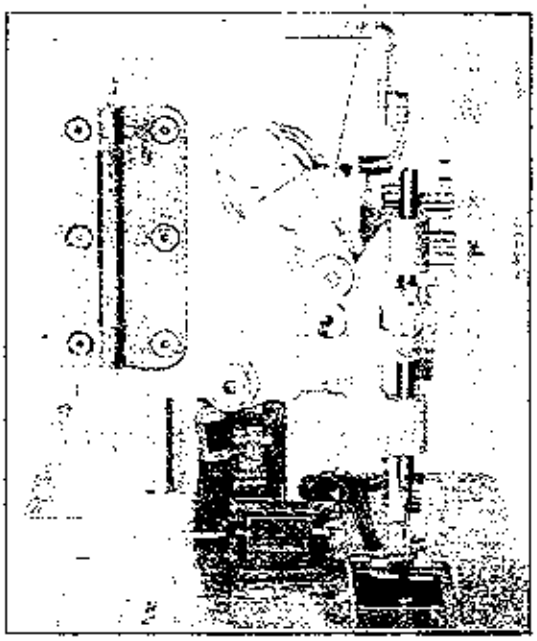
Setting Needle Bar Bell Eccentric Position

1. Slightly *loosen* the clamping screw in the bell eccentric and *rotate* the assembly until the needle bar reaches ***top dead center*** in the home position.

2. *Tighten* the clamping screw.

Note: To confirm this adjustment, (with the machine in home position), rock the hand wheel "hard" forward and backward, and in each extreme the needle bar should move downward.

Bell Eccentric NOTE: Bell eccentric Home



3. With the machine in home position, *set* the needle bar height to 16.0mm (5/8") from the top of the throat plate to the center of the needle eye. To adjust: *loosen* the set screw and *move* the needle bar up or down, as necessary.

Needle Bar

Set Screw

Screw

Bell

NOTE: Bell eccentric 90° from Home for access to screw.

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ADJUSTMENTS

Setting the Clutch Air Gap and Brake

With the machine in the home position, there is a .4mm (.015") air gap clearance between the hand wheel and the timing pulley. **CAUTION:** If clutch heats up, increase this clearance to .018". To adjust:

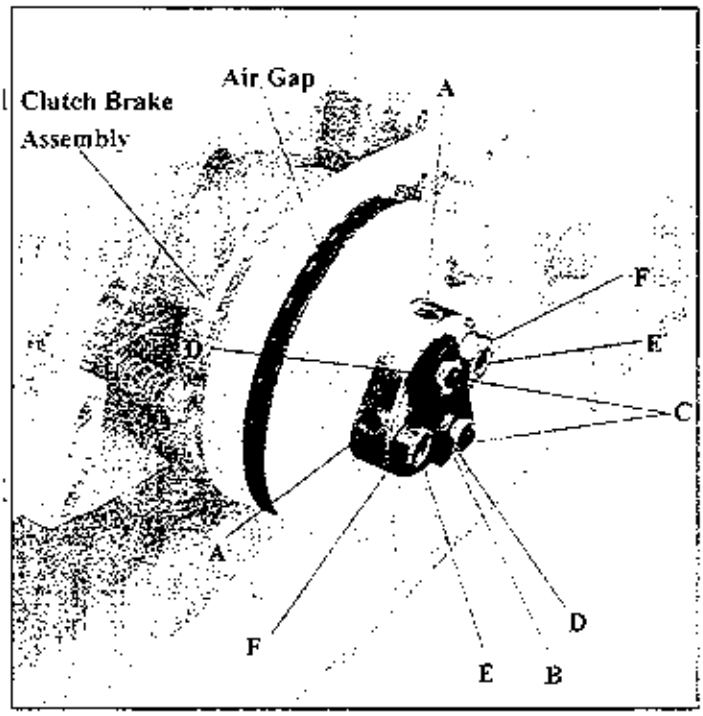
1. *Loosen* lock nut **D** and set screws **C**.

2. *Loosen* the hand wheel disc set screws **A**. *Use* a feeler gauge and *move* the hand wheel in or out, as necessary. Then *tighten* set screws **A**.

3. To maintain the air gap setting, and ensure the hand wheel doesn't move, *adjust* screws **C** until they ***just barely*** touch the hand wheel, *tighten* lock nuts **D**.

CAUTION! ***When the air gap is changed, the stop/start pin adjustment (page 1-24) must be checked.***

Note: When the machine is disengaged and the air gap is set correctly at .4mm, ***there will be a moderate to heavy drag on the clutch brake assembly***. This drag (or braking action) is ***very important*** for correct stopping of the machine.



To adjust the brake pressure:

1. *Make sure* the flat head screw **B** is tightened securely and the machine is in the home position. Loosen nuts **F**.

2. There are springs located behind set screws **E**. To adjust the strength of these springs: tighten set screws **E** until the screws stop turning. Now, *back off* the screws ***three full turns*** and *tighten* lock nuts **F**. **Note:** This is an initial setting.

3. To test braking action: *put* the machine in the sew position and *turn it over* manually until it knocks off at 90^{o}, there must be moderate to heavy drag on the hand wheel.

4. *Use* material, thread, and knife, and *test* run the machine.

5. *Check* to make sure the stop cam is in the correct position with the stop lever (see page 1-17). If the cam over drives (moves the drive spring into the detent — see page 1-17), *increase* pressure by loosening lock nuts **F** and *turning* set screws **E** inward, 1/4 turn at a time. If the machine under drives (does not come home), decrease pressure by *loosening* lock nuts **F** and *back* off set screws **E** 1/4 turn at a time.

6. After adjusting, *tighten* lock nuts **F**.

ADJUSTMENTS

Adjusting the Stop/Start Pin

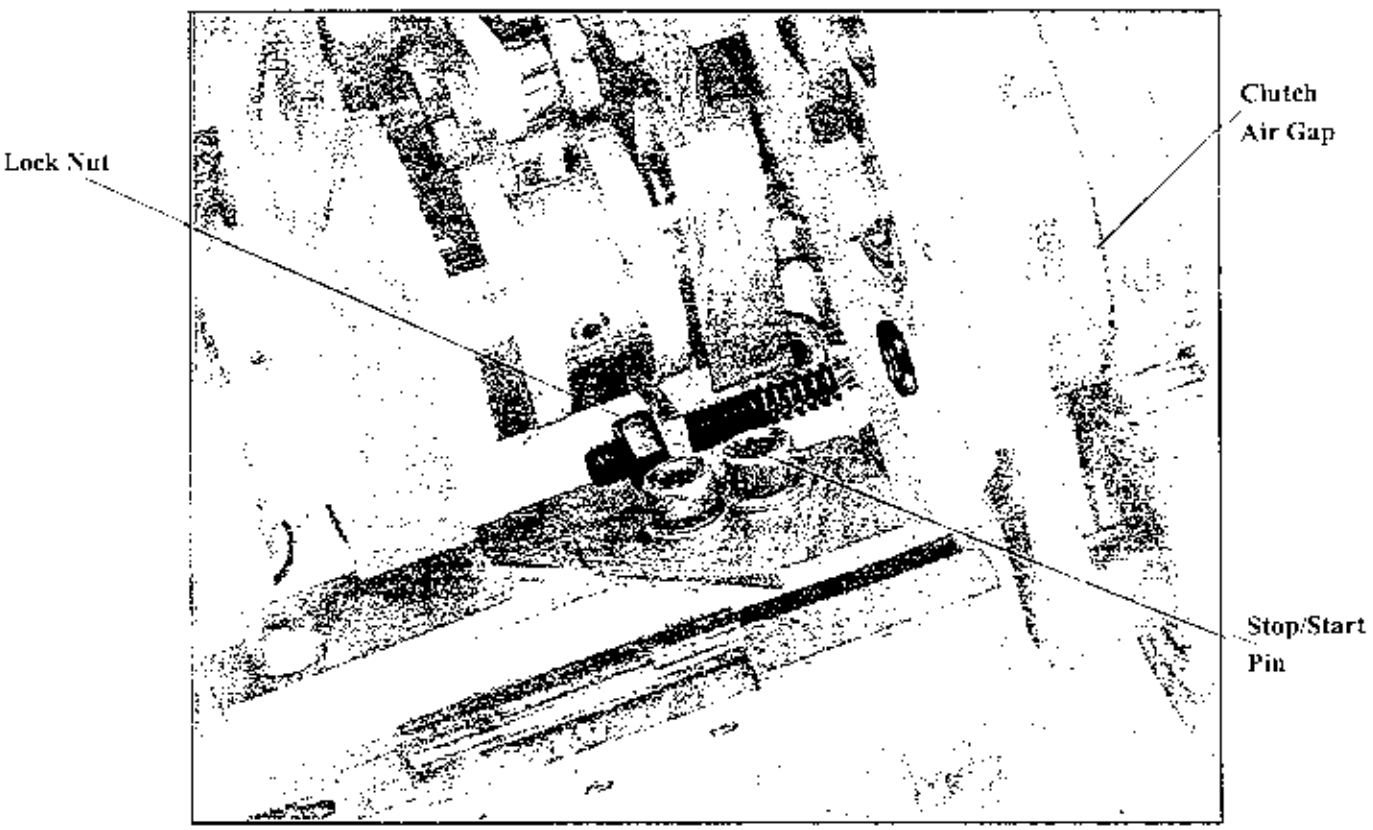
1. *Turn off* the power and *dissipate* stored energy in the motor by *engaging* the left foot pedal until the clutch drive pulley stops rotating.

2. With the machine in the run position, *adjust* the stop/start pin "in" until the clutch is firmly engaged.

Note: *Too much* "in" adjustment will make it extremely difficult to engage the starting lever past center. *Too little* "in" adjustment and the clutch will slip. To adjust:

1. *Loosen* the lock nut on the stop/start pin and *rotate* the pin clockwise (as viewed from the clutch end) or counterclockwise, as necessary. Clockwise makes it easier to engage, counterclockwise makes the clutch more difficult to engage.

Note: Manually *rotate* the hand wheel while applying resistance to the drive belt to check for correct engagement.



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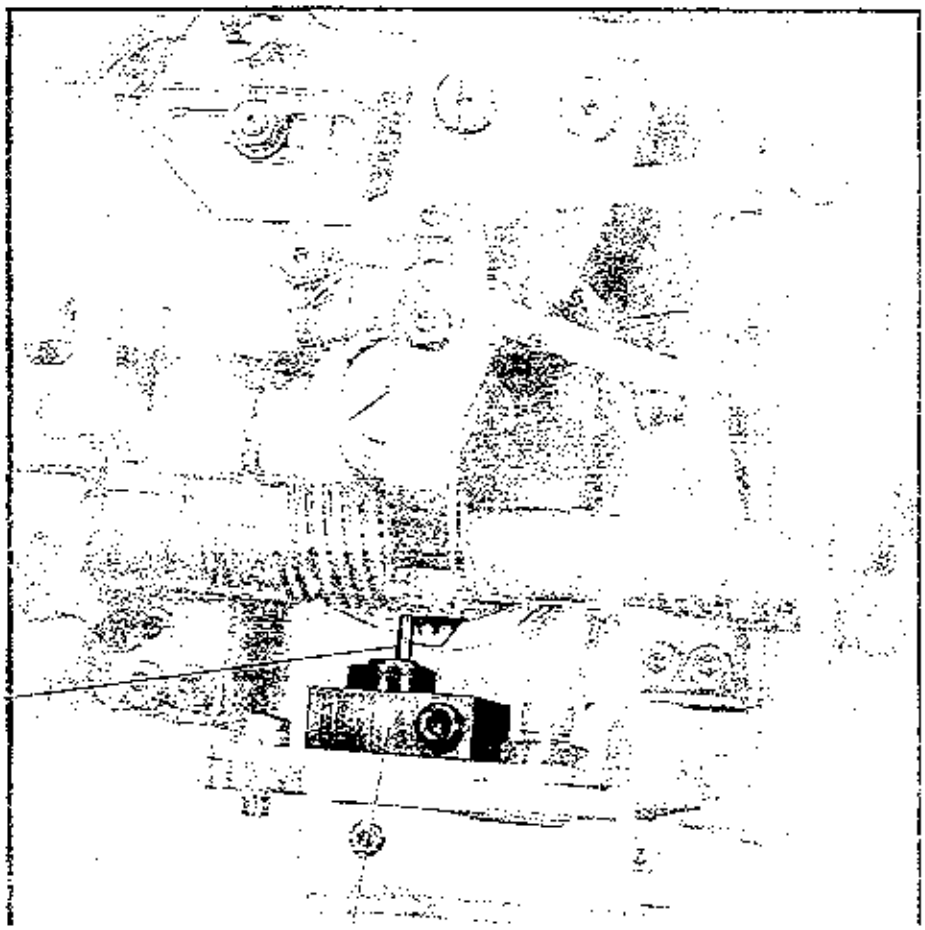
ADJUSTMENTS

Adjusting the Drive Hub and Worm Gear for Stopping and Barring

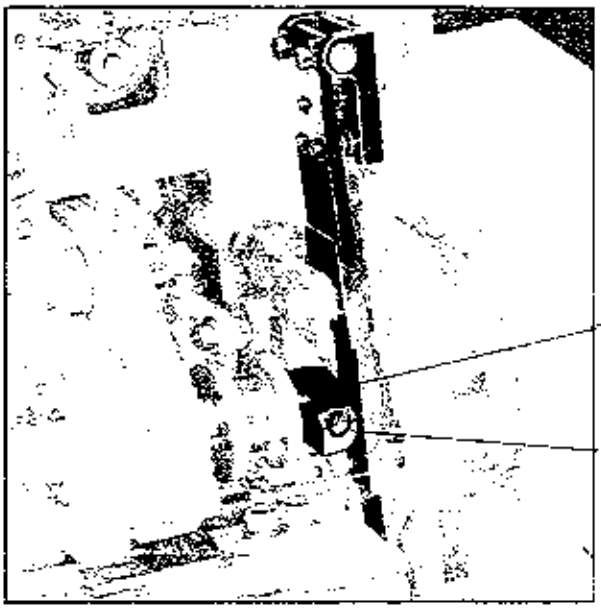
A. Preliminary Knock Off

At the end of the second bar, the stop cam disk strikes the vertical pin on the knock-off arm, causing it to release. This also releases the stop/start pin and prepares the machine for stopping.



ADJUSTMENTS

Correctly adjusted, when the knock off arm releases, the securing set screw on the stop cam will be facing *away* from the bedplate, 3/4 of a revolution from home position.

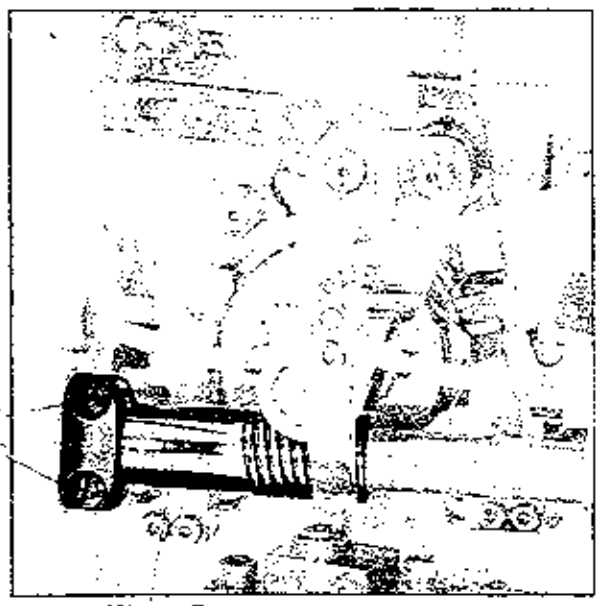


To adjust:

1. *Loosen* the 2 clamping screws on the worm gear.

2. If the stop cam is too fast (or less than 3/4 revolution from home), *hold* the worm gear, keeping it tight against the bearing, and *rotate* the hand wheel clockwise, as necessary. *Tighten* set screws and *check* setting.

3. If the stop cam is too slow (or more than 3/4 revolution from home), *hold* the worm gear, keeping it tight against the bearing, and *rotate* the hand wheel counterclockwise, as necessary. *Tighten* set screws and *check* setting.



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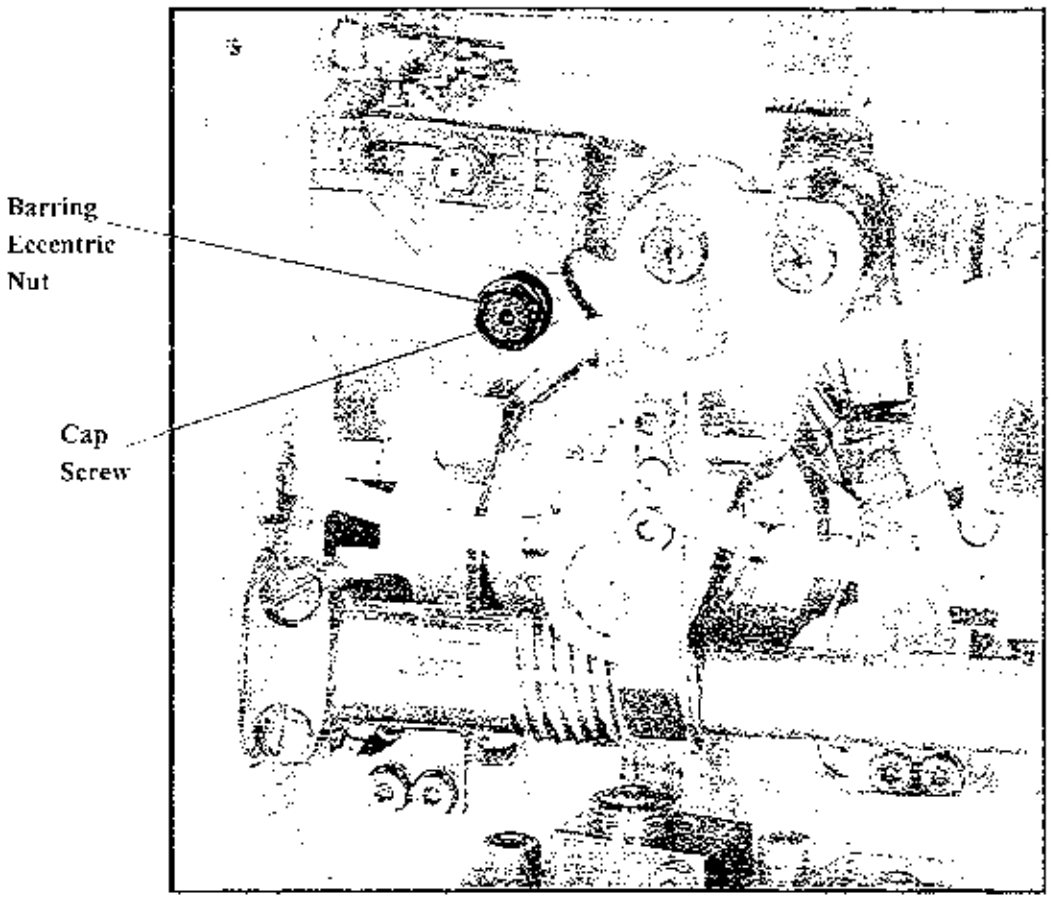
ADJUSTMENTS

B. Adjusting the Barring

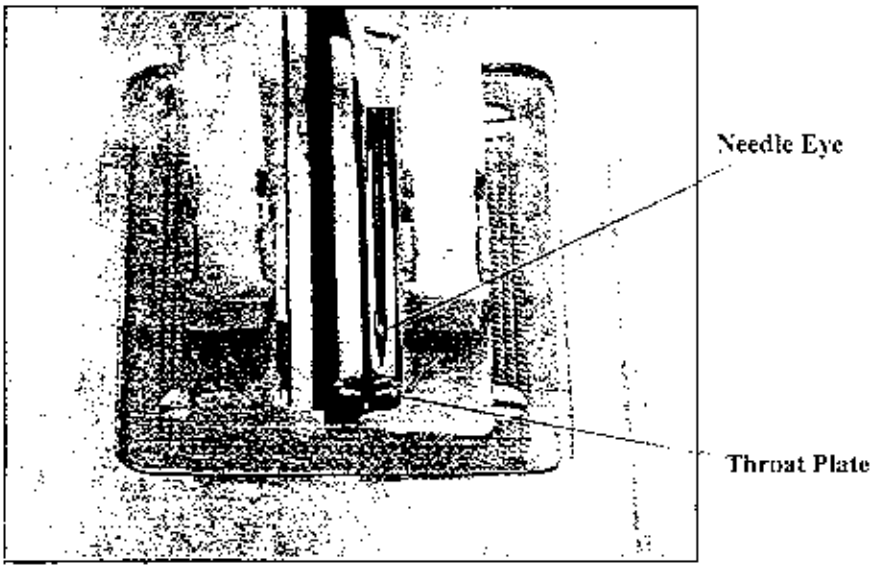
The same adjustment is used to prevent the clamp plate feeding while the needle is in the material. To check:

1. *Put* the machine in the barring position.



2. *Loosen* the cap screw and *adjust* the barring eccentric nut for minimum play.
3. *Tighten* the cap screw.

4. While manually *rotating* the machine, *observe* the movement of the needle when the clamp plate begins moving. When properly adjusted, clamp plate movement should begin just as the needle's eye emerges from the throat plate (as shown).

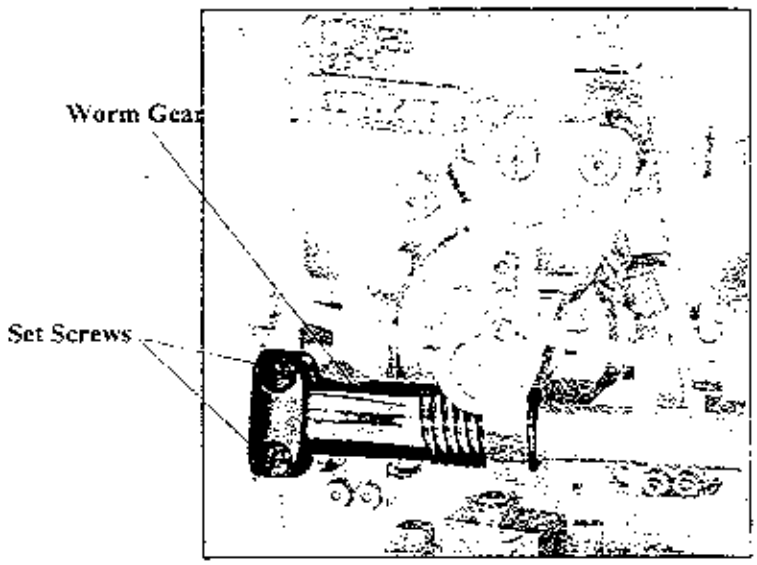


To adjust:

a) *Loosen* the clamping screws on the worm gear.

b) While holding the worm tightly against the bearing to prevent side-to-side movement, *rotate* the hand wheel clockwise (as necessary) if clamp plate movement is too late. If clamp plate movement is too early, hold the worm tight against the bearing and *rotate* the hand wheel counterclockwise (as necessary).

c) *Tighten* the clamping screws.



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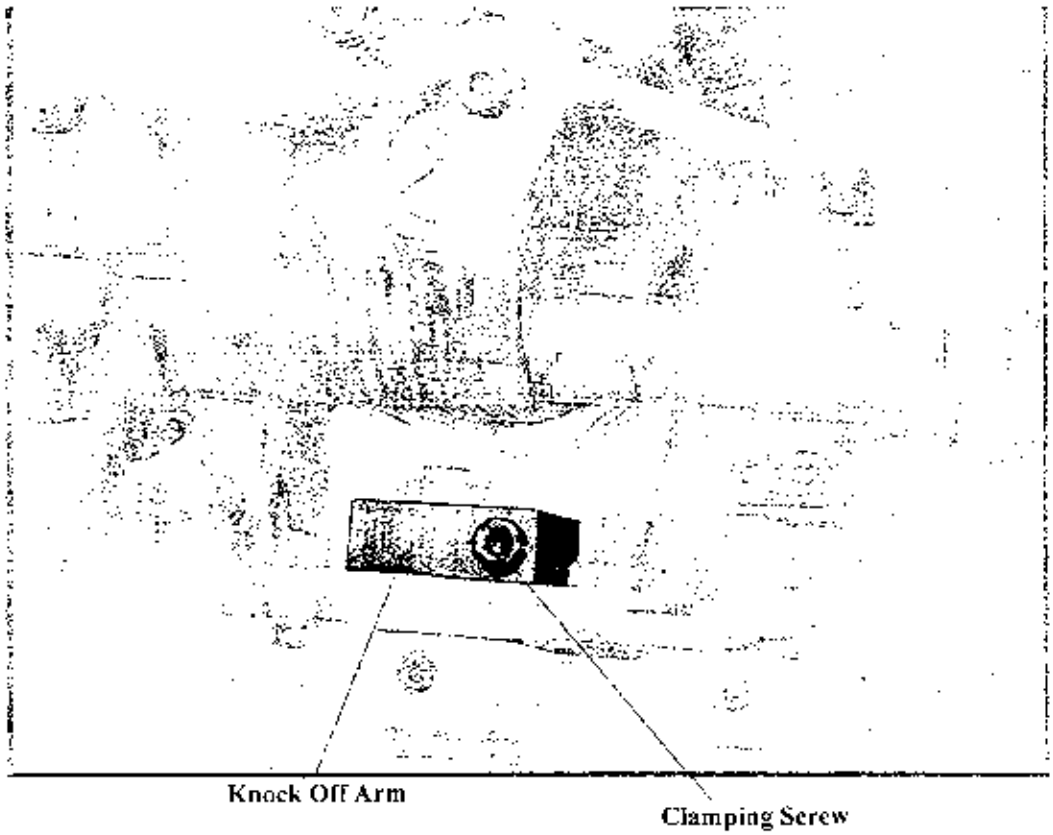
ADJUSTMENTS

C. Refining the Knock Off Position

Adjusting the drive hub and the worm gear drive *usually* changes the knock off position (the stop cam screw 3/4 revolution from home). To refine:

1. *Loosen* the clamping screw and *rotate* as necessary.
2. *Tighten* the screw.



ADJUSTMENTS

Adjusting the Clamp Plate Zero Position

When the machine stops and starts at the same place every time, the possibility of producing buttonholes with gaps is eliminated. To achieve consistent stopping and starting positions, the clamp plate **must** be adjusted for a zero position. To adjust:

Note: Setting for a shorter stitch length will require less manual cranking.

1. With the machine in the home position, *remove* the needle and the knife. *Remove* the 7 screws holding the cover plate, and *remove* the cover plate.
2. *Loosen* the 2 screw securing the stop and *move* it out of the way.

Note: Because the cover plate is removed, it will be necessary to *manually secure* the clamp plate when running the machine.

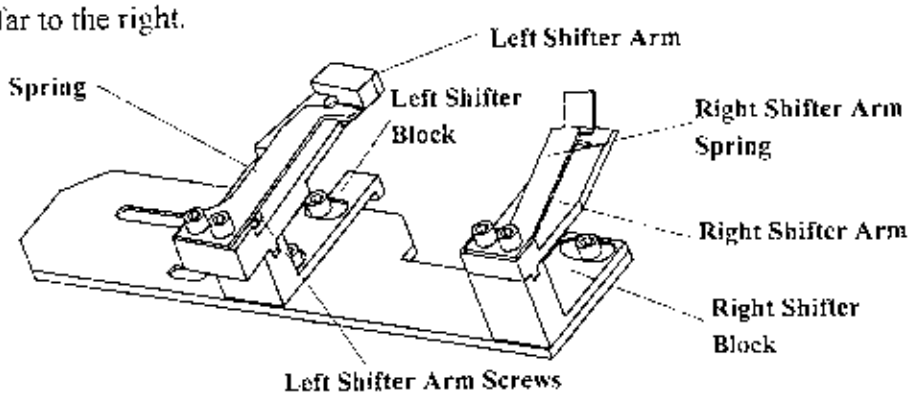
3. *Tilt back* the head.
4. Manually *engage and crank* the machine until the drive spring releases from the left shifter spring..
5. As soon as the drive spring is released, ***stop*** cranking and *tilt* the machine back. *Check* to be sure there is a minimum clearance of .002 to .005mm between the shifter plate and the boss of the casting. ***If the shifter plate is not within .002 to .005mm of the boss:***

6. *Remove* the 2 screws and left shifter spring. Loosen the two left shifter arm screws connected to the block. Move the arm to the right to position the shifter plate closer to, or to the left to position the shifter plate further from, the boss, when the drive spring releases (see drawing B).

Note: The left spring must be installed to check the position. When installing the left shifter spring, ensure the right side of the spring is even with or past the left shifter arm. If the spring is in front of the shifter arm, it will lock up when trying to disengage.

Caution! The drive spring will not release, and will continue to sew in one spot without feeding, if the shifter is moved too far to the right.

Drawing B



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ADJUSTMENTS

6. When .002-.005mm clearance is obtained, *tighten* the screws.
7. *Continue* to manually *rotate* the machine through the first bar and the second row of stitches.

Note: When the drive spring releases from the right shifter arm, the shifter plate should be within .002-.005mm clearance of the boss. ***To adjust:***

Loosen the 2 set screws on the right-hand shifter arm and spring. Moving the shifter arm and spring to the *right* results in *more* clearance between the shifter arm and the boss when the drive spring releases; moving it to the *left* results in *less* clearance between the shifter arm and the boss when the drive spring releases (***see drawing B***).

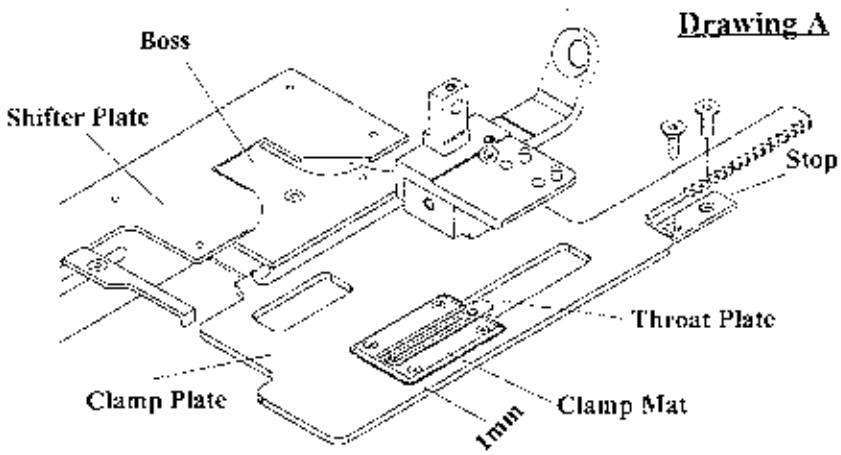
8. *Continue* to manually *crank* the machine until it reaches the home position.
9. *Move* the stop until it contacts the edge of the clamp plate (***see drawing A***). *Firmly tighten* the screw.
10. Once in home position, the following 3 conditions **must** be met:

   a) **the shifter plate must be within .002-.005mm or less of the boss on the casting (*see drawing A*),**
   b) **the clamp plate must be against the stop (*see drawing A*),**
   c) **and the clamp mat must be 1mm from the throat plate (*see drawing A*).**

11. While holding the clamp plate down, *cycle* the machine several times and *make sure* the above conditions remain constant. If they do, *replace* the cover plate and *install* the 7 screws. Test sew on a scrap piece of material.
12. If the above conditions **are not met**, *repeat* steps 7 through 11.

Note: It is not unusual to have to repeat steps 7 through 11 several times to obtain correct adjustments.

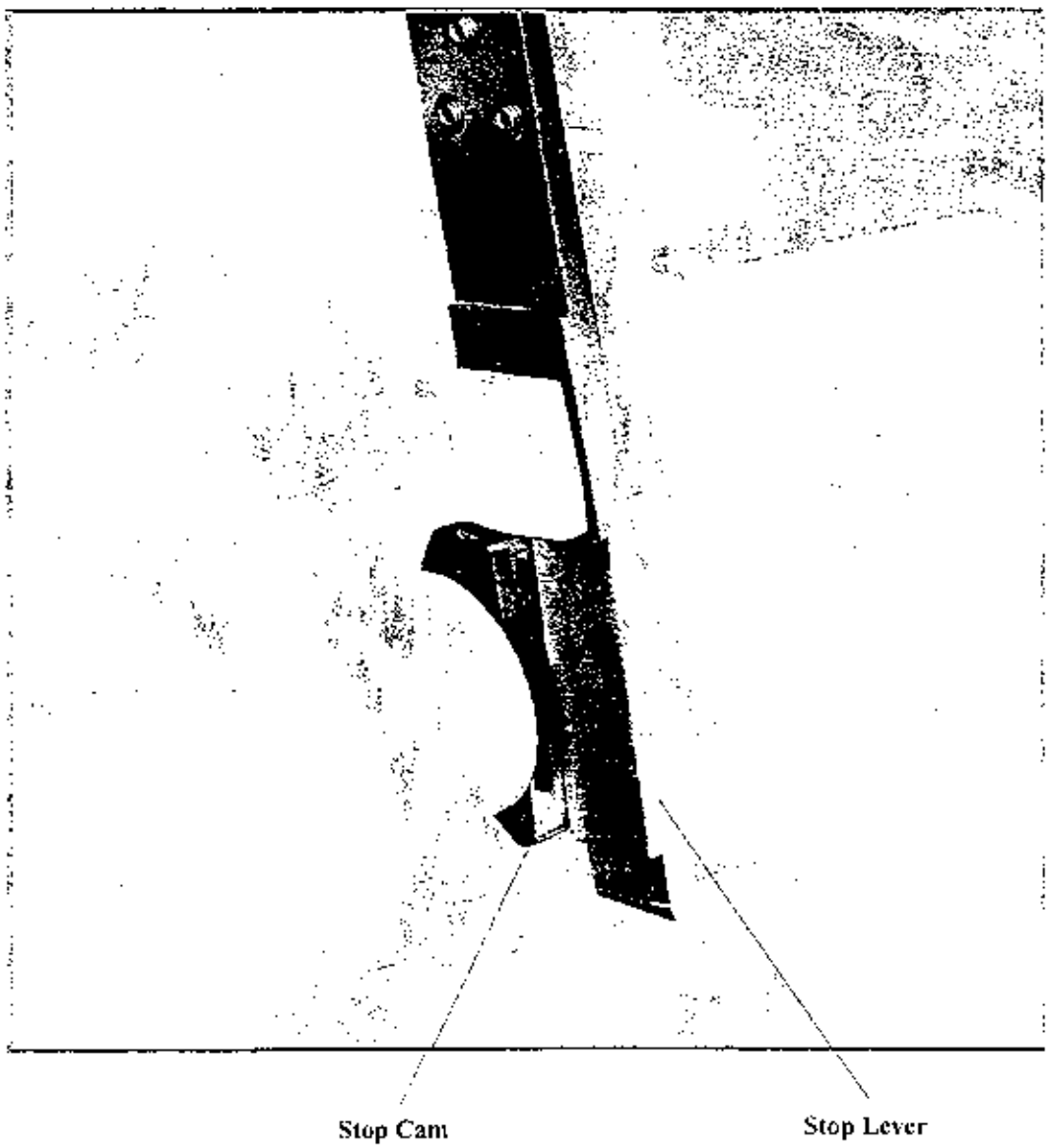
Drawing A



ADJUSTMENTS

Stop Motion

Before making these adjustments, put the machine in the home position as shown.

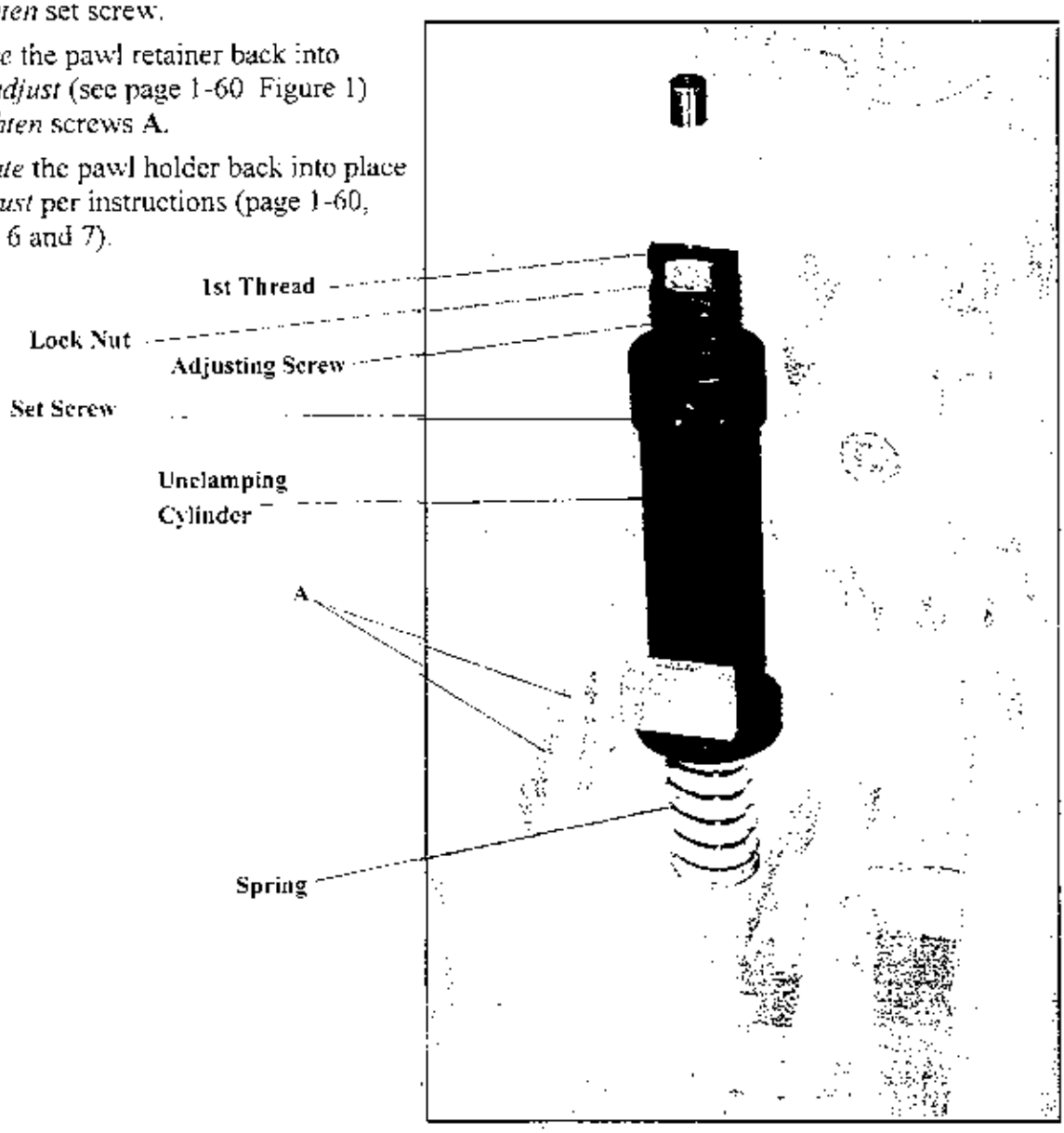


ADJUSTMENTS

Stop Bolt Spring Pressure

The first thread of the stop bolt should be just past the top of the lock nut. To adjust:

1. *Loosen* 2 screws **A** on the pawl retainer and *move* the retainer away from the unclamping cylinder.
2. *Loosen* the lock nut and the set screw on the unclamping cylinder.
3. *Rotate* the adjusting screw up or down, as necessary, and *tighten* lock nut.
4. *Move* the unclamping cylinder so the set screw is in alignment with the nearest flat.
5. *Tighten* set screw.
6. *Move* the pawl retainer back into place, *adjust* (see page 1-60 Figure 1) and *tighten* screws **A**.
7. *Rotate* the pawl holder back into place and *adjust* per instructions (page 1-60, steps 5, 6 and 7).



ADJUSTMENTS

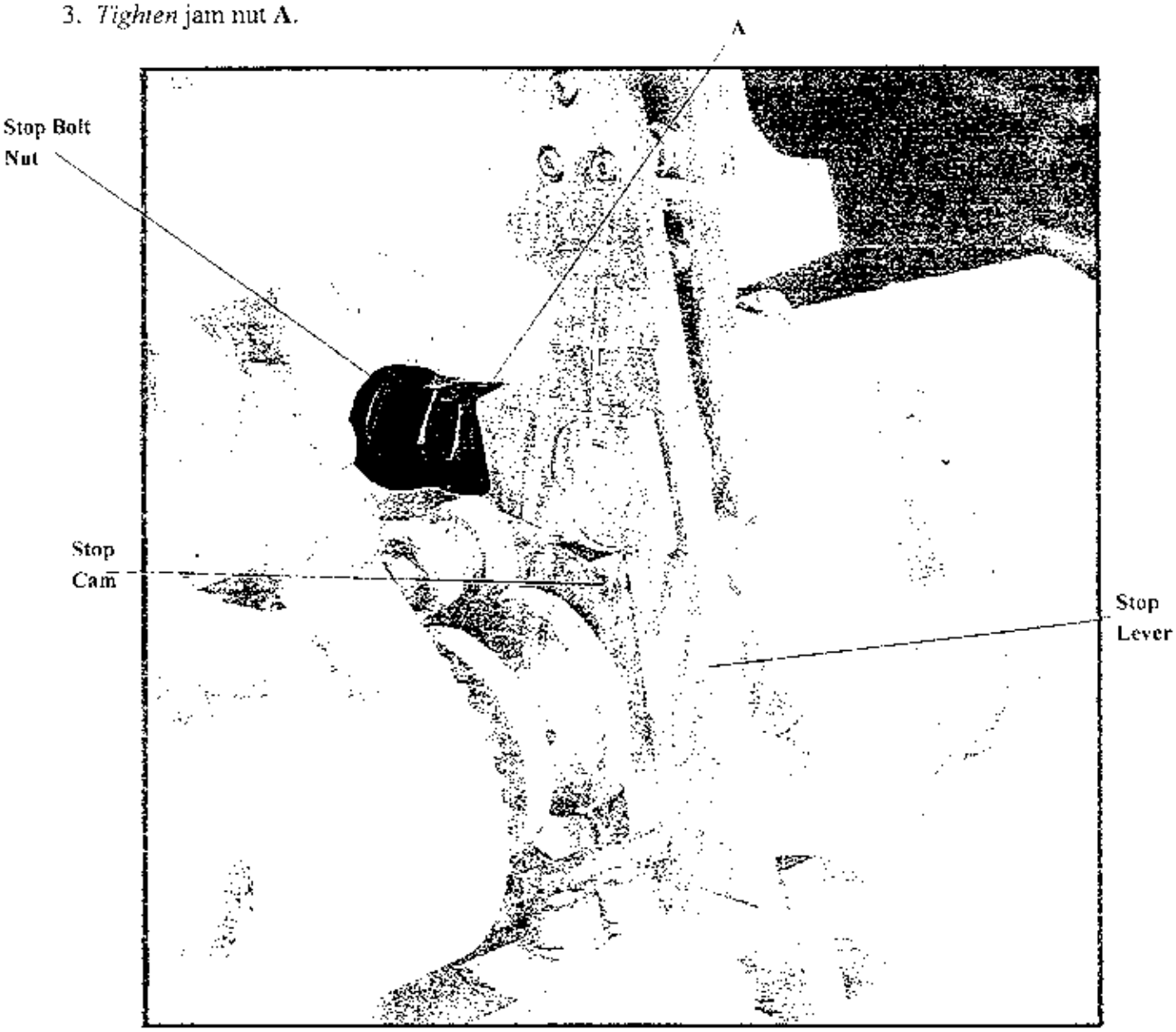
Stop Cam to Stop Lever Clearance

There is a clearance of .5mm clearance between the stop cam and the stop lever. To adjust:

1. *Loosen* jam nut **A**.

2. *Rotate* the stop bolt nut clockwise for more clearance, or counterclockwise for less clearance, as necessary.

3. *Tighten* jam nut **A**.



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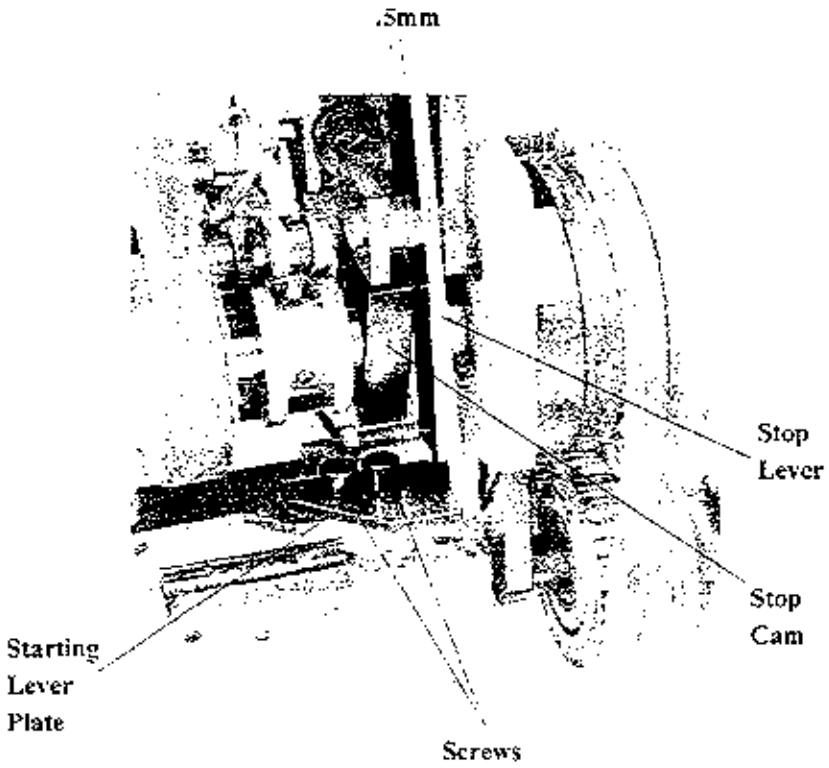
ADJUSTMENTS

Stop Lever Engaged Position

With the machine in the engaged position, there is a .5mm clearance between the stop cam and the stop lever. To adjust:

1. *Move* the starting lever plate by loosening the screws.
2. Manually *move* the plate back and forth, as necessary.
3. *Tighten* the screws.



ADJUSTMENTS

The Knife Cam

The roller on the knife cam lever must enter the cam groove approximately 1/4 turn *before* the home position.

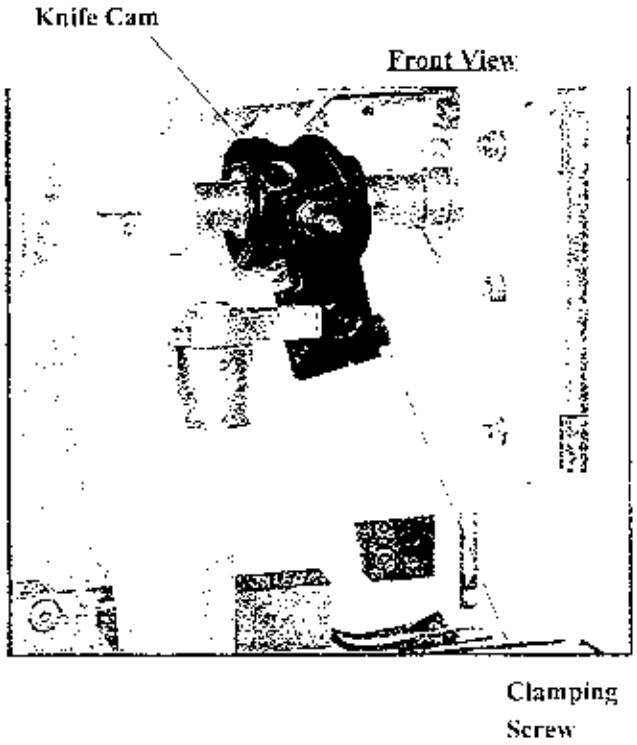
Adjusting Knife Cam Pin Clearance to the Outside Diameter of the Knife Cam

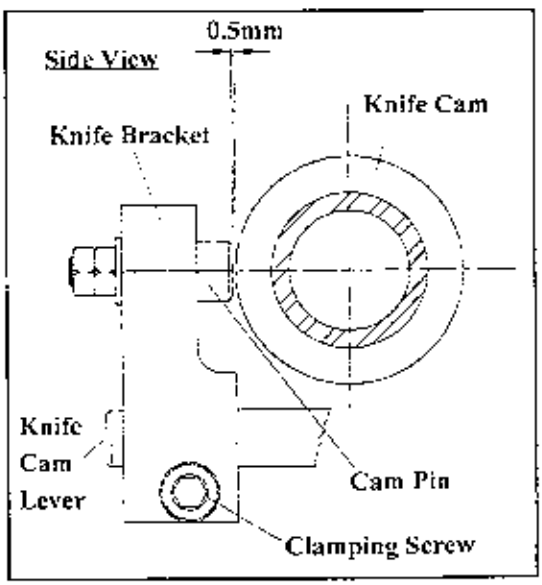
1. To simplify this adjustment, *put* the machine in the sew position, *loosen* the clamping screw and *position* the knife cam follower so there is a 0.5mm clearance between the ***outside*** diameter of the knife cam and the ***end*** of the knife cam pin.

2. *Return* the machine to the home position.

3. With the knife lever assembly held in the full up position, *make sure* the knife cam pin is in perfect alignment with the cam groove.

CAUTION! As the cam pin enters the knife cam groove, there must be ***no sidewards movement***. If there is movement, *loosen* the clamping screw, *adjust* as necessary and *tighten* the clamping screw.

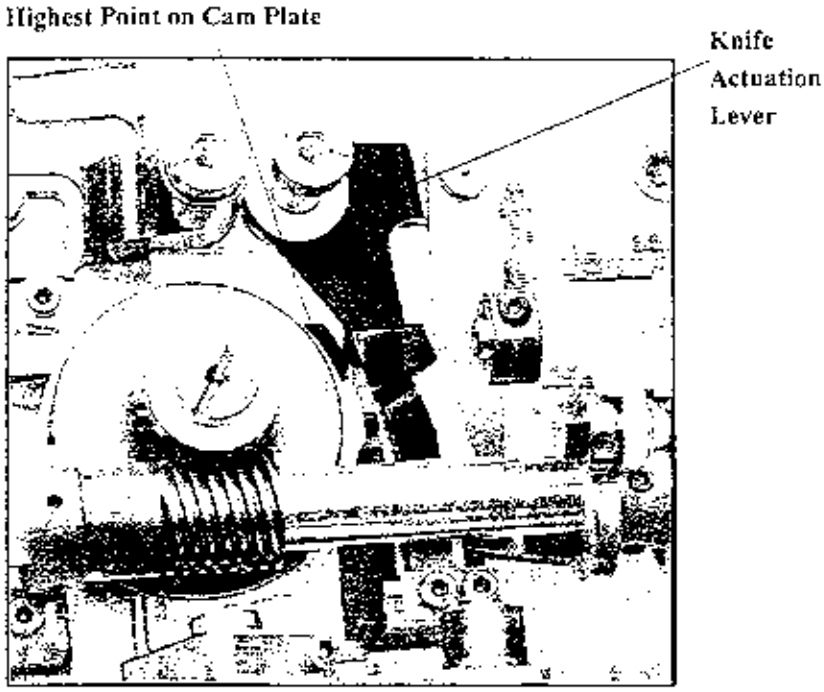




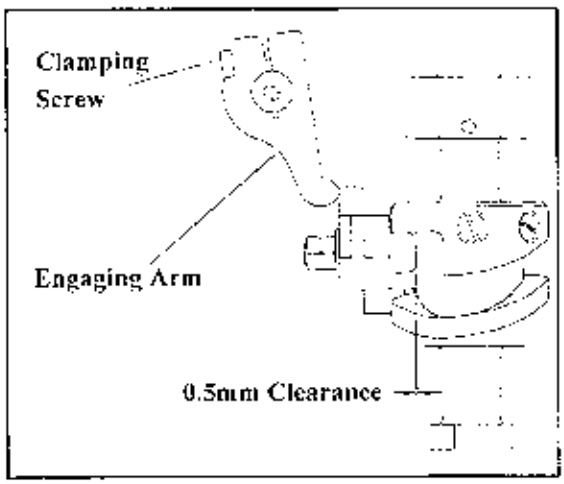
ADJUSTMENTS

Adjusting Knife Cam Pin Clearance to the Bottom of Knife Cam Groove

1. Manually *engage* the machine and *rotate* the hand wheel until the knife actuation lever reaches the highest point on the cam plate and the knife cam is aligned with the second timing mark (when rotated clockwise).



2. At this point, the knife cam pin will be fully engaged in the knife cam with a clearance of 0.5mm. If not: *loosen* the clamping screw and *position* the engaging arm, as necessary.



ADJUSTMENTS

Using the Micro Adjusting Screws for Rotational Adjustment

To prevent the knife from getting stuck in the material, the knife cam works to drive the knife through the material and then back out. If the knife cam is not doing this, and the knife is sticking in the material, the knife cam will need to be rotationally adjusted using the 2 micro adjusting screws.

1. *Loosen* the top micro adjusting screw and *tighten* the bottom one to move the knife cam counterclockwise, as necessary.

2. **Caution!** Adjusting the knife cam beyond the indicated timing marks (as shown in Figs. 1 & 2) may damage the machine.

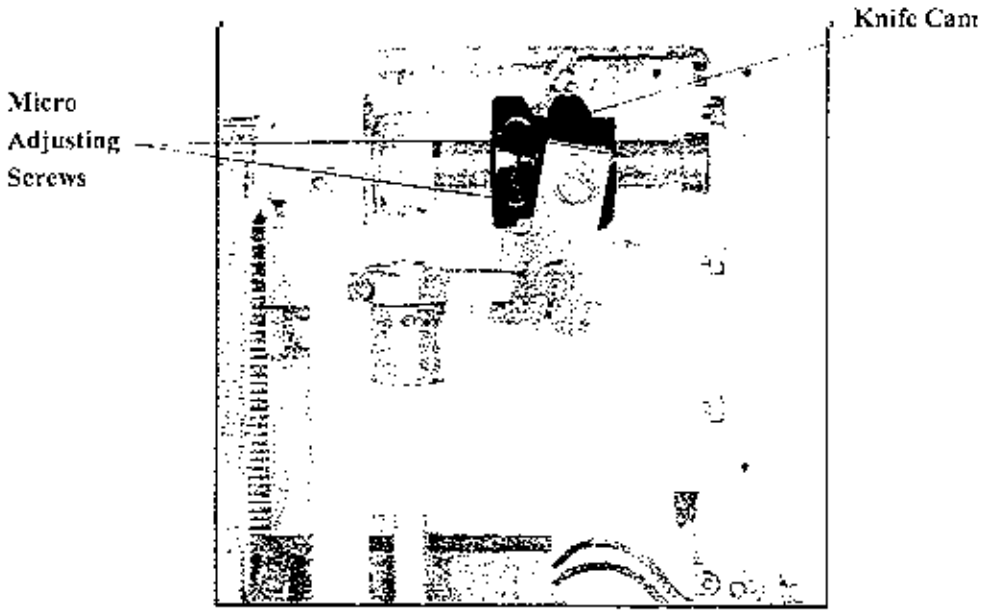


Figure 1

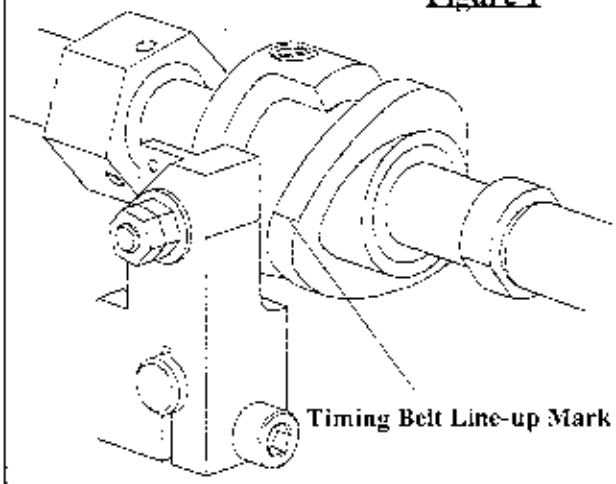
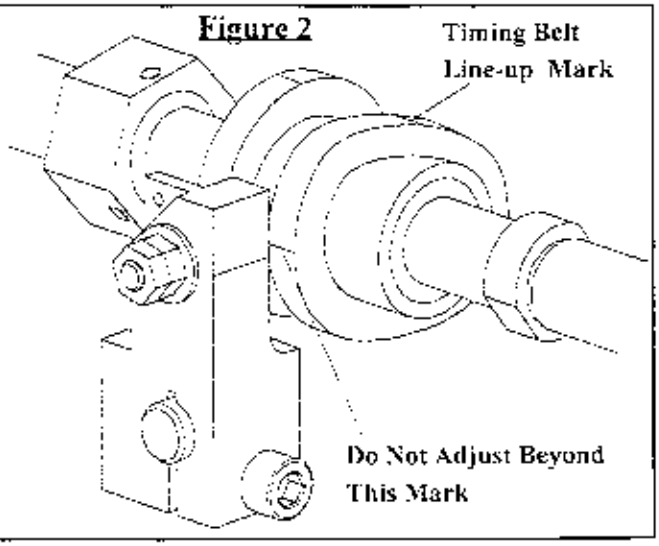


Figure 2



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ADJUSTMENTS

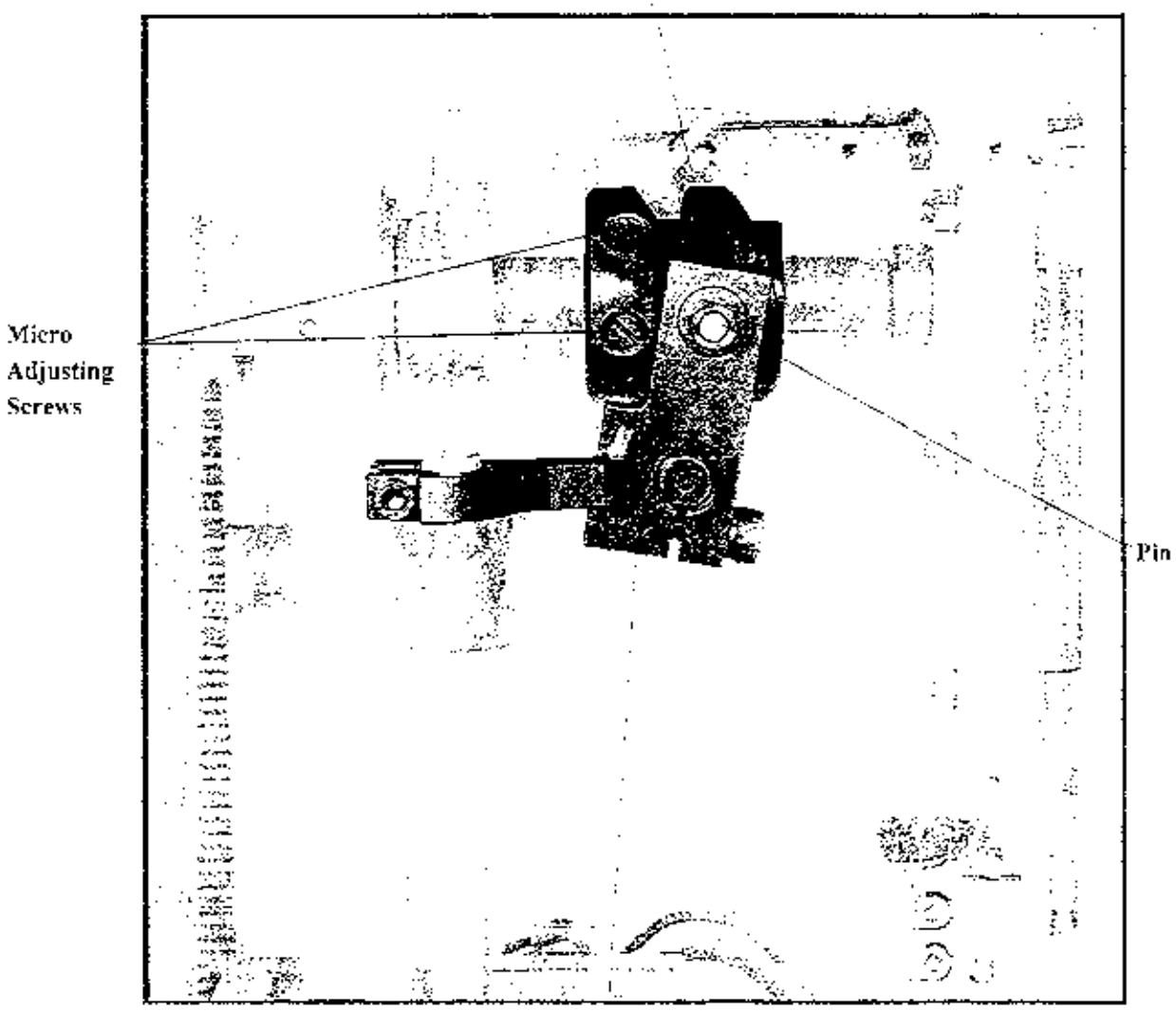
3. To check the correct rotational adjustment, *manually rotate* the cam to the point where the pin is ***fully*** engaged.

4. *Observe* the straight part of the cam track. In the correct position, the pin is fully engaged without ***any*** sideways motion of the knife cam lever.

5. *Check* to see whether the knife is driven upward slightly before the pin disengages from the cam at Home position. If not:

6. *Adjust* the rotational position of the knife cam using the micro adjusting screws, as necessary.

Knife Cam



Knife Cam Lever

ADJUSTMENTS

Adjusting the Bite Cam

1. *Make sure* the machine is in the home position.

2. *Put* the machine in the run position and *observe* the first needle penetration. The first stitch must be toward the operator (as shown in Figure 1). If the first needle penetration is to the rear (as shown in Figure 2), the bite cam is 180° out of position.

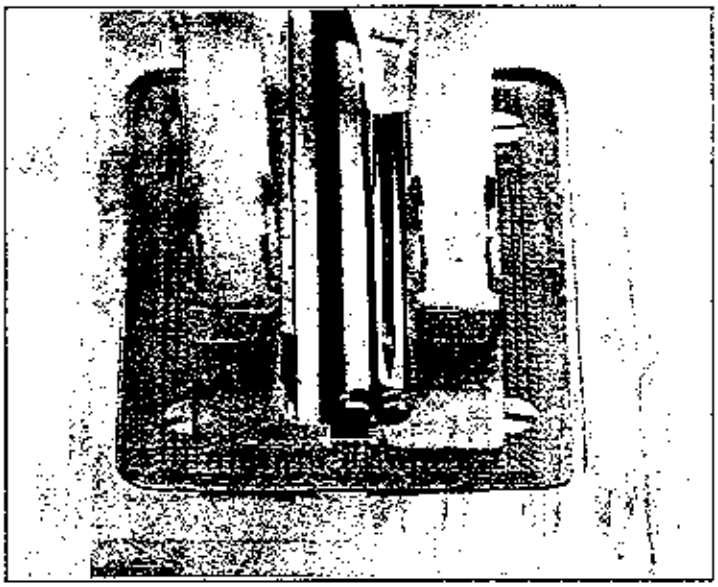
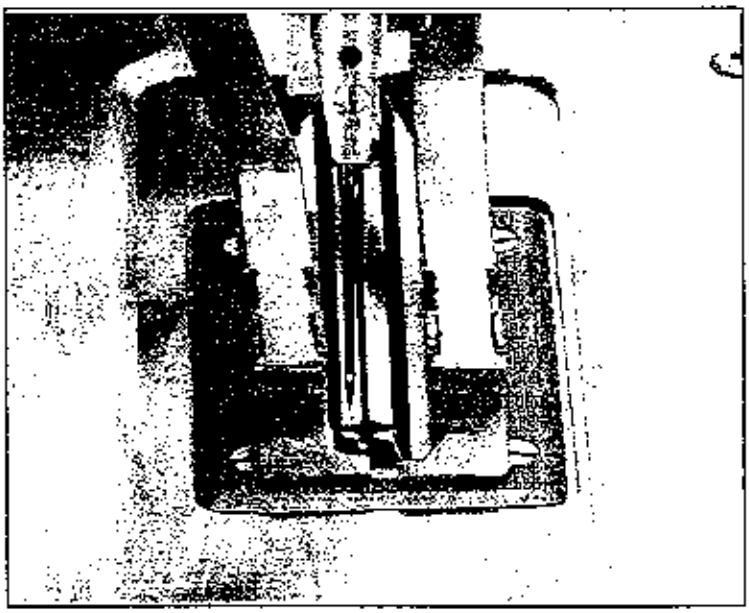


Figure 1

Needle bite should be in this direction on the first stitch.

Figure 2



Needle bite should not be in this direction.

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ADJUSTMENTS

The bite movement is preset with a set screw tightened into the shaft. The needle must have the same amount of travel moving up to and down from top dead center.

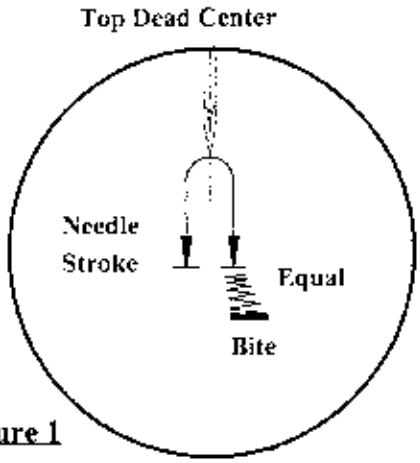
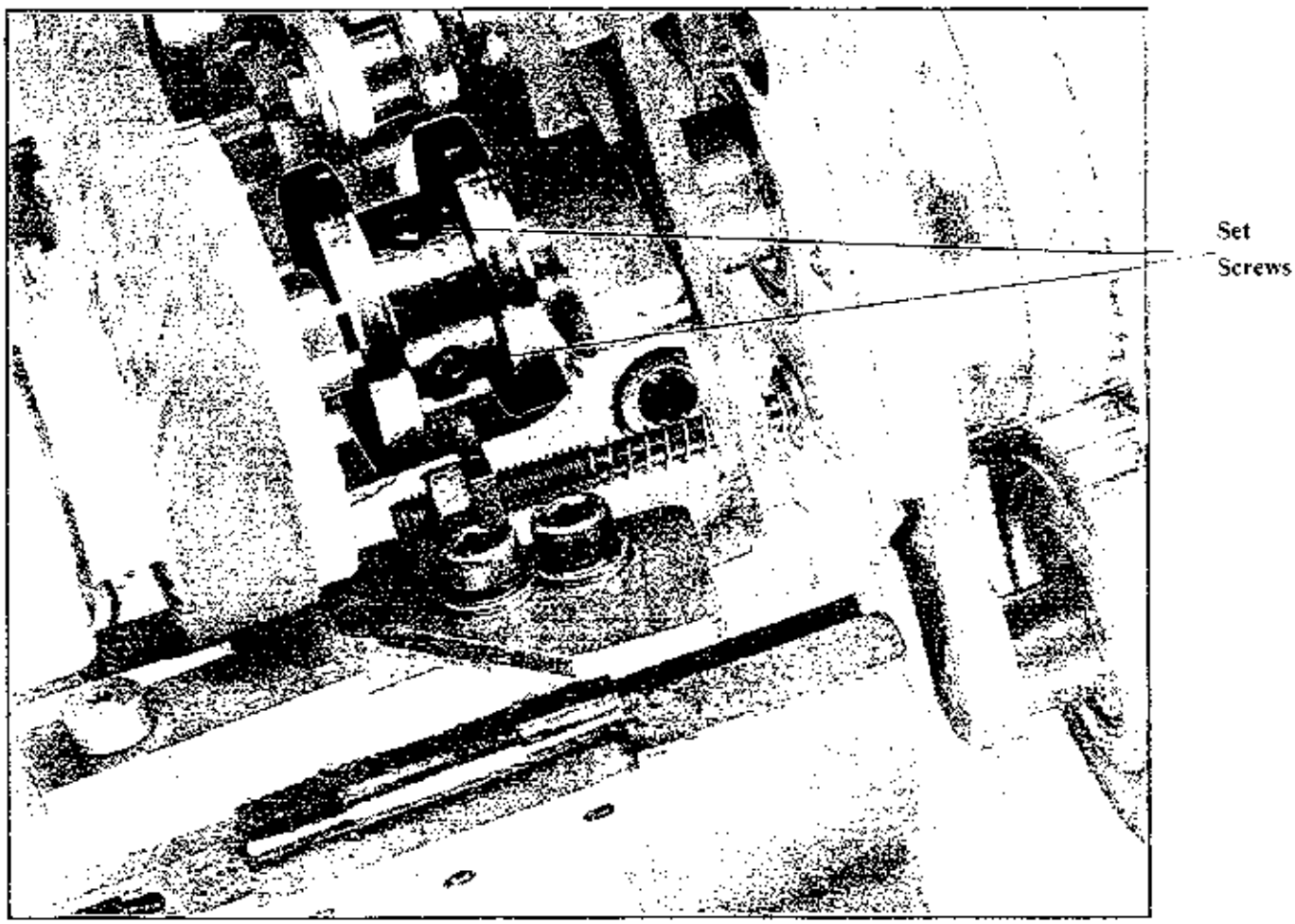


Figure 1
Bite Movement

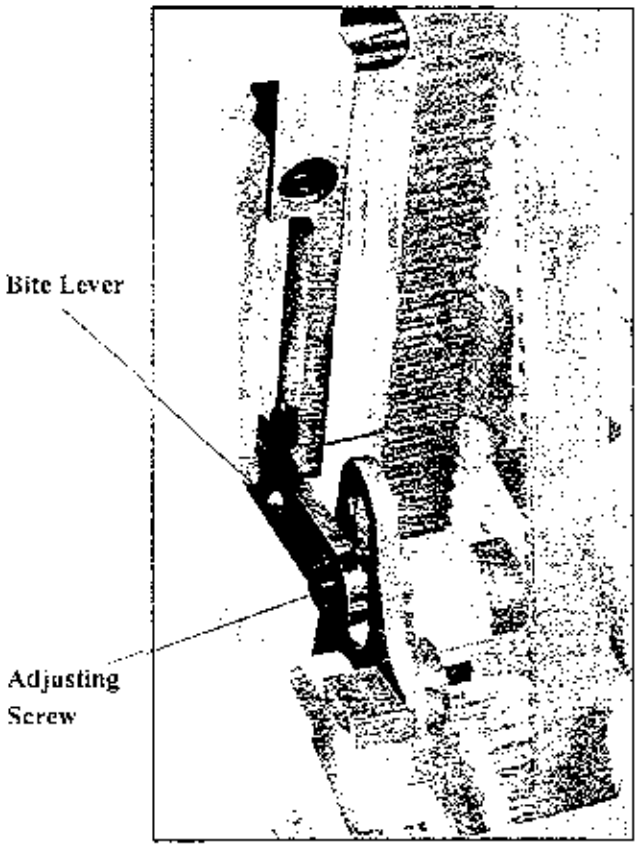


ADJUSTMENTS

Setting the Bite Width

The S-2000 is fitted with a regular bite throat plate which limits the bite range from a maximum of 2.3mm (3/32") to a minimum of 1.5mm (1/16"). To adjust the bite width within the above dimensions:

1. *Loosen* the adjusting screw.
2. For more bite width, *lower* the bite lever. For less bite width, *raise* the bite lever.
3. *Tighten* the adjusting screw.



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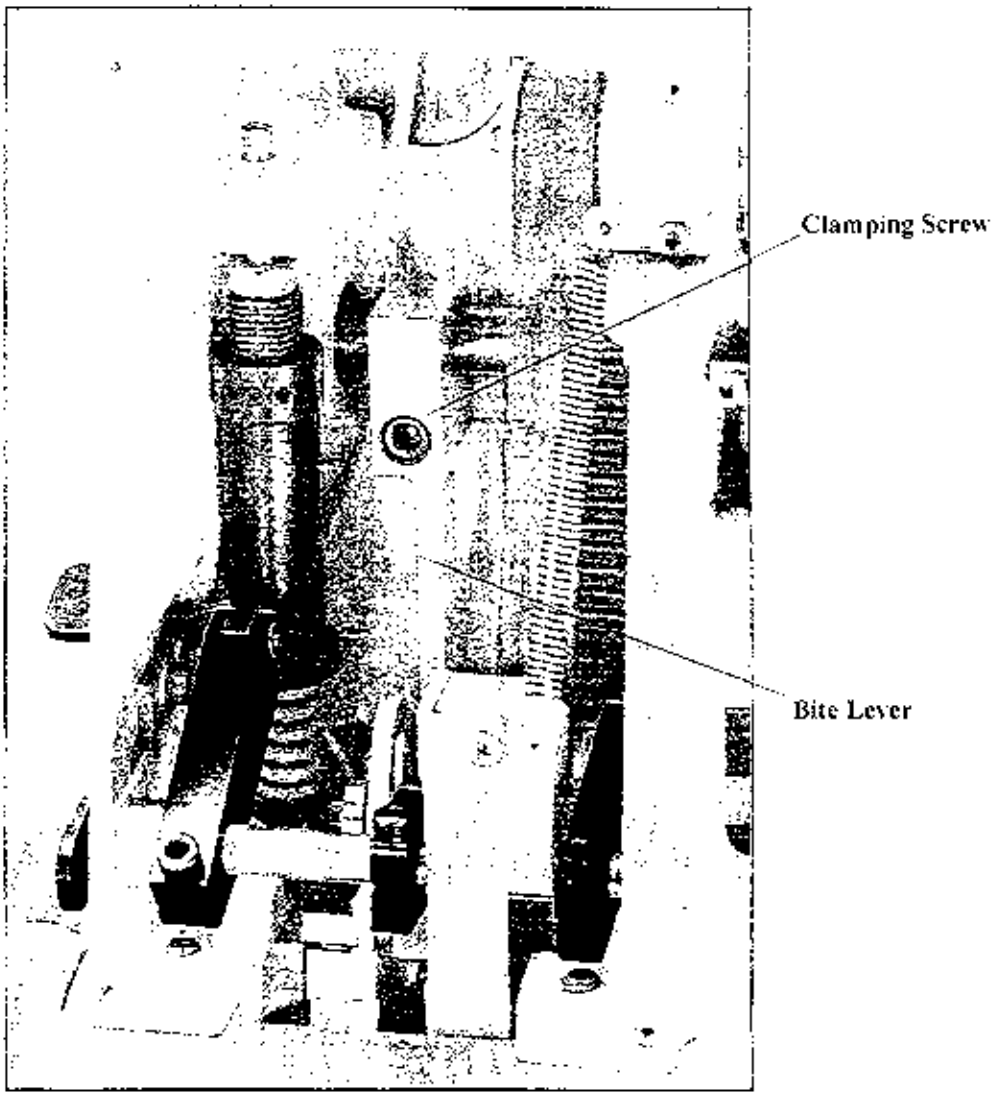
ADJUSTMENTS

Centering the Bite over the Throat Plate

1. *Loosen* the clamping screw on the bite lever and *center* the needle bite over the throat plate.

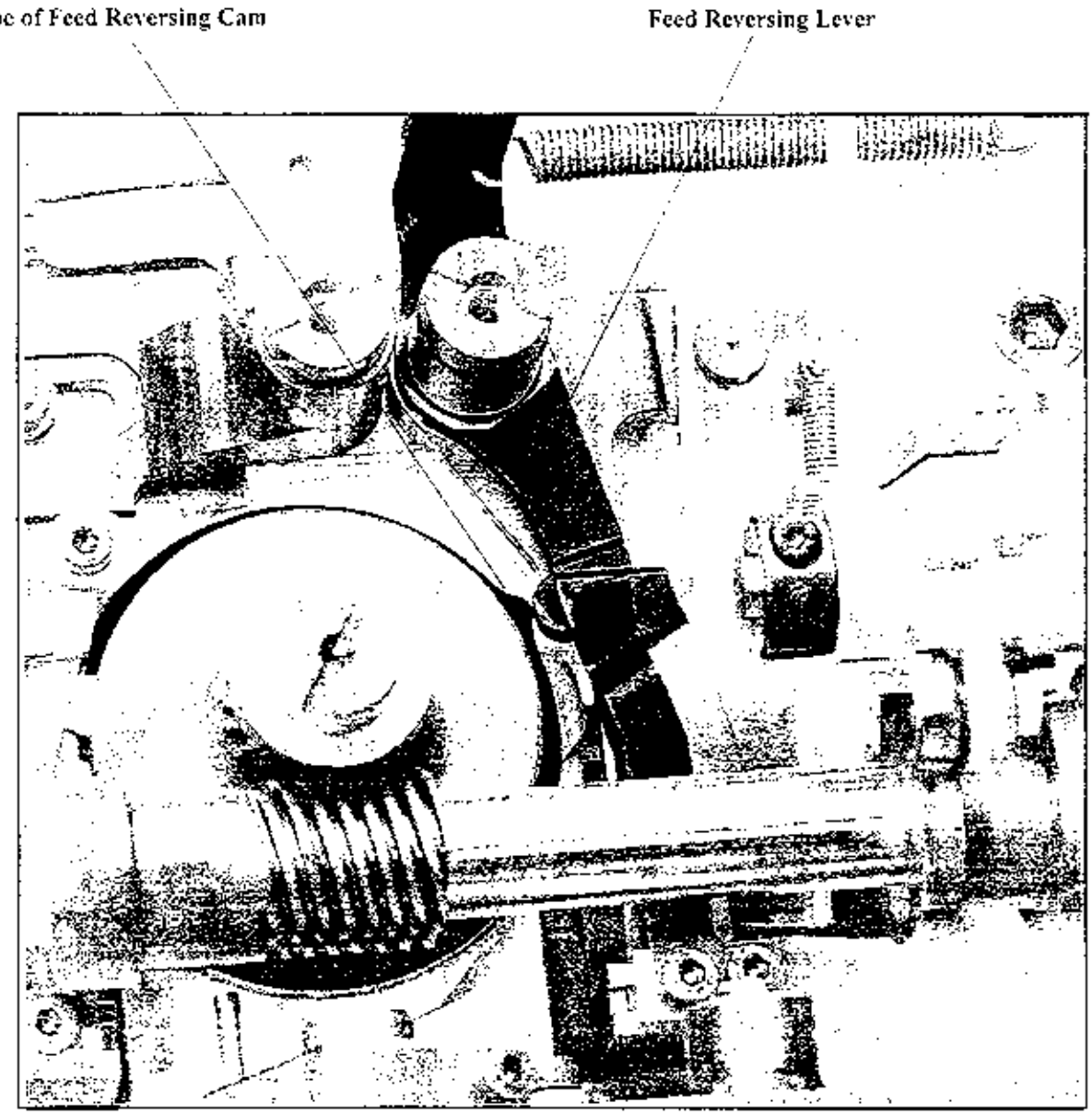
2. *Tighten* the clamping screw and then *check* the adjustment. *Repeat* adjustment as necessary.



ADJUSTMENTS

Adjusting the Feed Bracket Assembly

1. Manually *engage* the machine and *rotate* the hand wheel until the feed reversing lever is at the top of the lobe on the feed reversing cam and positioned for the first row of stitches.



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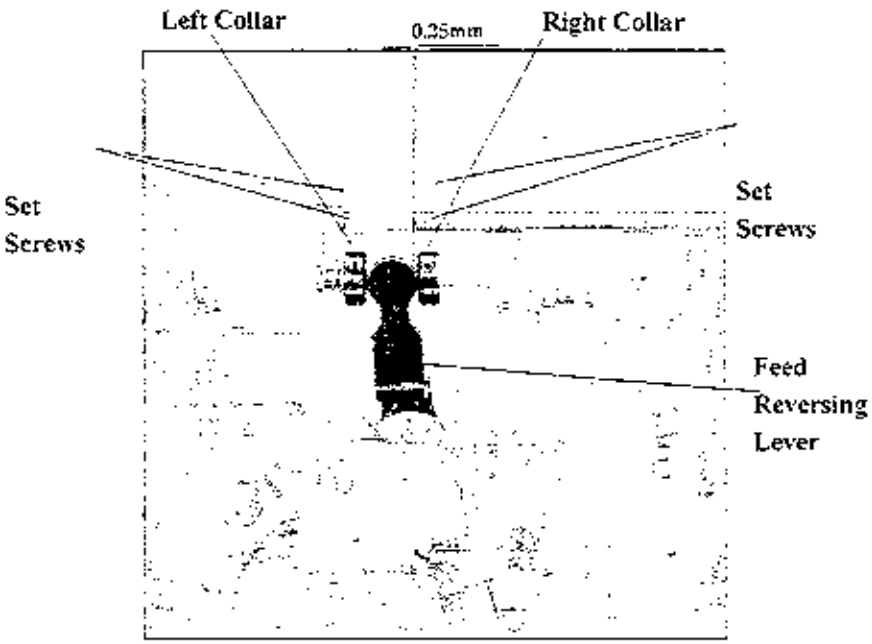
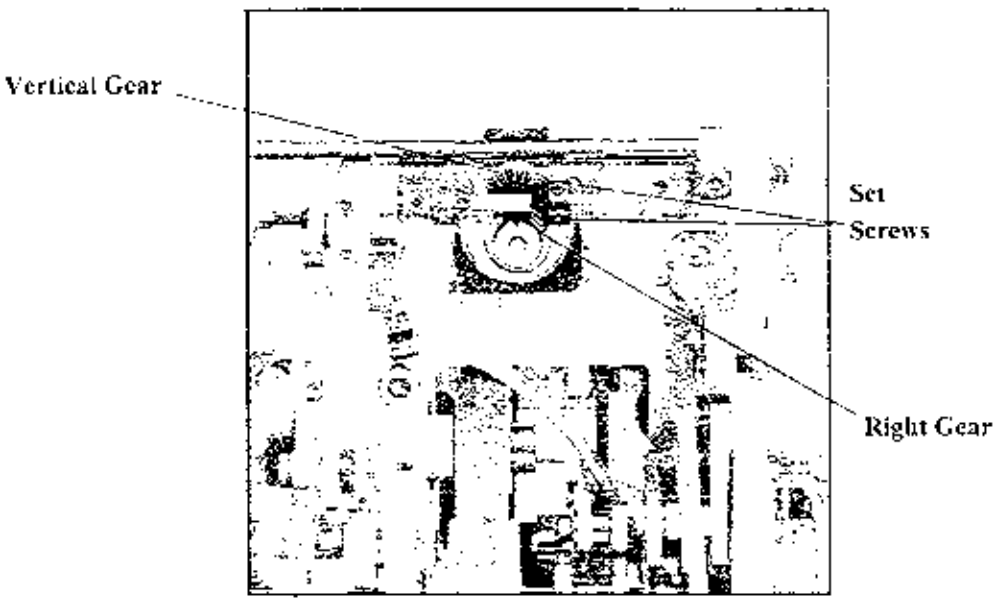
2. *Loosen* the two set screws on the right collar.

3. *Pressing* the end of the feed shaft, position the left collar against the feed reversing lever and apply a slight pressure to the spring. Maintaining the spring pressure, *move* the right collar against the feed reversing lever and *tighten* the set screws.

Note: The left collar contains set screw holes, do not insert screws and tighten the collar to the shaft. Ensure the left collar rotates freely.

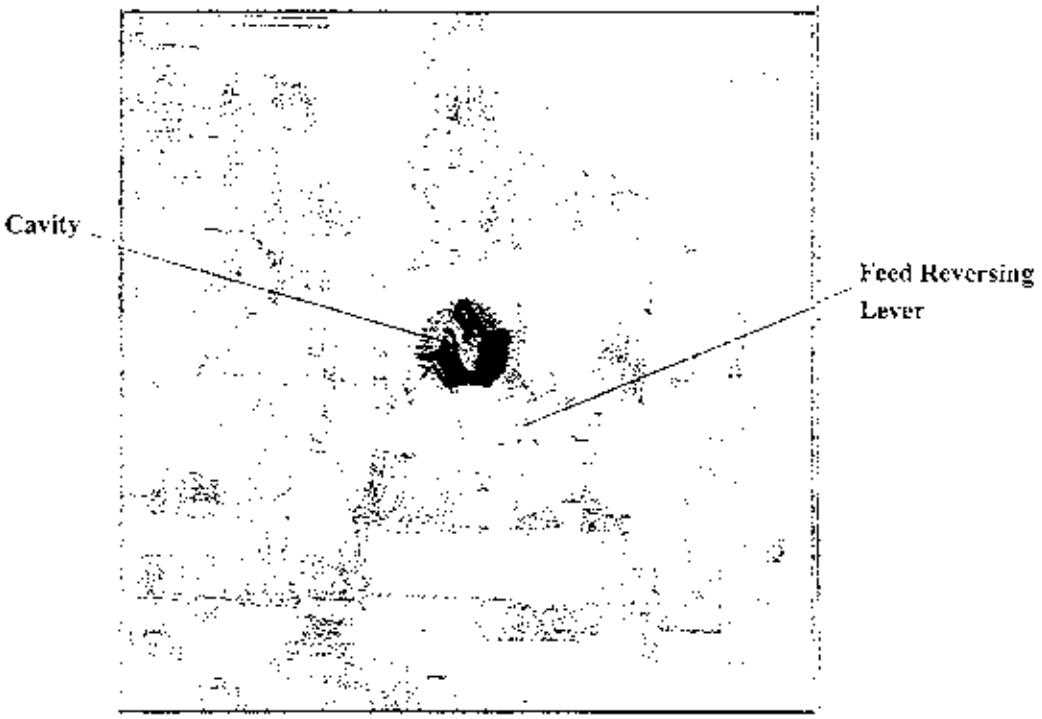


4. *Move* the right bevel gear until it engages with the vertical bevel gear, and *tighten* the set screw.



ADJUSTMENTS

6. *Rotate* the hand wheel until the feed reversing lever is positioned for the second row of stitches. (In this position, the feed reversing lever will fall into the cavity of the feed reversing cam, as shown.)

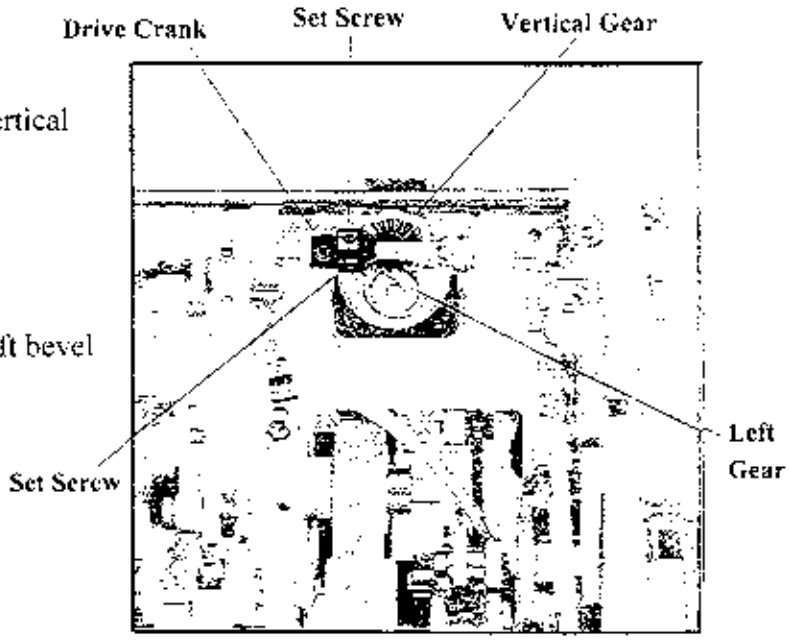


7. *Loosen* the bevel gear set screws.

8. *Set* the left bevel gear to engage with the vertical bevel gear and *tighten* the set screws.

9. *Loosen* the drive crank set screws.

10. *Move* the drive crank firmly against the left bevel gear and *tighten* the set screws.



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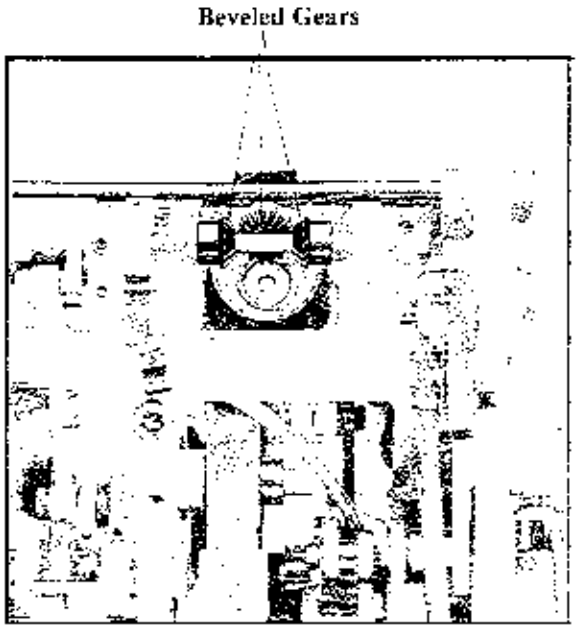
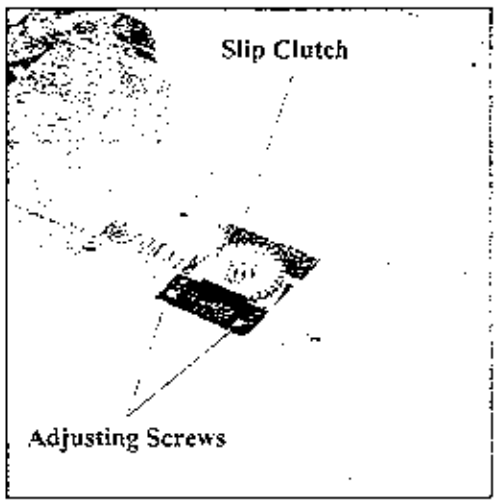
ADJUSTMENTS

11. *Rotate* the hand wheel to verify that all bevel gears are disengaged when machine is in the neutral (barring) position, as shown below.



Adjusting the Slip Clutch

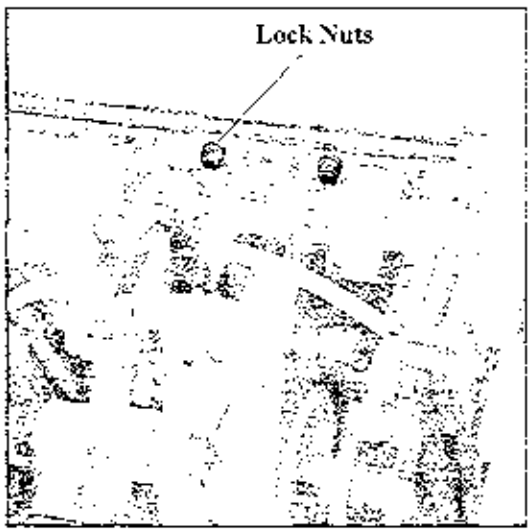
The slip clutch pressure is set at the factory and under normal conditions will not need adjusting. To adjust:



60 to 65 inch ounces of torque is required for the clutch to function correctly.

1. *Hold* the nut and *tighten* the adjusting screws with a torque screwdriver. *Apply* the same amount of pressure to both sides of the clutch.

Caution: If a torque screwdriver is not available, *adjust* until both ends of the screw are flush with the locknut.



Note: If *disassembling* a properly adjusted clutch, *count* the number of threads showing past the lock nuts and *install* the clutch to the original setting.

2. To eliminate backlash, *ensure* the feed brake spring is connected.

Caution: Too little torque will produce improper material feed.
Too much torque may allow valuable parts to break.

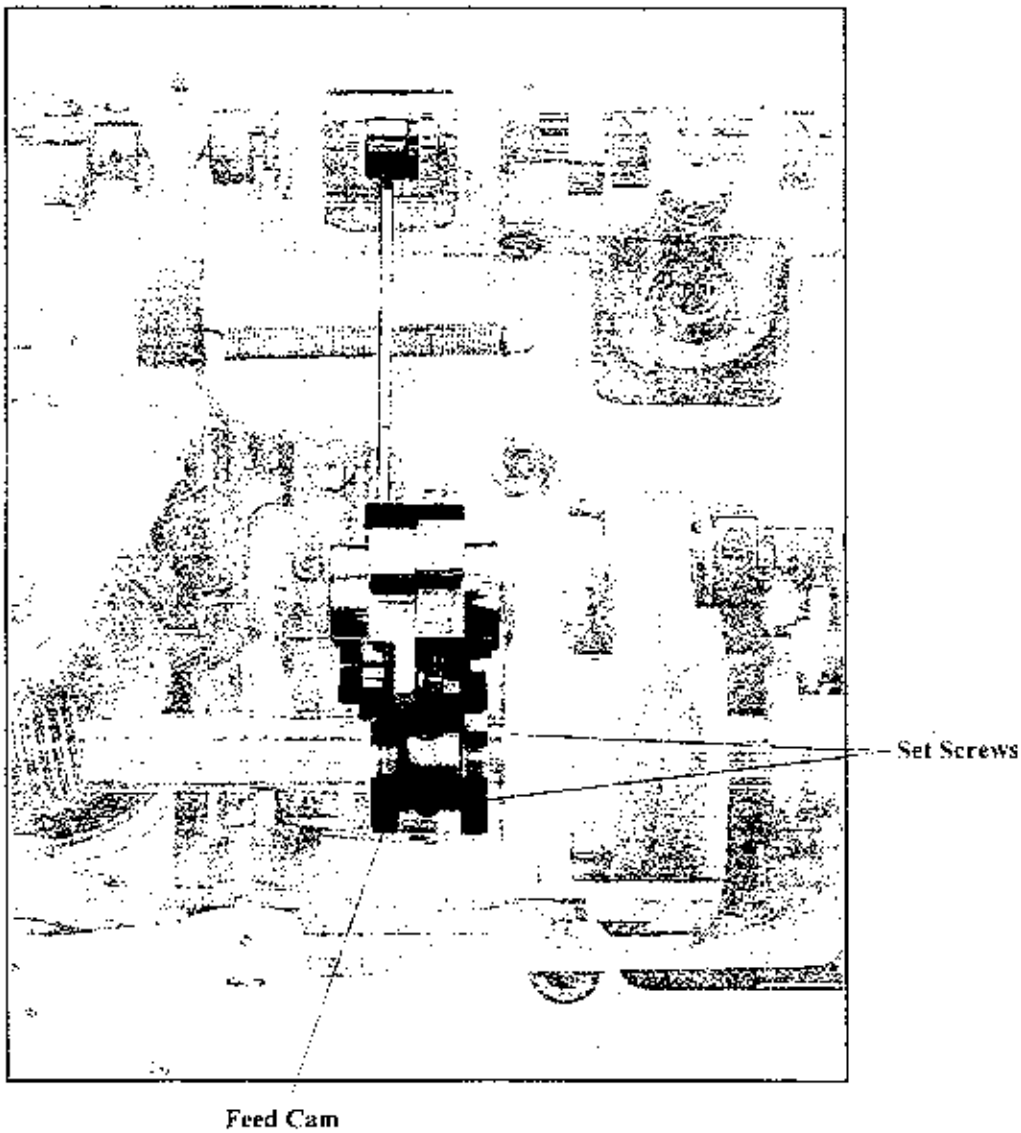
ADJUSTMENTS

Adjusting the Feed Timing

1. *Put* the machine in either the first or second row of stitches. (*Not* the barring position.)

2. *Loosen* the set screws on the feed cam and *adjust* the position of the feed cam to move the clamp plate when the needle is out of the material and the needle rises and falls the same distance Top Dead Center above the throat plate.

3. *Tighten* the set screws.



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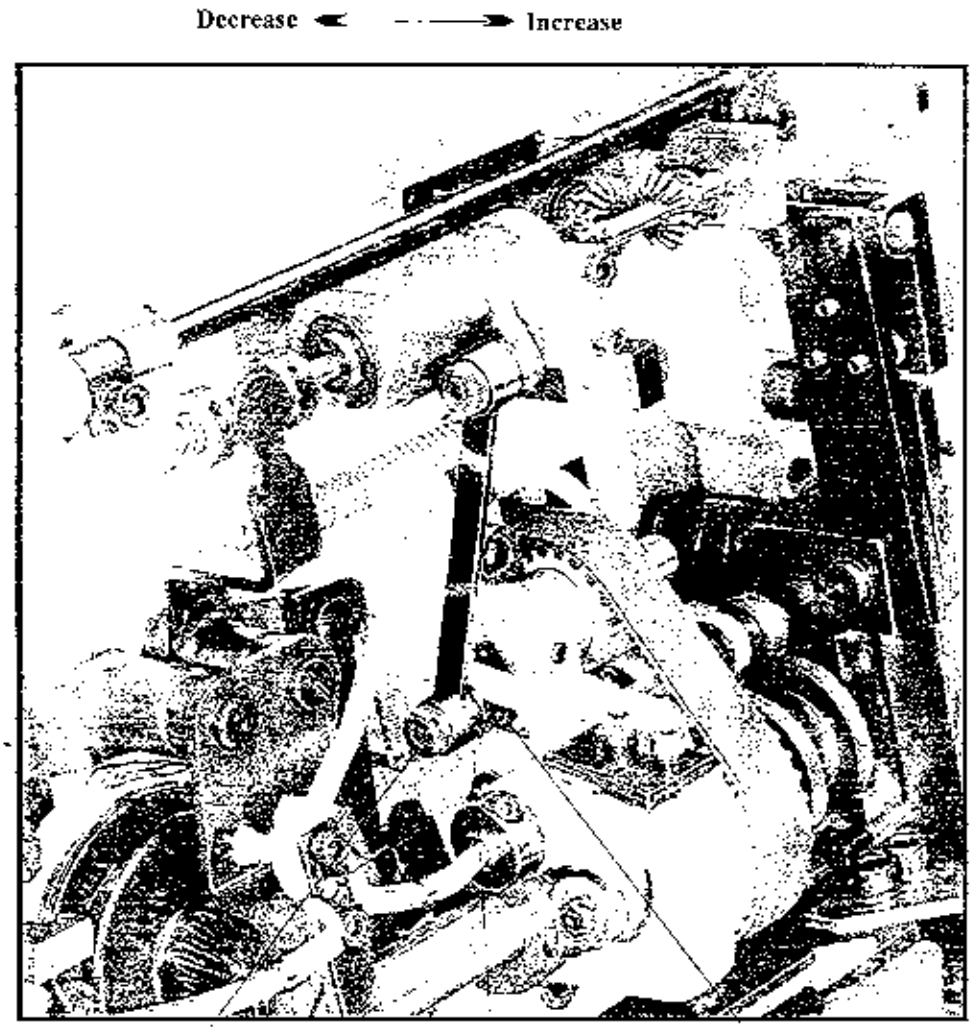
ADJUSTMENTS

Setting the Stitch Density

Adjust the feed connecting link position in the slot of the cam follower to obtain the desired stitch density.

1. *Loosen* the hex socket screw and *move* the link ***away*** from the bedplate ***to increase*** density. (Maximum density = 30 stitches per inch.) *Tighten* the hex socket screw.

2. *Loosen* the hex socket screw and *move* the link ***toward*** the bedplate ***to decrease*** density. (Minimum density = 10 stitches per inch.) *Tighten* the hex socket screw.



ADJUSTMENTS

Needle / Looper Adjustment

Figure 1

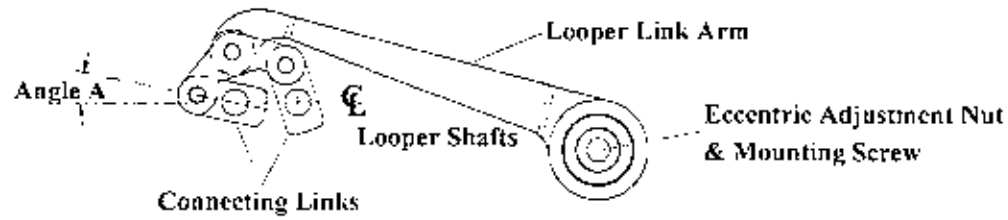
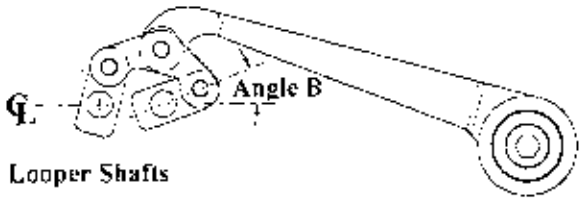


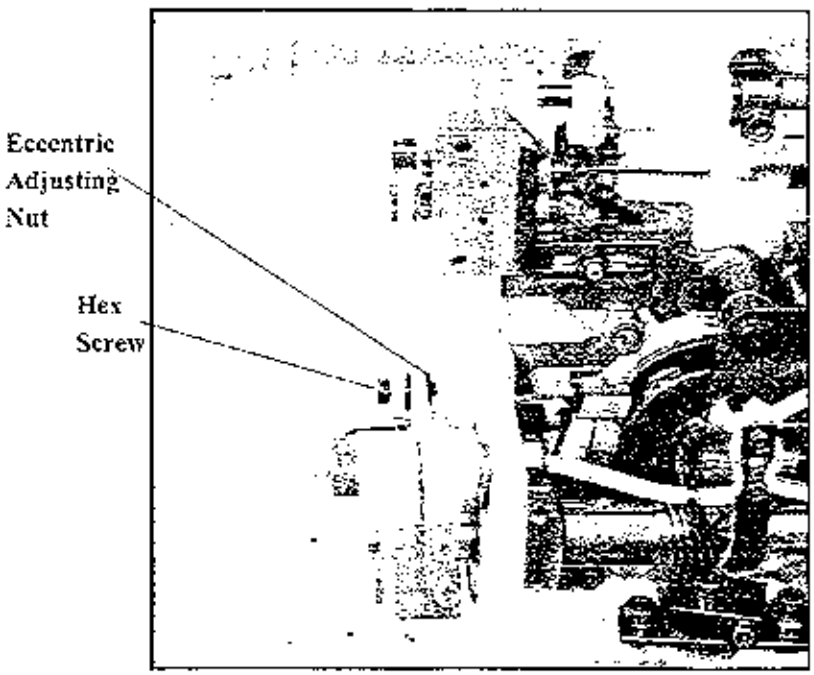
Figure 2



Balancing the Position of the Looper Connecting Links

1. *Observe* the position of the connecting links at both ends of looper link arm travel. Angle **A** should equal Angle **B**, as shown above in Figures **1** and **2**. To adjust:

2. *Loosen* the hex mounting screw and *rotate* the eccentric adjusting nut, as necessary.



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ADJUSTMENTS

Adjusting the Looper Position

Note: In the following adjustments, "first" and "second" loopers will be referred to as shown in Figure 3. "Front" and "back" strokes of the needle will be referred to as shown in Figure 4.

Figure 3

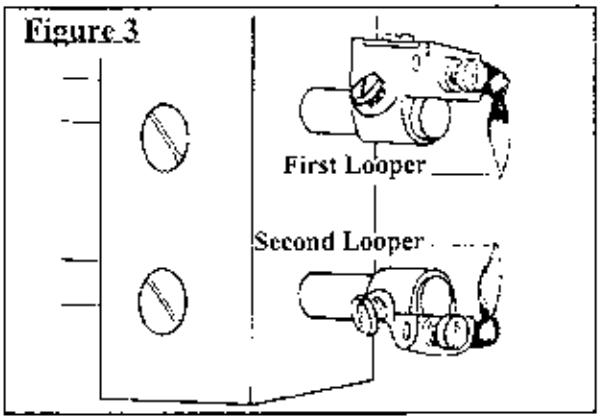
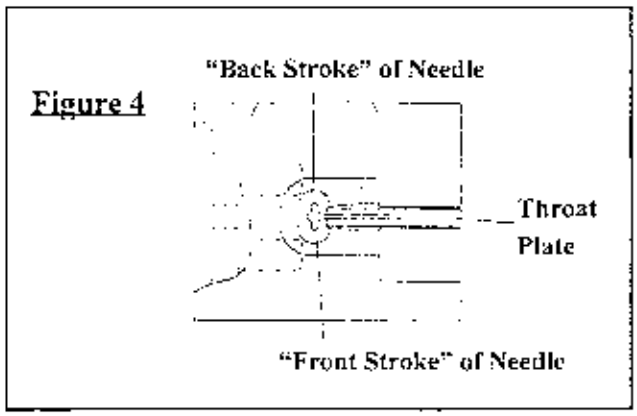


Figure 4

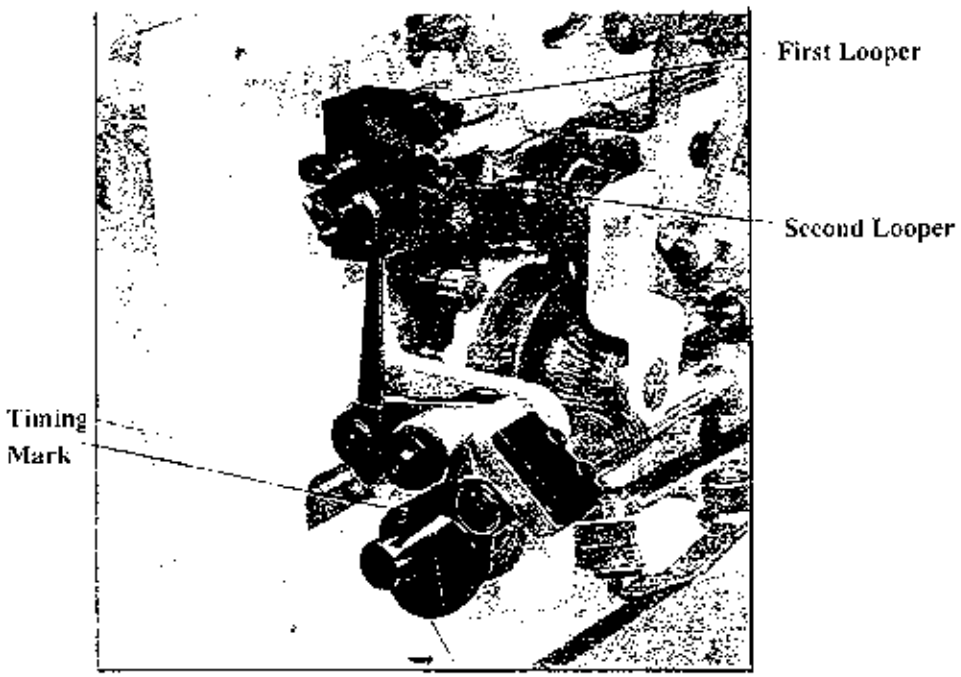


Before beginning the looper adjustments, *ensure* the needle is straight and inserted as high as it will go in the needle bar. *Make sure* the stitch bite is centered over the throat plate. (See page 1-40).

1. *Make sure* the machine is in the normal stopping position.

2. *Verify* the needle bar is in the Top Dead Center position, and the looper drive cam is rotationally set with the timing mark (shown below) towards the outside of the bedplate.

Note: If the timing mark is not on the outside, the cam is assembled backwards and must be removed and re-installed. Don't confuse the through hole with the timing mark.



ADJUSTMENTS

Note: See the needle bar and bell eccentric section for setting the Top Dead Center position.

3. *Set* the needle bar height to 16.0mm (5/8") from the top of the throat plate to the center of the needle eye.

4. *Mount* the first looper (with trim knife), and lightly *tighten*.

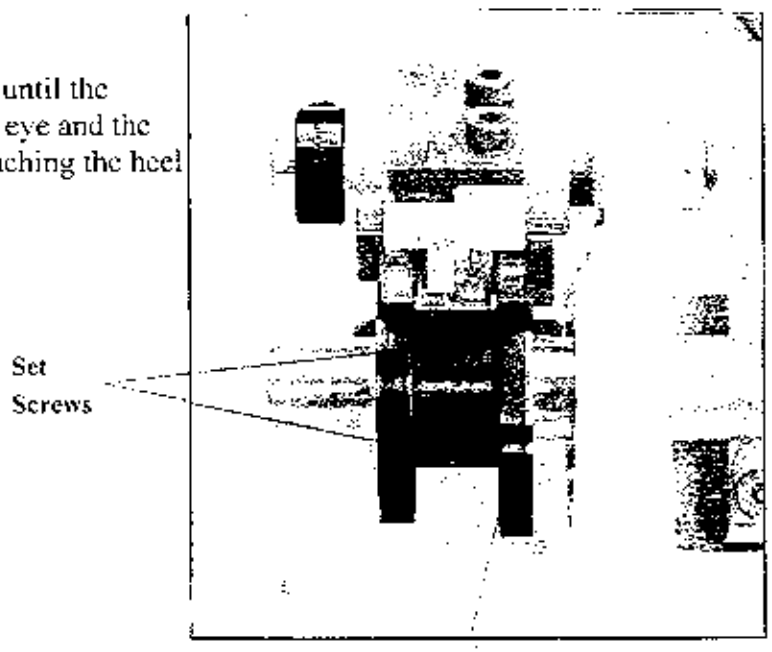
5. *Set* the looper and holder so the needle will pass on the inside (right side).

6. As a starting point, on the back stroke, *set* the point of the looper to cross at 3.97mm (5/32") rise. This should result in approximately 1mm dimension from the underside of the looper to the top of the needle eye.

7. If there is needle interference with the heel of the looper, *turn* the looper cam down to increase clearance between the needle and heel. (This will also move the looper to cross the needle at a higher position. *Adjust* the looper and looper holder rotationally to maintain a 1mm distance between the needle eye and the looper.)

8. If there is too much heel clearance, *turn* the looper cam up to decrease distance between the needle and heel. (This will also move the looper to cross the needle at a lower position. *Adjust* the looper and looper holder rotationally to maintain a 1mm distance between the needle eye and the looper.)

NOTE: *Alternate* between steps 7 and 8 until the looper crosses the needle 1mm above the eye and the needle clearance is minimum, but **not** touching the heel



Looper Cam

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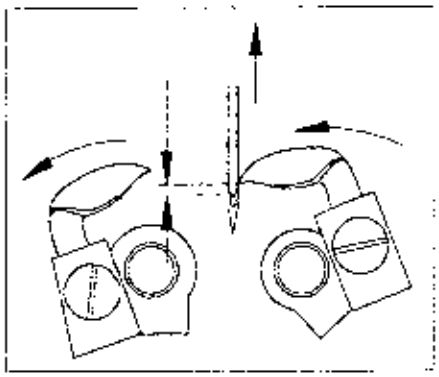
ADJUSTMENTS

9. *Set* the second looper with 1mm distance between the tip of the looper and the top of the needle eye at the "crossover" point. *Check* for minimum clearance at the heel.

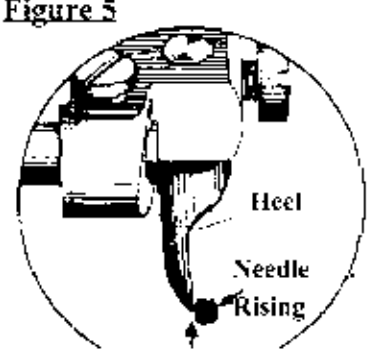


10. *Set* the loopers to point inward at a ***very slight angle*** toward the needle and *position* the looper holders so side clearance exists between the loopers and the needle, as shown in Figures 5 and 6.

11. *Thread* the needle, *place* the material under the clamps, *tip* the machine back on its hinges and *rotate* the drive pulley forward while observing the sewing action.

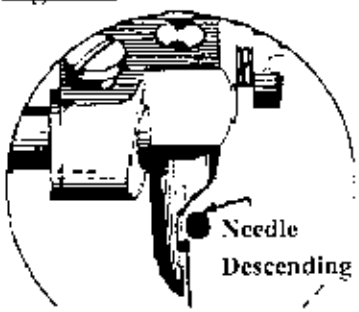
12. Figures 7 through 12 (viewed in succession) show the way in which first one looper, and then the other looper, must engage and disengage the thread in a continuous sequence.

Figure 5



Point of each looper to be set very close to needle without touching it.

Figure 6



Side of each looper to clear the needle by 1/64" or less.

Note: Because both loopers function similiarly, the instructions and pictures which follow *apply to both the first and second loopers.*

13. When the needle has risen from the bottom of the stroke, the point of the looper should enter the loop just above the eye of the needle (as shown in Figures 7 and 10).

Figure 7

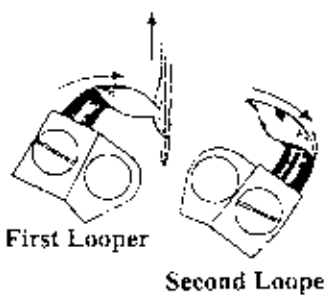
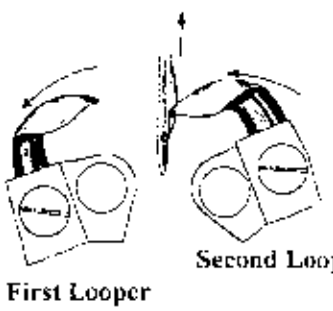


Figure 10



ADJUSTMENTS

14. Thread loop must then slide freely to the heel of the loopers. where it remains until the needle descends on the next stroke (see Figures 8 and 11).

Figure 8

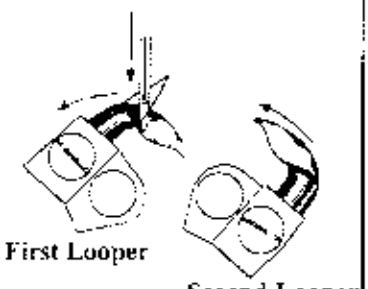
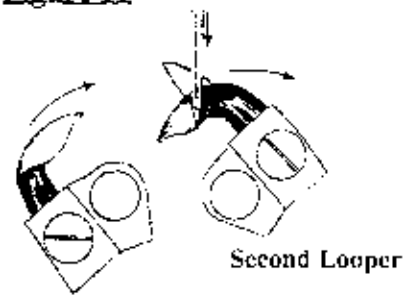


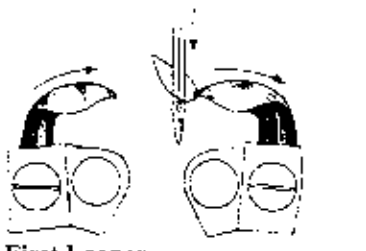
Figure 11



15. As the needle descends, it enters the thread loop, which is held by the looper (as shown in Figures 9 and 12). The needle descends reasonably close to the heel of the looper ***without touching it***. The thread loop must start to slide down off the looper shortly after the point of the needle has descended below the bottom of the loop.

Figure 9

Figure 12



16. As the needle continues to descend, the thread loop should slide off the looper and be drawn up out of reach of the opposite looper on the succeeding stroke.

Note: *Figures* **7-12** *apply to standard sewing conditions with a 2.3mm (3/32") stitch bite and normal cutting space between rows of stitches.* ***Should stitch bite or cutting space be abnormally wide or narrow, it may be necessary to adjust the loopers.***

NOTE: Any changes in stitch bite or centralization of the needle vibration which appreciably alter the needle position require corresponding adjustment of the loopers.

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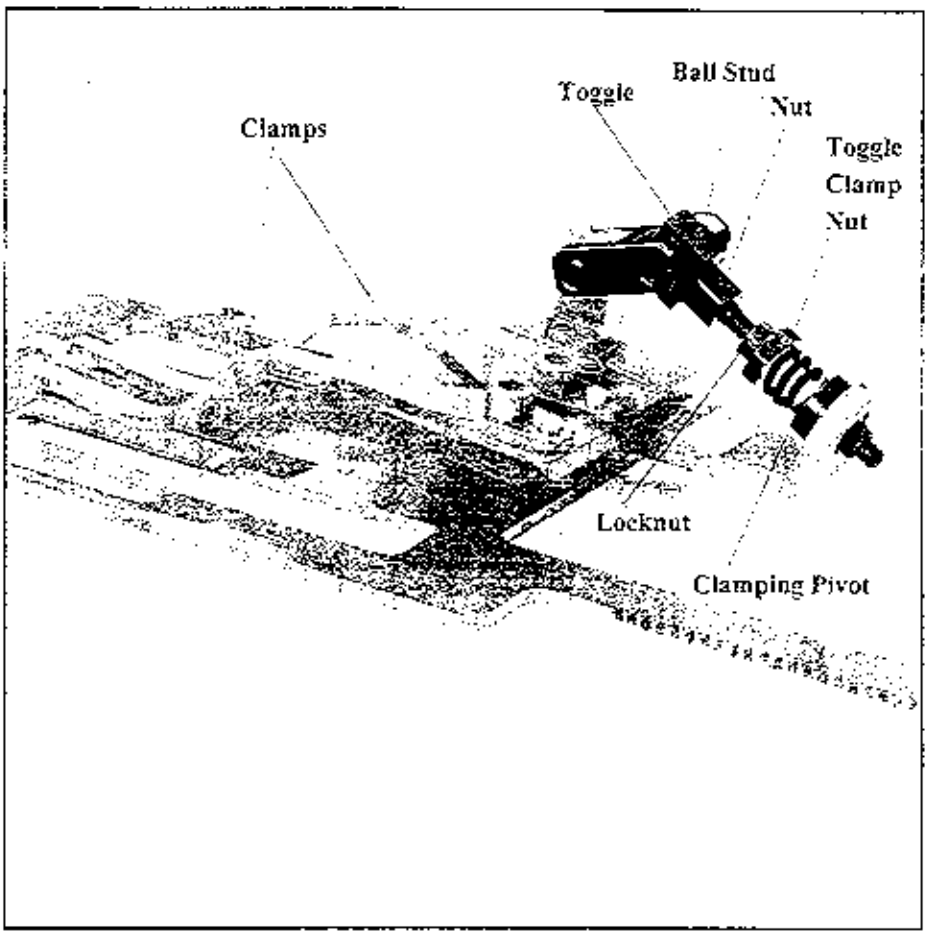
ADJUSTMENTS

Clamping and Unclamping



Adjusting the Toggle

1. *Remove* the clamp plate assembly from the machine.

2. Manually *close* the toggle until it reaches the over center position with the ***clamps down.***

3. *Adjust* the toggle nut in or out, as necessary, to achieve correct clamping pressure.

4. To *check* pressure: manually *raise* the clamps, *place* a scrap of material in the clamping area and *lower* the clamps. *Pull* on the material. ***If the material pulls easily out from under the clamps, clamp pressure must be increased.***

ADJUSTMENTS

Increasing and Decreasing Clamp Pressure

1. To increase clamp pressure, *loosen* the lock nut and *rotate* the toggle clamp nut tighter against the spring, as necessary.

2. To decrease clamp pressure, *rotate* the toggle clamp nut away from the spring, as necessary.

3. *Tighten* the lock nut.

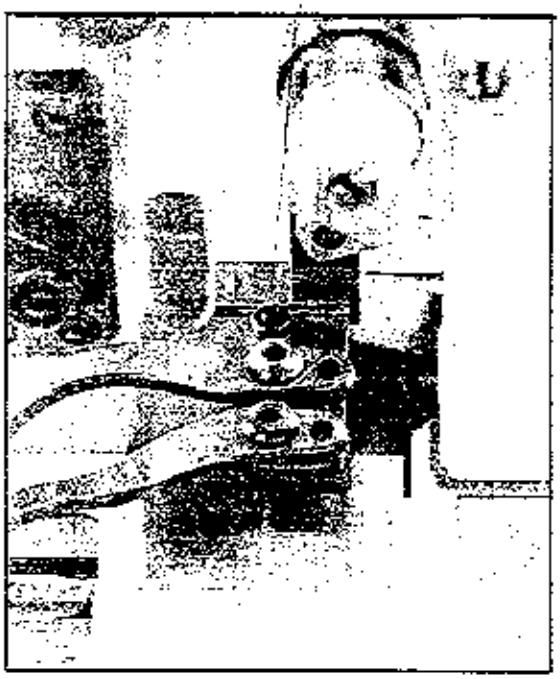
Setting the Clamp Height

Clamp height is correct when the needle in the stop position is ***slightly above*** the underside of the clamp feet. To adjust:

1. *Loosen* the adjusting nut and *turn* the adjusting screw in or out, as necessary.

2. *Tighten* the adjusting nut.

Adjusting Screw



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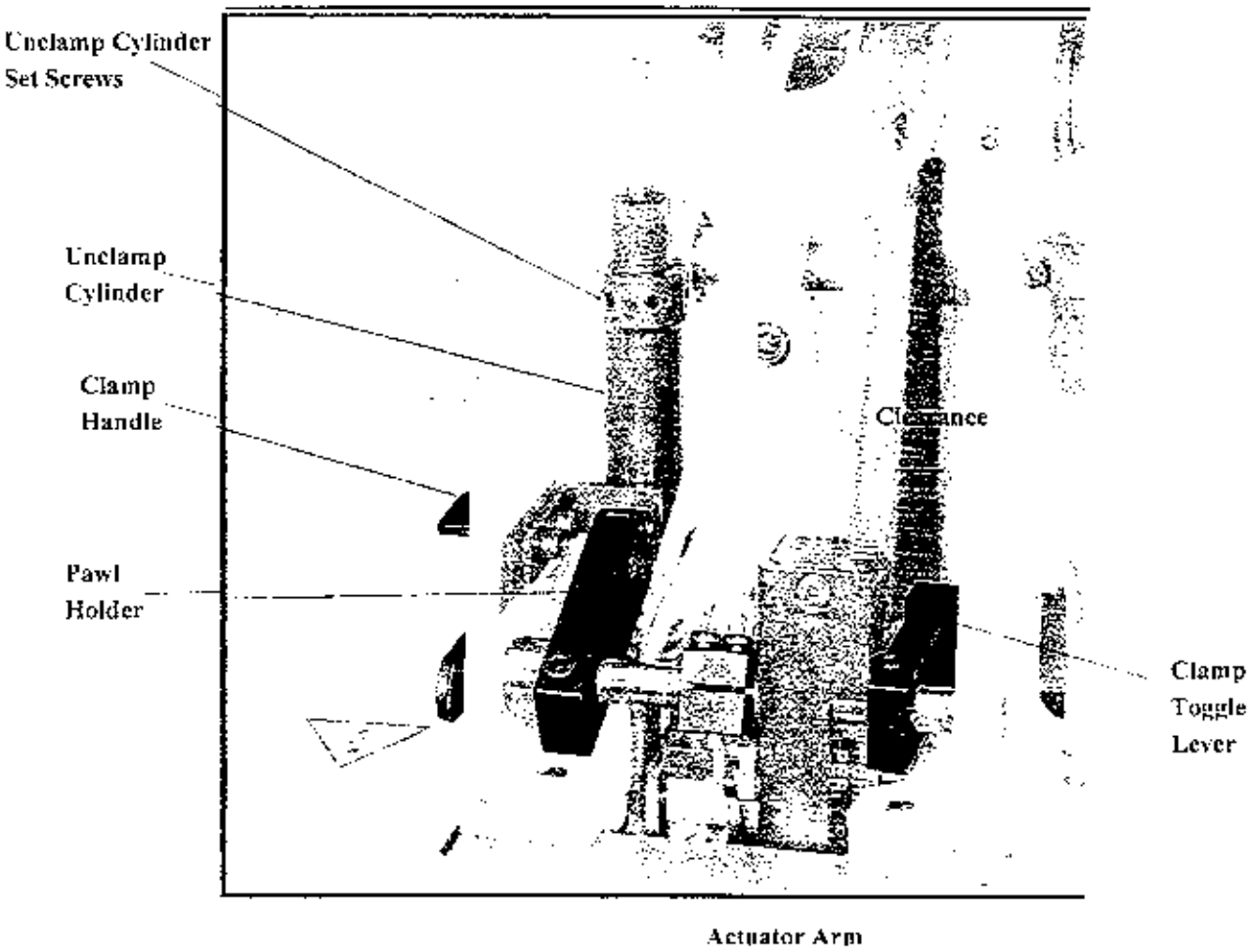
ADJUSTMENTS

Manual Clamping



1. *Loosen* clamping screws on the pawl holder, actuator arm and toggle lever.

2. *Holding* the clamp handle horizontal, manually *move* the toggle lever down until the clamp feet contact the mat and the toggle is closed in the over-center position.

3. *Ensure* there is approximately 2mm clearance between the belt and the toggle lever, and *make sure* the clamp handle and shaft assembly are tight against the outside of the casting.

4. *Tighten* the screw on the clamping toggle lever.

ADJUSTMENTS

Automatic Clamping

Automatic clamping is set at the factory, and should occur when the operator presses down on the small foot pedal. To adjust:

1. *Move* the actuator arm to lightly touche the automatic clamping cam and the roller engages in the slot.

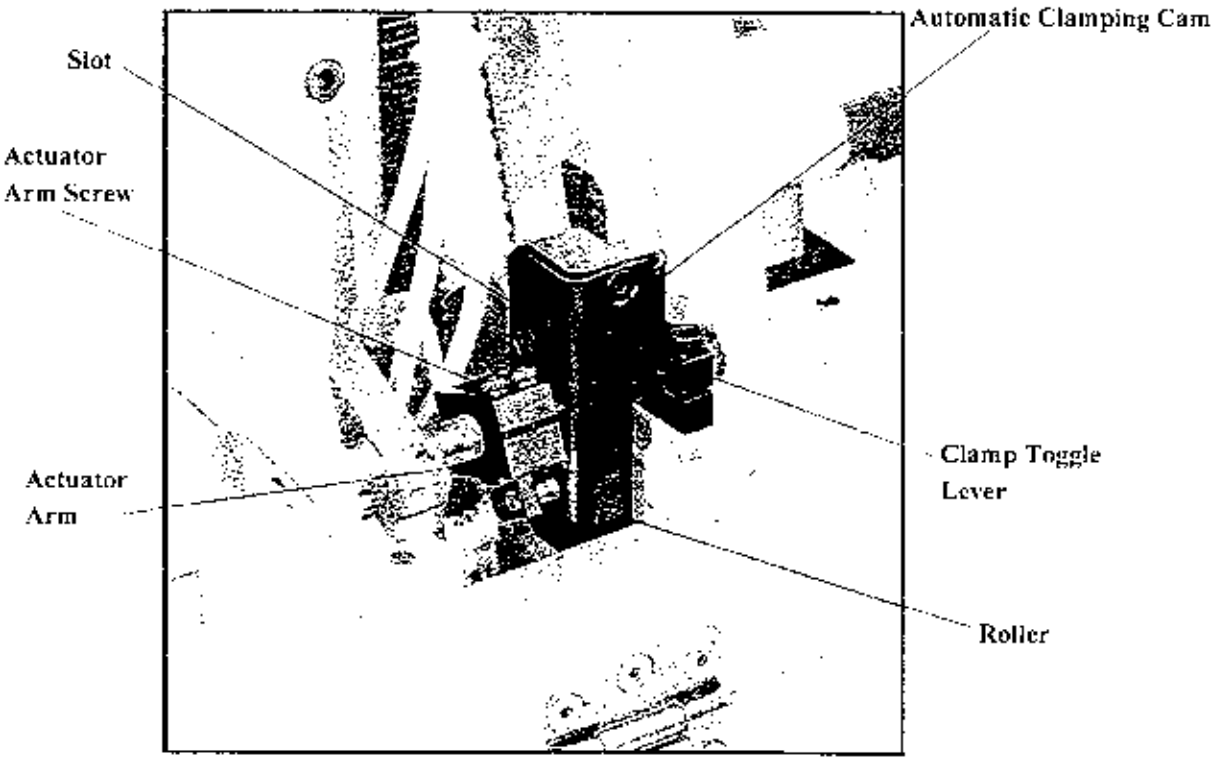
2. *Make sure* the automatic clamping cam is retained between the clamp toggle lever and the actuator arm, but can still move freely.

3. Rotationally *position* the roller in the clamping cam forward, as necessary, to provide the correct toggle over center locking action of the clamping assembly.

NOTE: Roller is shown disengaged in this view for clarity. Roller should be engaged in the slot when making this adjustment.

4. If the clamping action is not correct, *repeat* steps 1-3.

5. *Tighten* the screws on the clamping actuator arm.



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ADJUSTMENTS

Automatic Unclamping

1. Using the clamping handle, *close* and *lock* the clamps down.

2. *Loosen* the adjusting screws on the pawl retainer and *move* it in towards the unclamp cylinder to within a 0.5mm clearance (as shown in Fig. 1, Detail A).

3. *Loosen* the set screw on the unclamp cylinder and *adjust* unclamp cylinder up or down, as necessary, so the upper edge of the flange is within 0.5mm of the underside of the pawl retainer. (See Fig. 1, Detail B)

4. *Tighten* the set screw against one of the 4 flats on the adjusting screw.

Note: Before adjusting the position of the pawl holder, *rotate* the main shaft until it reaches 90 degrees before the home position and fully compresses the stop bolt spring.

5. *Adjust* the pawl holder fully to the left, against the spacer, with the clamp handle *pushed* tightly against the casting.

6. *Rotate* the pawl holder downward until the lower edge of the pawl is positioned 0.5mm above the unclamp cylinder flange.

7. *Tighten* the pawl holder screw.

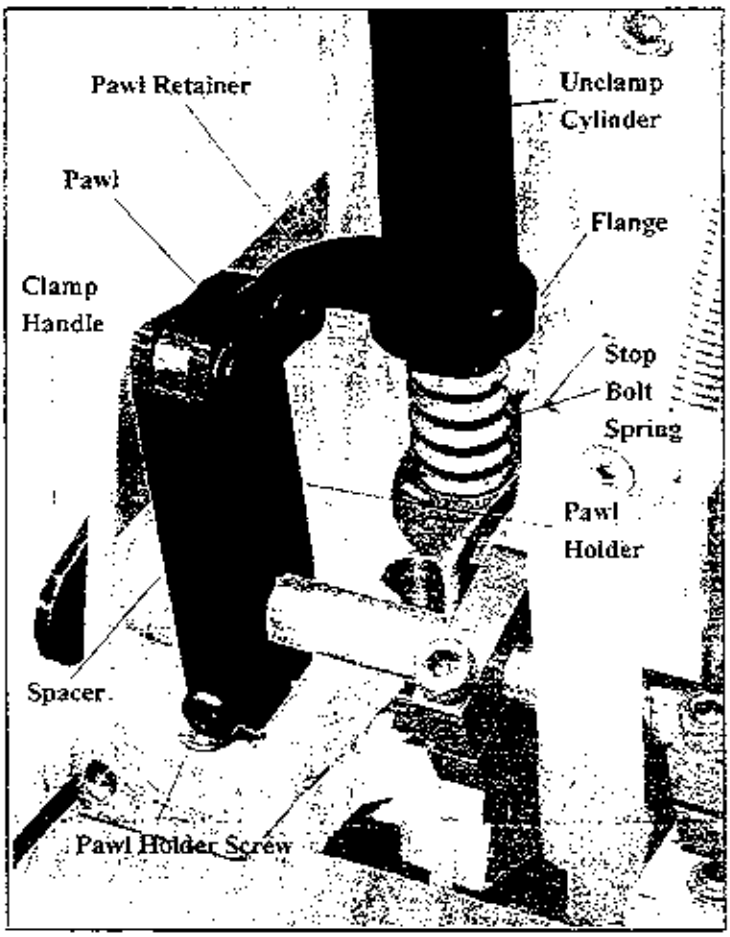
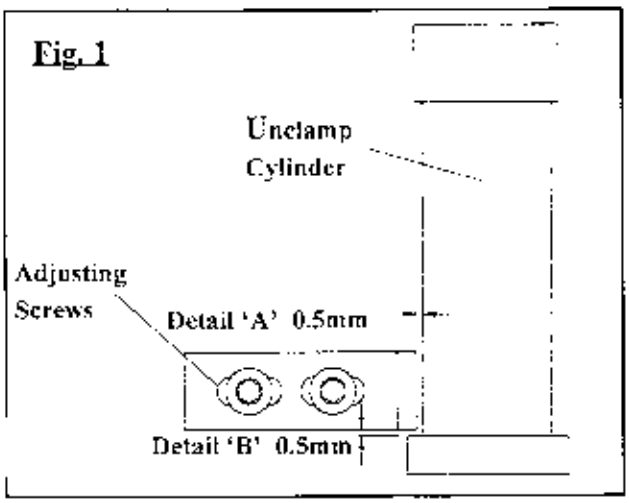
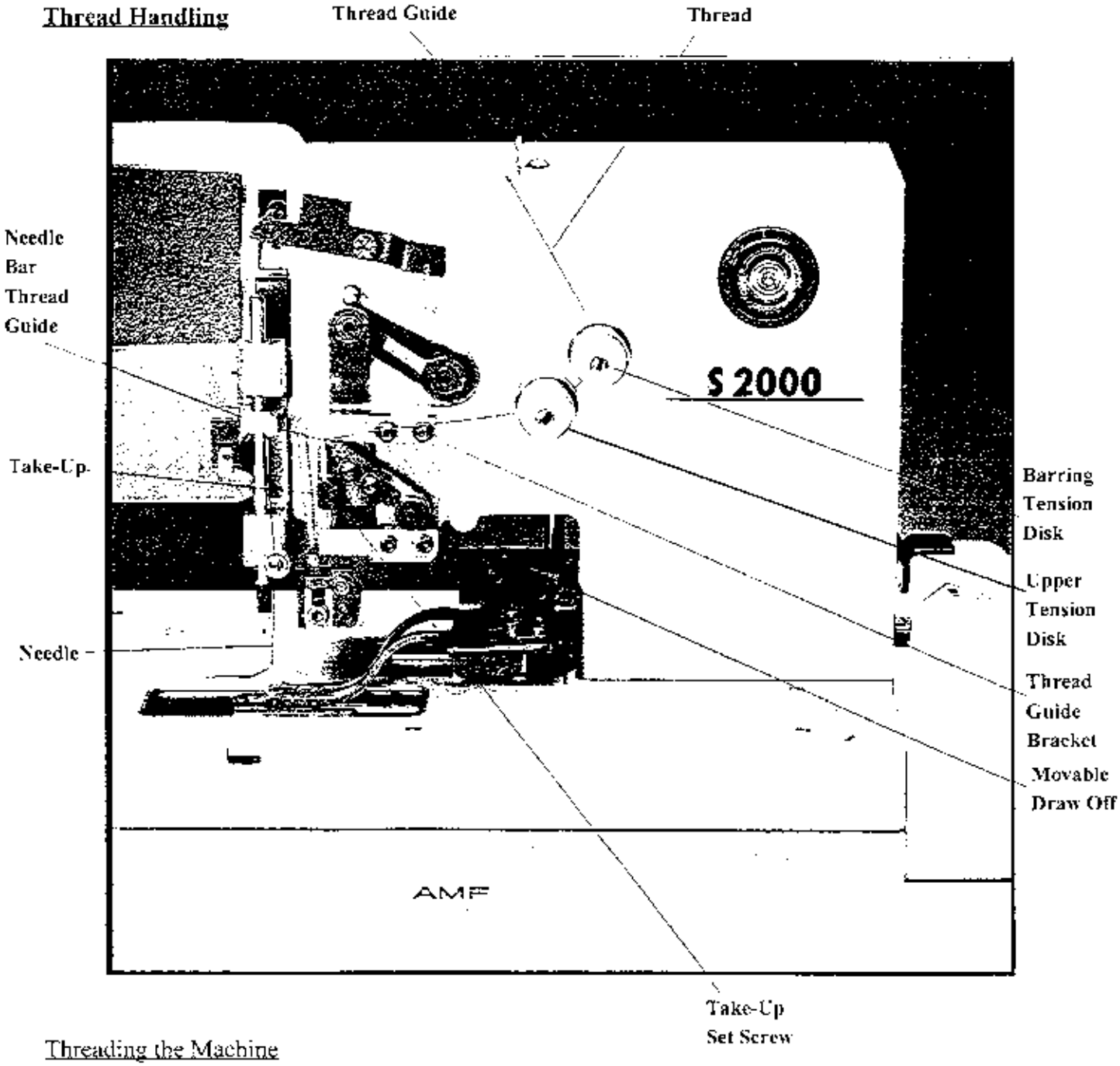


Fig. 1



ADJUSTMENTS

Thread Handling



Threading the Machine

Thread the machine as shown above.

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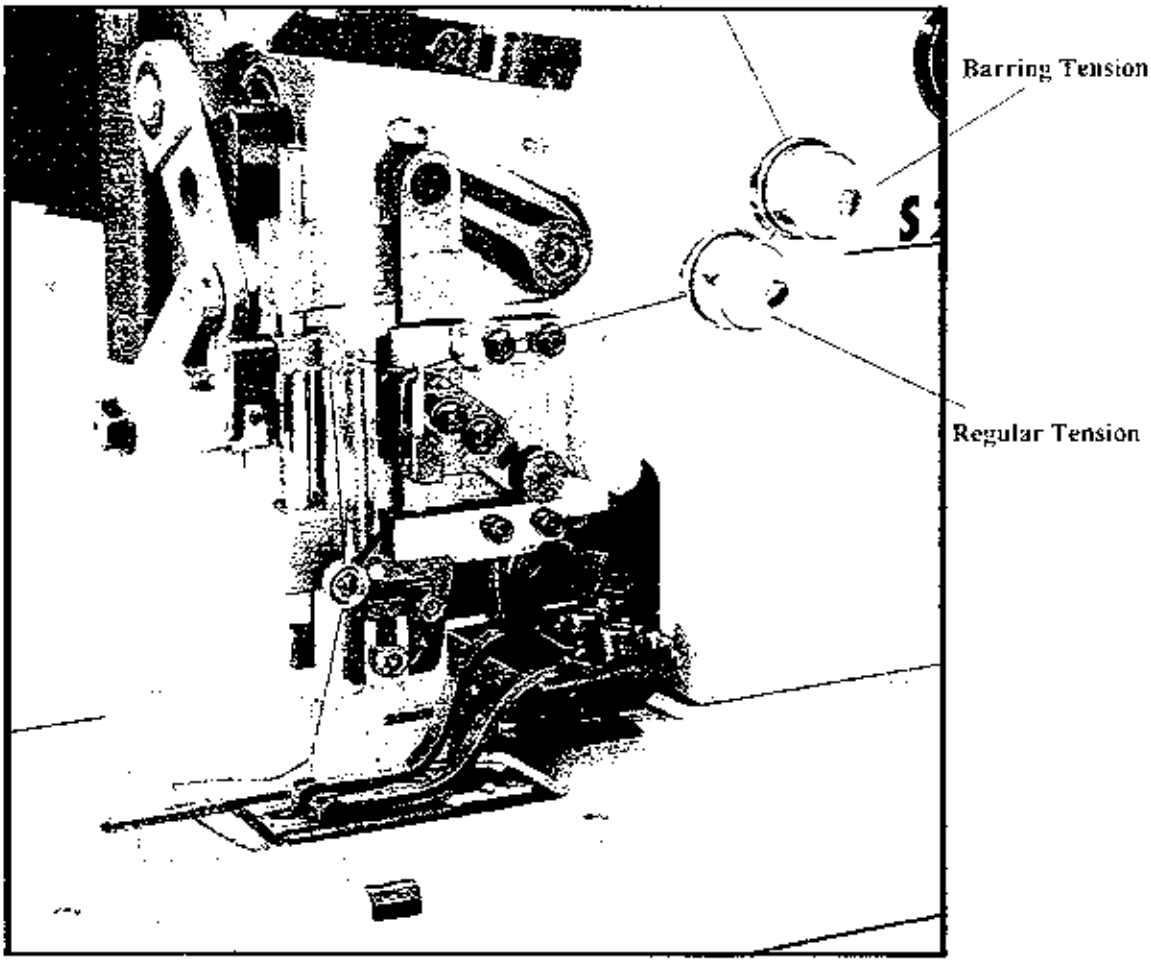
ADJUSTMENTS

Regular Tension

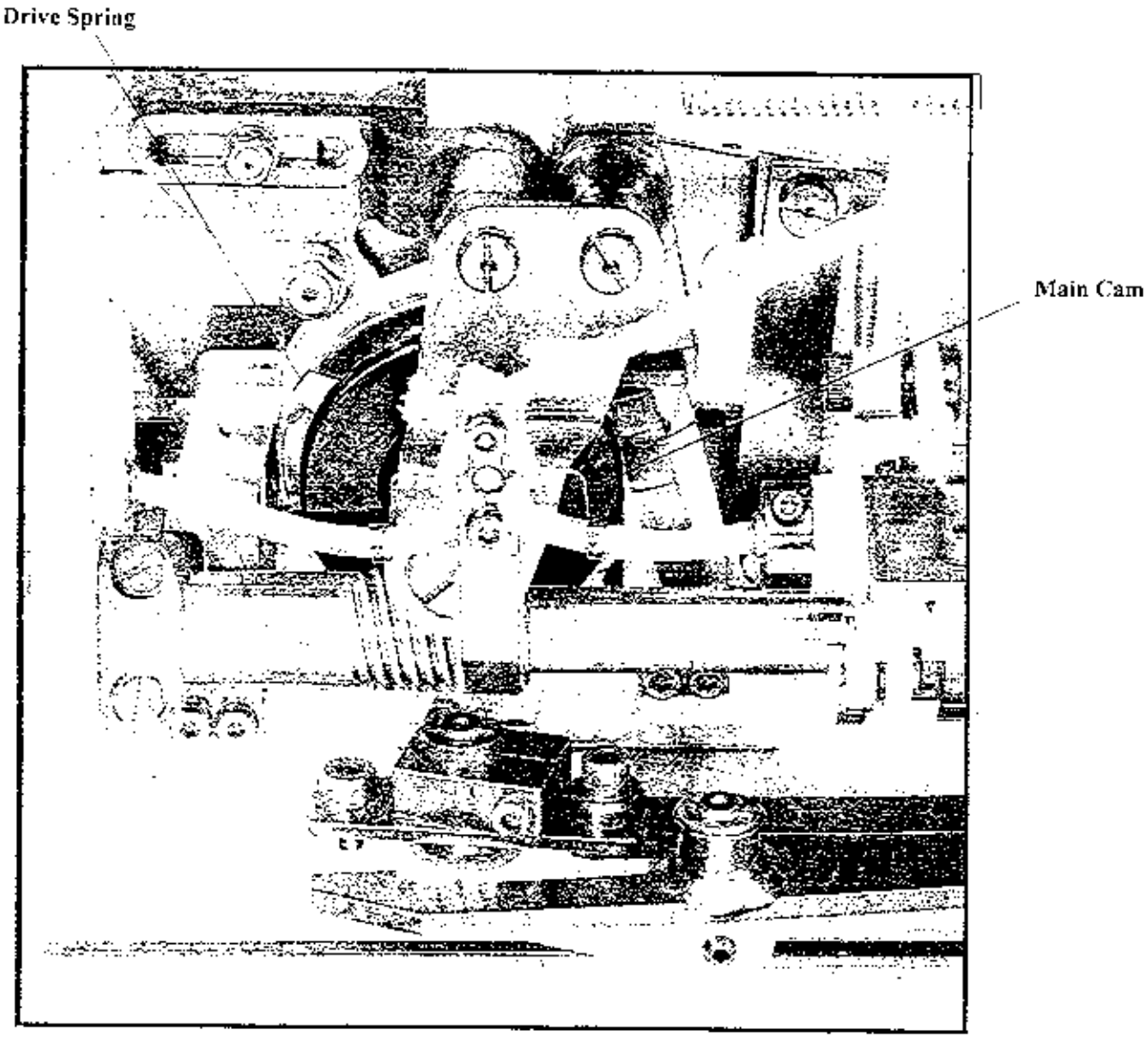
Turn the barring tension clockwise to increase pressure and counterclockwise to decrease pressure on the thread.

Barring Tension

1. *Turn* the regular tension clockwise to increase pressure and counterclockwise to decrease pressure on the thread.



2. *Put* the machine in the first bar position.



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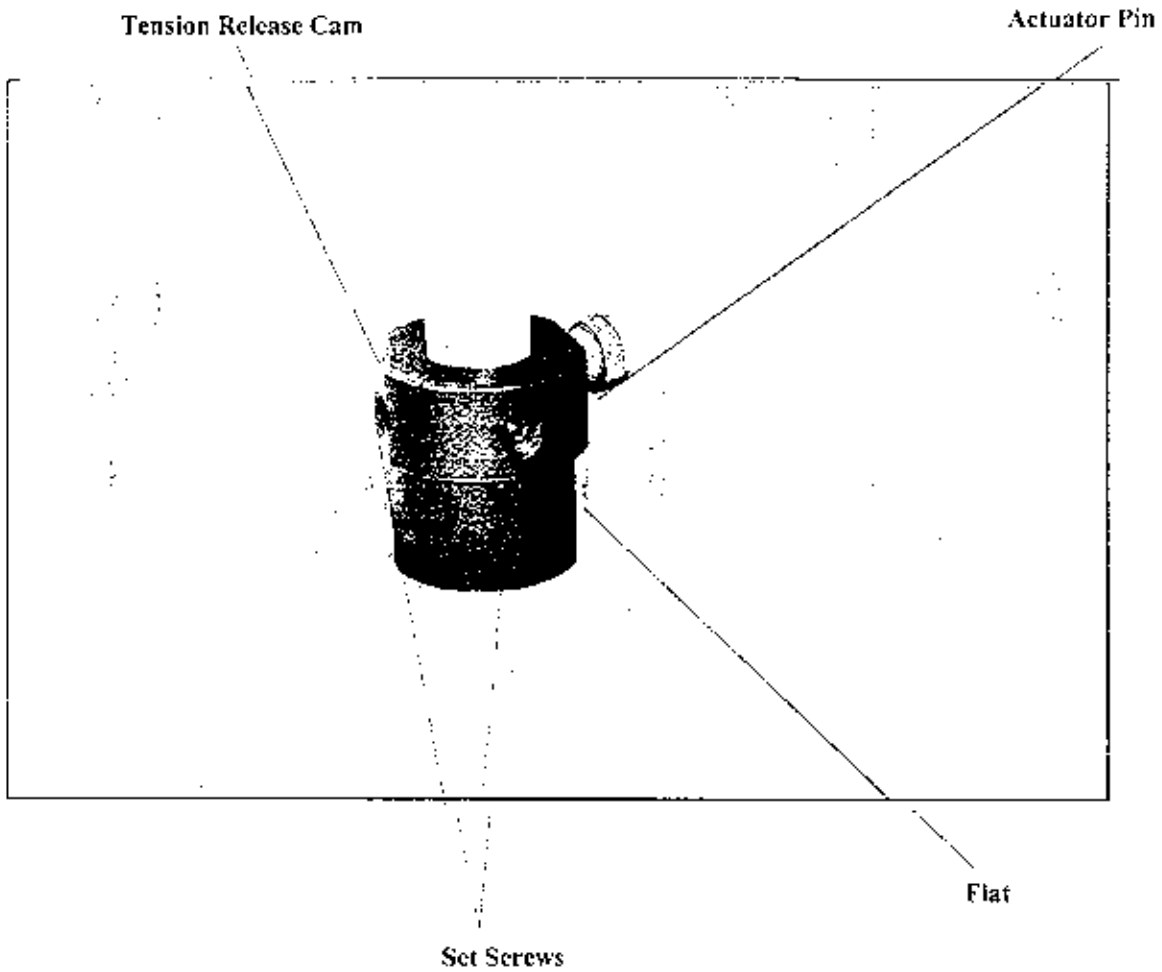
ADJUSTMENTS

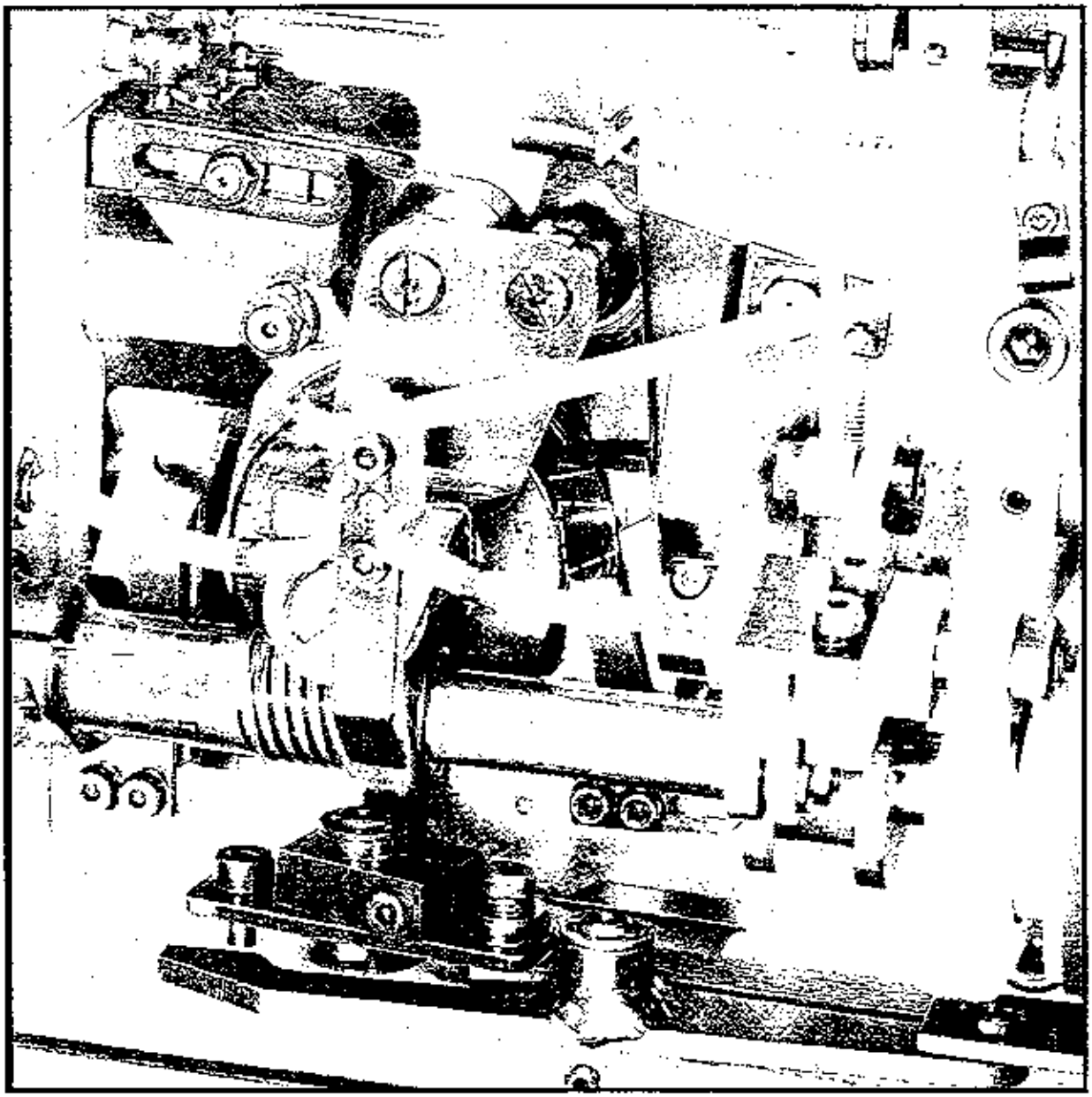
3. To adjust the automatic tension barring release, *loosen* the set screws on the barring tension release cam and *turn* it counterclockwise until the actuator pin meets the flat on the cam and then *turn* slightly further until the tension disk opens.

4. *Tighten* the set screws.



5. *Rotate* the hand wheel and *put* the machine in the second row of stitches, as shown, making sure the barring tension disk is closed.

6. *Ensure* the tension ***opens*** during barring and ***closes*** all other times in the sewing cycle.



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ADJUSTMENTS

Adjusting the Draw Off

1. *Loosen* the screws on the draw off (located on the knife arm) and *move* the draw off to the right for less starting thread and to the left for more starting thread.

2. *Tighten* the screws.

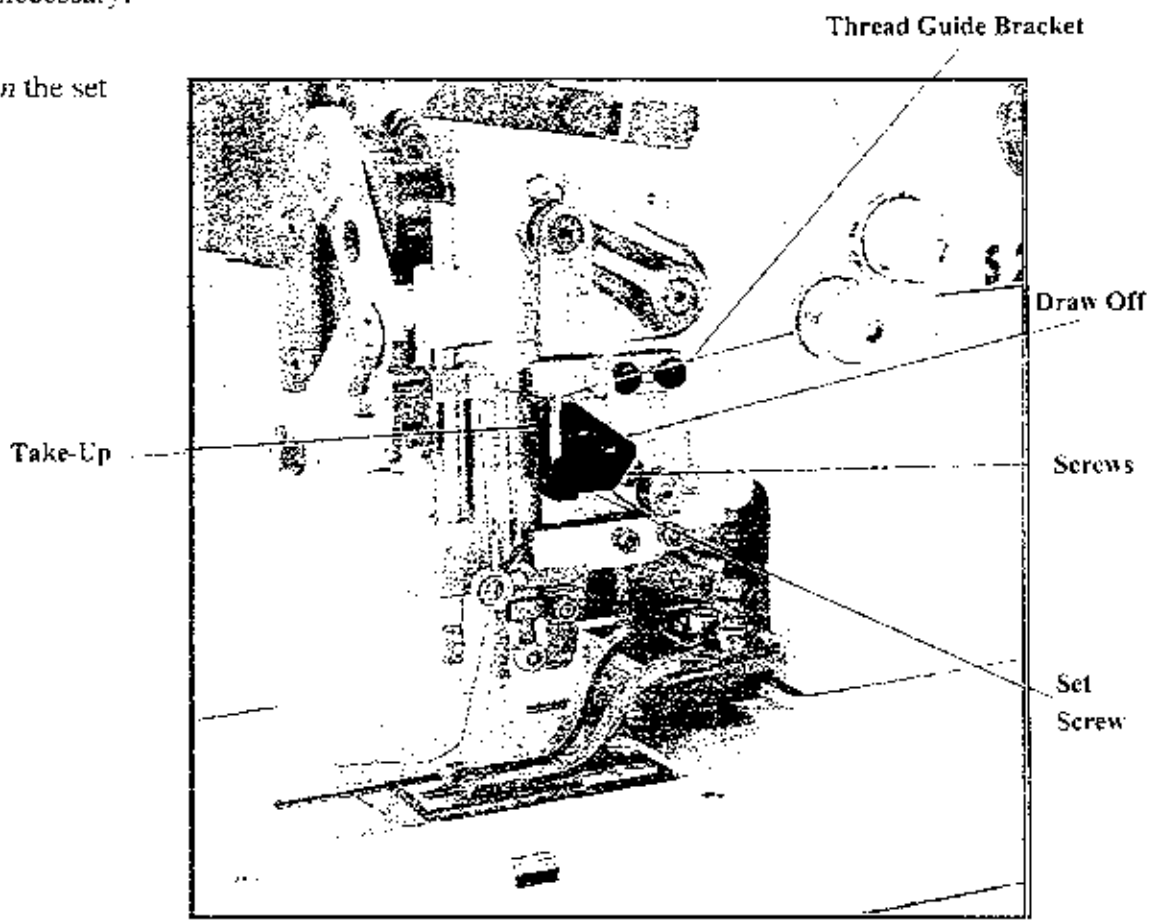
3. To further increase the length of the starting thread, *loosen* the screws on the thread guide bracket and *move* the thread guide bracket to the left, as necessary, to lengthen the starting thread.

4. *Tighten* the screws.

Adjusting the Take Up

1. *Loosen* the take-up set screw and *move* the take-up down to loosen the stitch, or up to tighten the stitch, as necessary.

2. *Tighten* the set screw.

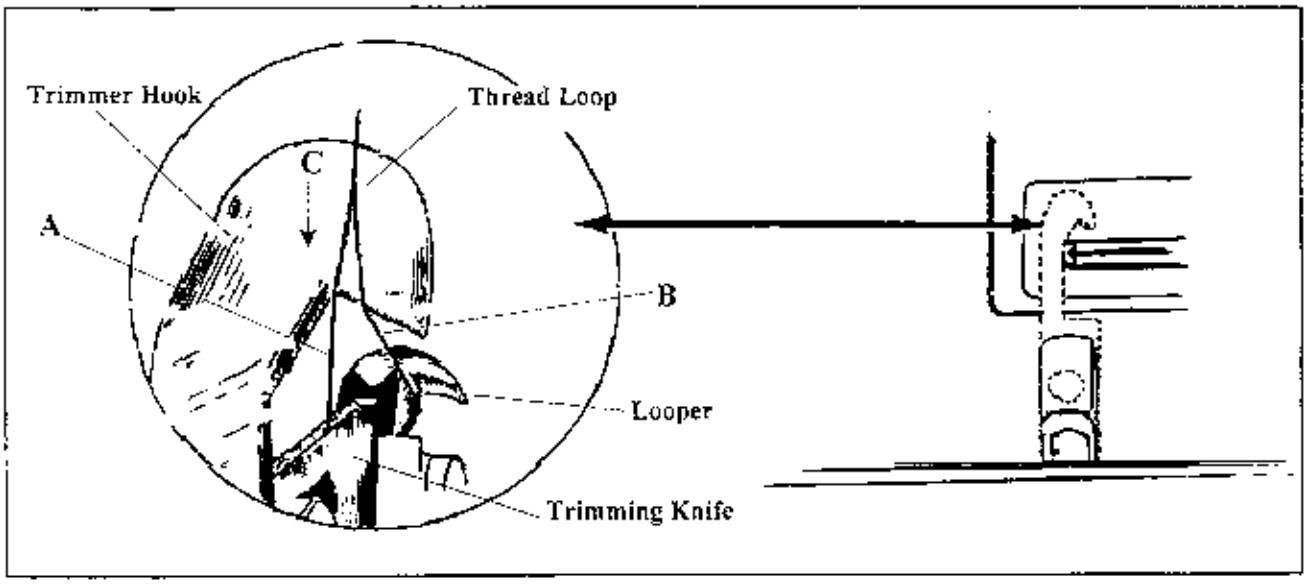


ADJUSTMENTS

Thread Trimming

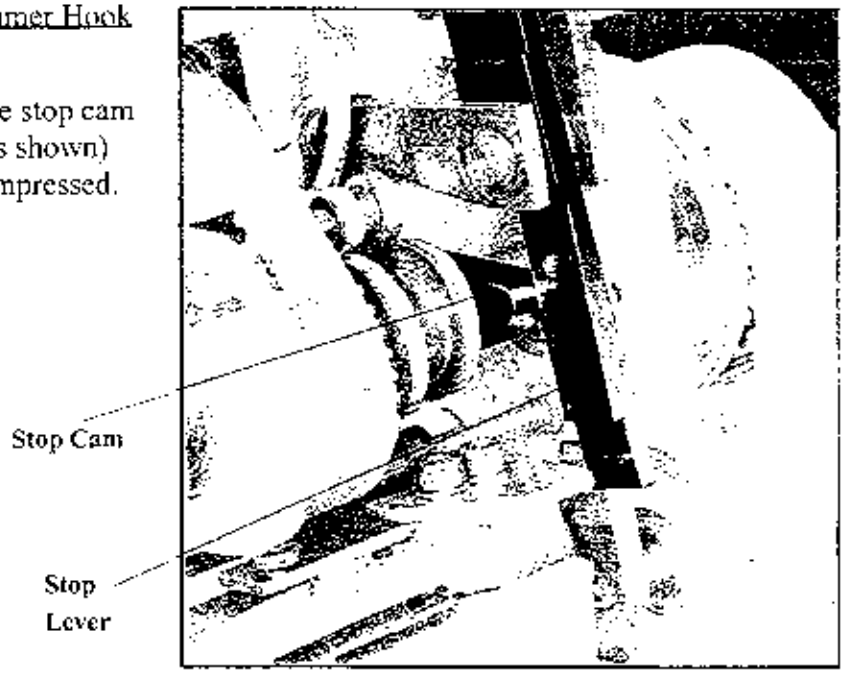
Thread trimming occurs at the completion of the last stitch, as shown below. As the trimmer hook moves in the direction of Arrow **C**, it pulls both legs, **A** and **B**, of the thread loop forward.

When the thread hook approaches the end of the stroke, leg **A** is brought into contact with the trimming knife, cutting the thread.



Timing the Operation of the Trimmer Hook

1. *Rotate* the hand wheel until the stop cam is at 90° before home position (as shown) with the stop bolt spring fully compressed.



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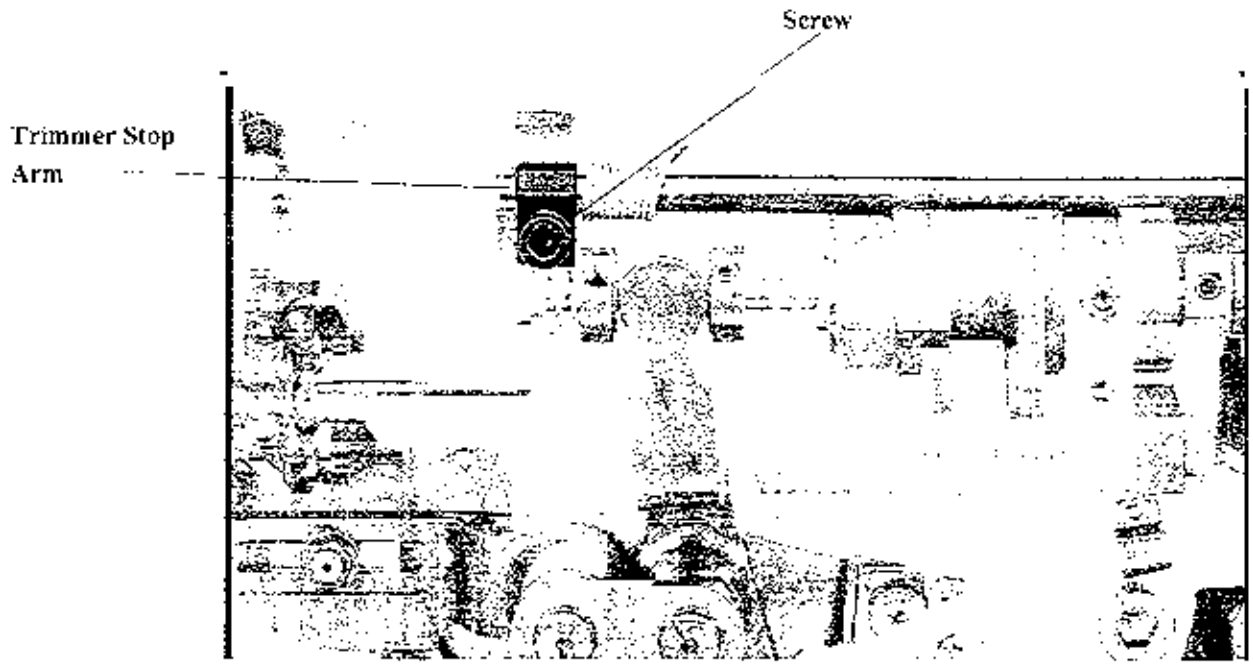
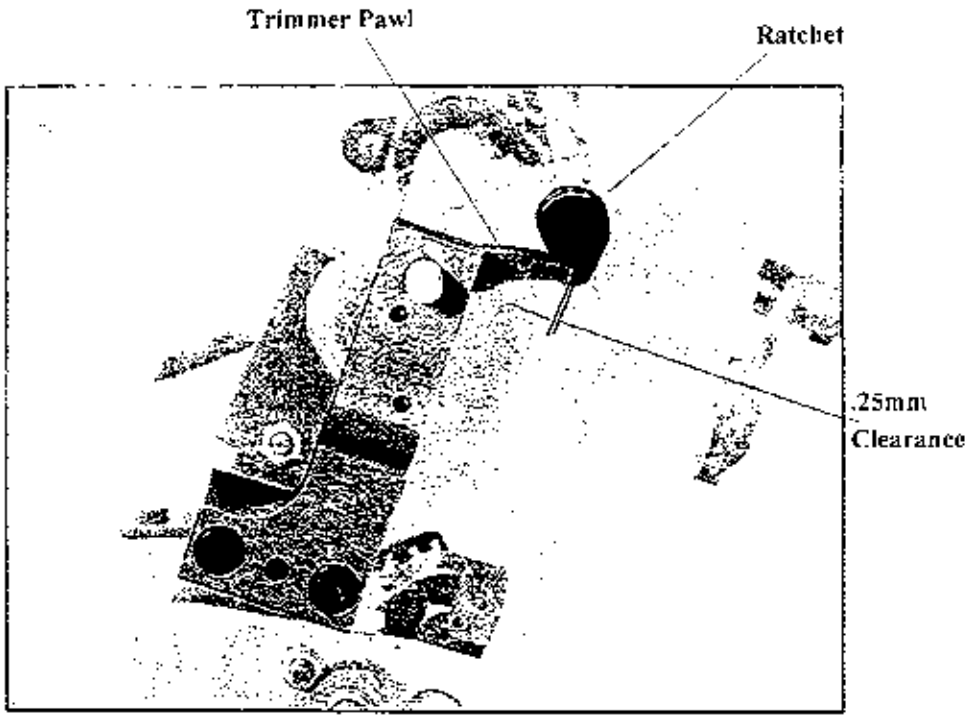
2. *Loosen* the hex screw on the trimmer stop arm and *rotate* the trimmer shaft assembly so that the ratchet and the trimmer pawl are engaged with a 0.25mm clearance.

3. *Re-tighten* the hex screw.



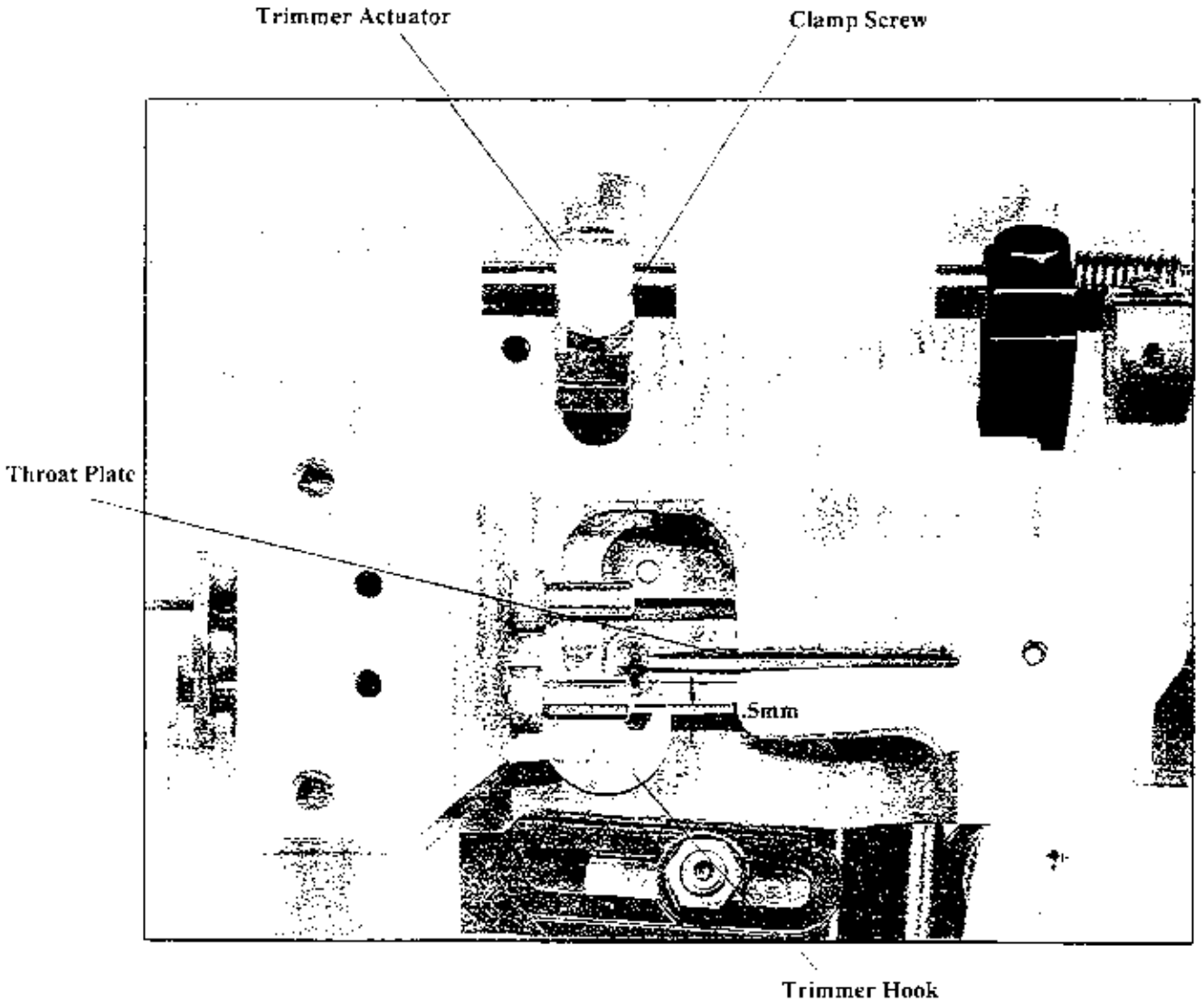


ADJUSTMENTS

Adjusting the Trimmer Actuator

To adjust:

1. *Loosen* the clamping screw and *rotate* the trimmer actuator until the point of the trimmer hook is positioned 1.5mm (1/16") from the edge of the throat plate. as shown.



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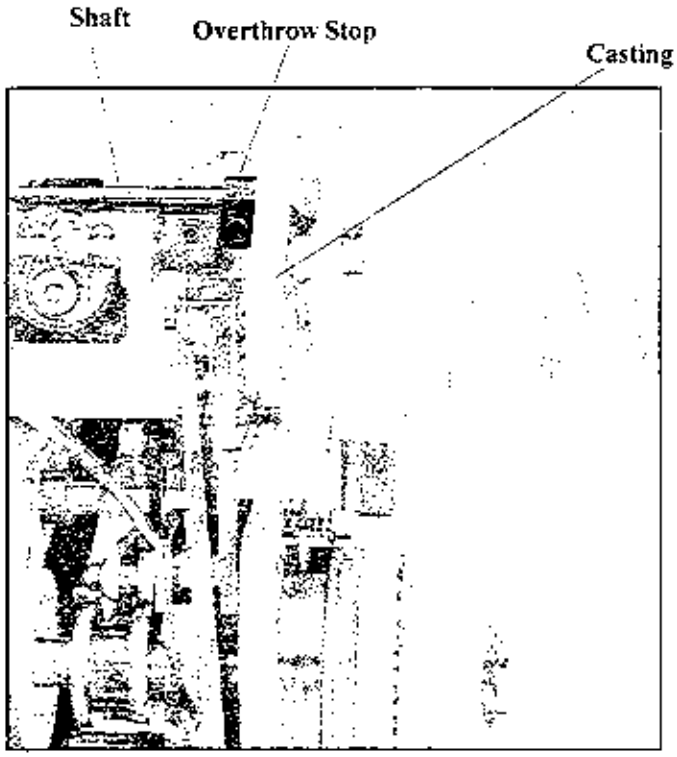
ADJUSTMENTS

Adjusting the Overthrow Stop

1. *Bring* the machine to the home position.

2. *Loosen* the overthrow stop, *push* the trimmer shaft assembly tight against the casting and *position* the stop so there is no side-to-side play in the shaft. Manually *actuate* the trimmer to its extreme position. *Release* slightly, setting the overthrow stop so the trimmer acuator ***does not*** hit the casting.

3. *Tighten* the overthrow stop.

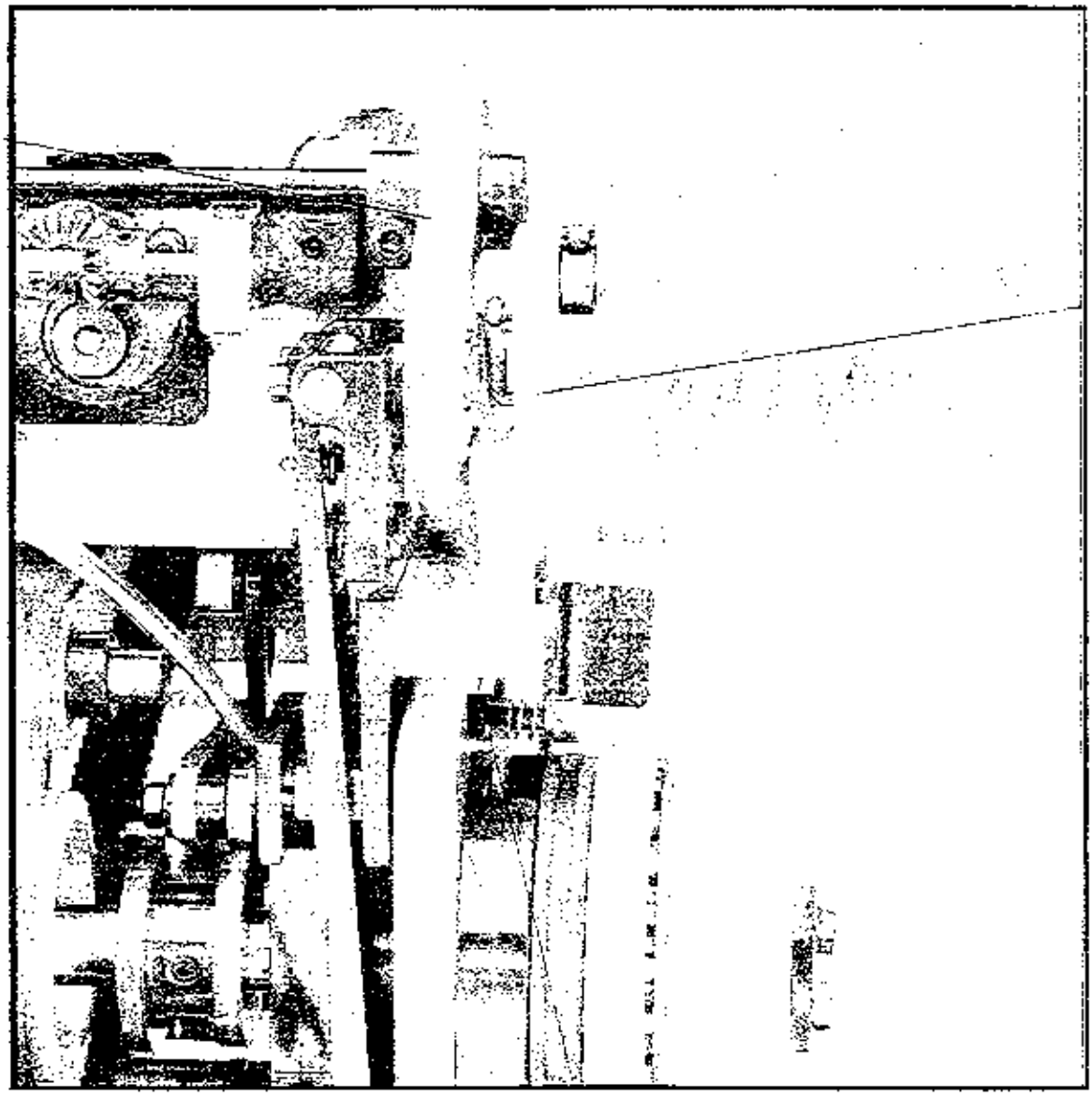


ADJUSTMENTS

Adjusting the Trimming Arm

1. *Loosen* the lock nut and *adjust* the set screw, in or out as necessary, until the trimming arm lightly touches the bedplate casting.

2. *Tighten* the lock nut.



Set Screw & Lock Nut

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ADJUSTMENTS

Adjusting the Cutting Space

To adjust the cutting space of the buttonhole:

1. *Tilt back* the head.

2. *Loosen* the nut on the barring lever and *move* the nut left, for a wider cut, or right, for a narrower cut.

3. *Tighten* the nut.

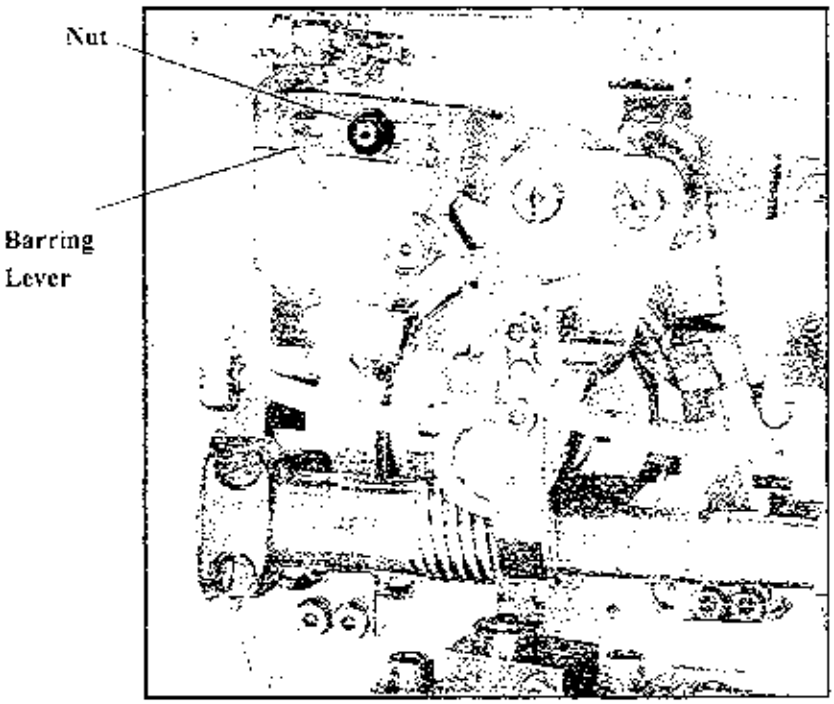

TABLE ADJUSTMENTS

Adjusting the Air Cylinder Mounting

To minimize strain on the connecting links, and prevent the linkage from bottoming out before the piston does, *adjust* the air cylinder so the piston bottoms in the cylinder housing on the retracting stroke. To adjust:

1. *Loosen* the adjusting screws, and *raise* the cylinder 3.2mm (1/8").

2. Manually *push* down on the air cylinder until the base engaging lever moves through its full travel (as required to start the machine).

3. *Tighten* the adjusting screws.

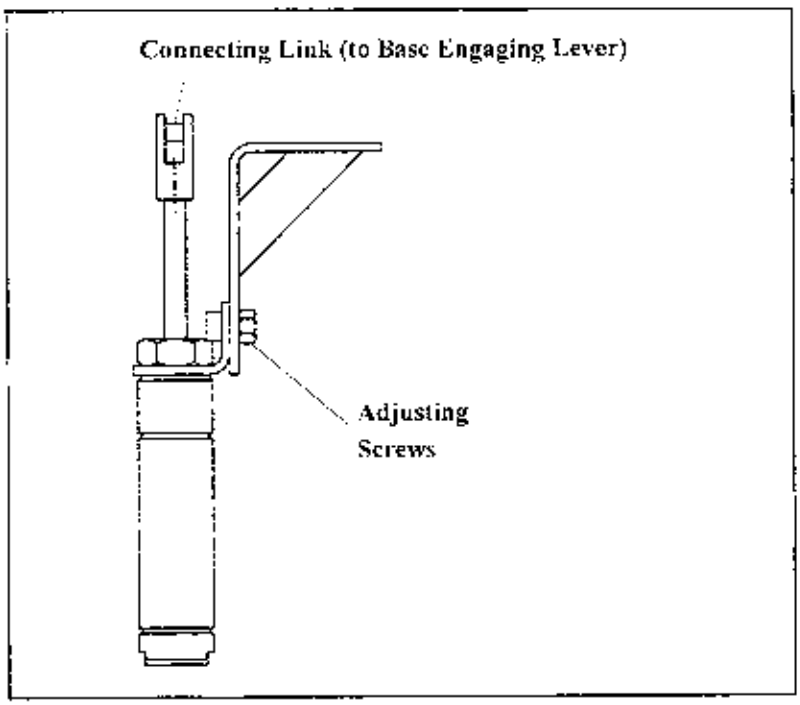

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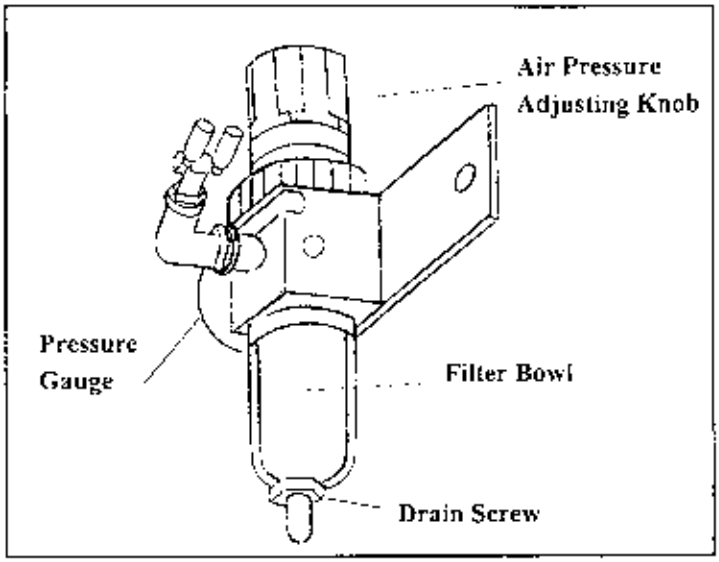
TABLE ADJUSTMENTS

Air Pressure and Filter

Adjust the regulator knob until the gauge indicates the required pressure of 4-5 BAR (70-80 PSI).

Water accumulating in the filter must be drained, as necessary, by loosening the drain screw at the bottom of the filter bowl.



Setting the Time Delay Control Valve

The adjusting screw on the bottom of the time delay valve controls the release time for the base engaging lever so it releases *within* the cycle time of the machine (not more than one second). To adjust:

1. *Turn* the time delay adjusting screw ***clockwise to increase*** time delay.

2. *Turn* the time delay adjusting screw ***counterclockwise to decrease*** time delay.

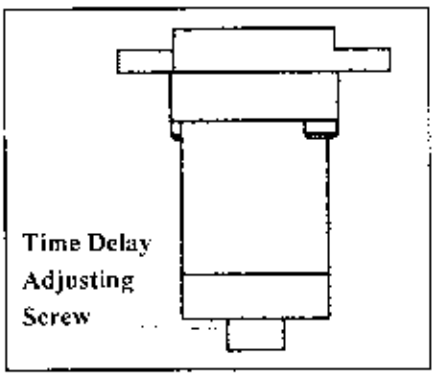


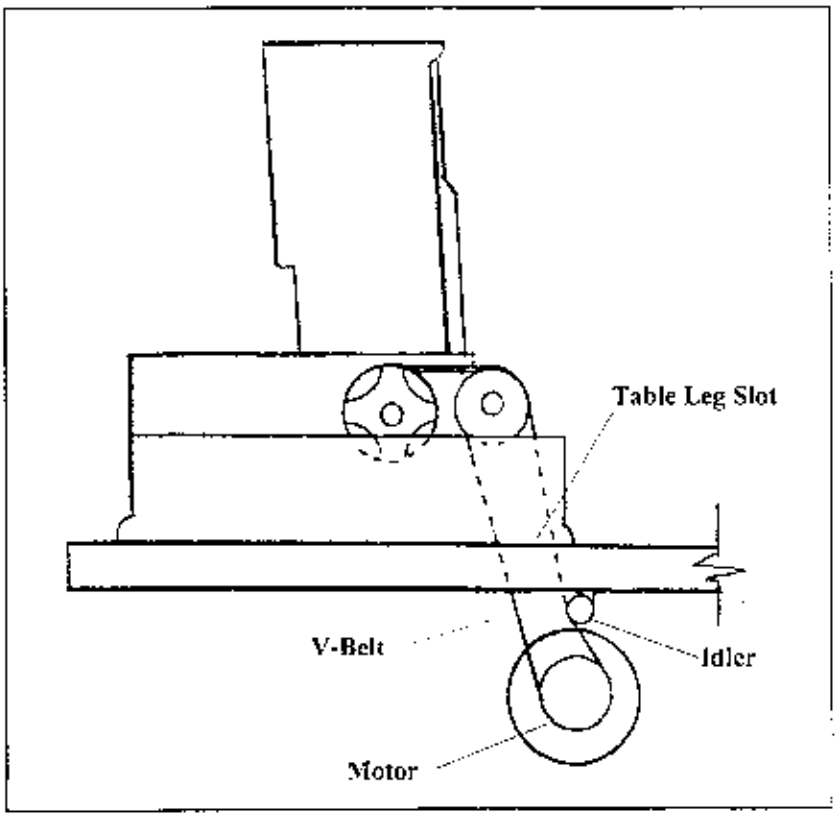
TABLE ADJUSTMENTS

Adjusting the Belt Idler

1. *Install* the V-belt between the motor and the machine.

2. *Adjust* the belt idler to move the right side of the belt away from the table slot edge.

3. *Tension* the V-belt by adjusting the motor position as described in the Table Assembly instructions packed with the Table Kit.



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SEW OFF

The perfect straight buttonhole will have uniform stitching and a crisp, clean cut that is performed once the buttonhole has been sewn. Several things affect the appearance of the finished buttonhole. Please review the following with your specific application in mind.

Stitch density is the number of stitches in a given area. An increased number of stitches can give the buttonhole a higher quality appearance. To adjust: see the *Feed Adjustment*, page 1-44.

Bite width, also called stitch bite, is the width of the stitch from side to side. To adjust: see the *Bite Adjustment*, page 1-42.

Buttonhole length is established by the knife size. To adjust: see *Changing the Knife*, page 1-16.

The ***tightness of the stitch*** is regulated by the two thread tensions. To adjust tension in either of the run stitches, or the end bar, see *Thread Handling*, page 1-61.

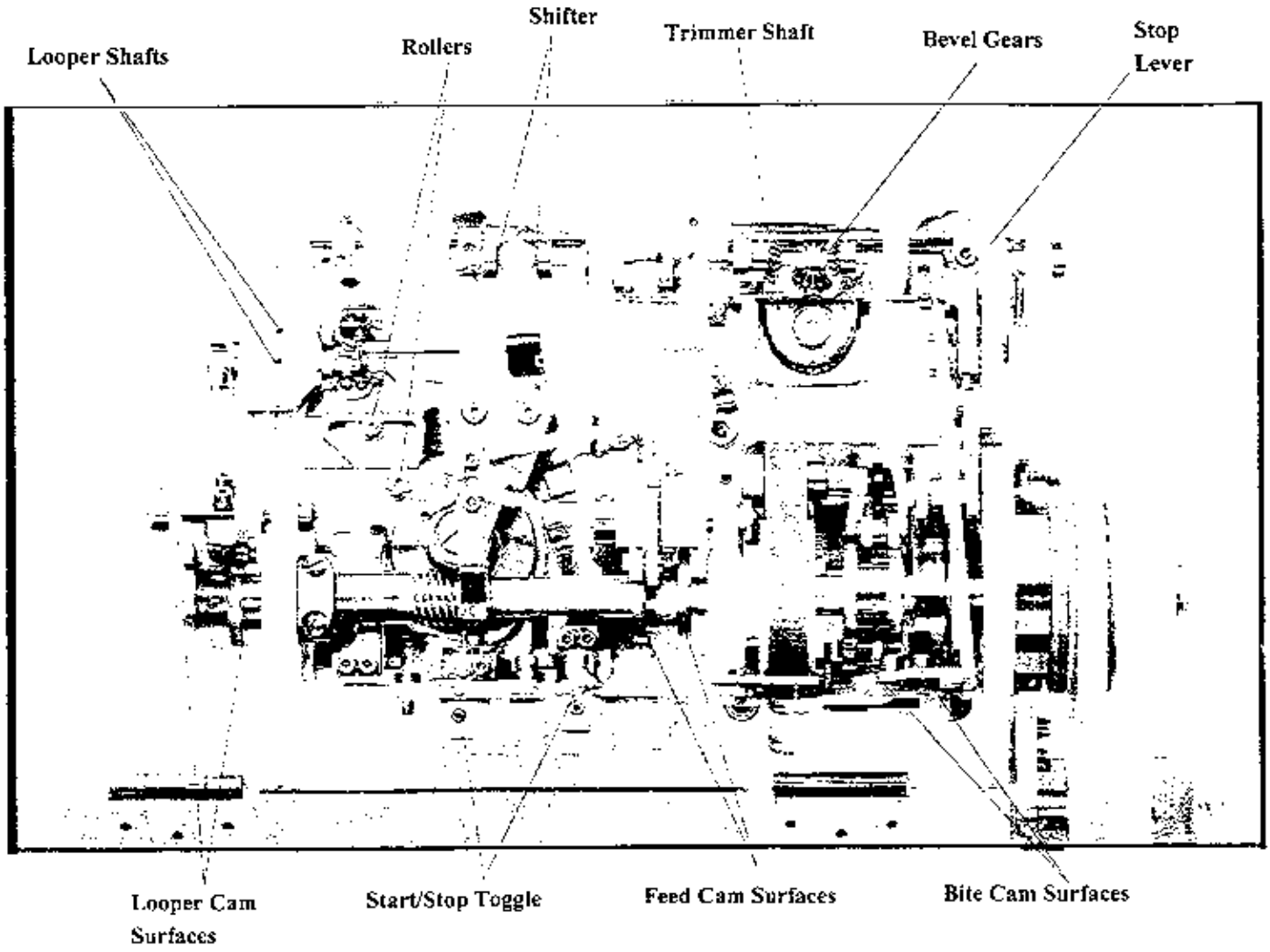
The ***length of the starting thread*** is controlled by the draw off and the thread guide bracket. To adjust: see *Thread Handling*, page 1-61.

The overall ***width of the buttonhole*** is controlled by the *Cutting Space and Bite Adjustments*, pages 1-71 and 1-40.

Cutting space is controlled by the barring lever. To adjust: see *Cutting Space*, page 1-71.

LUBRICATION

Underside of Bedplate



Feed Cam Surfaces	Once a Day	Stop Lever	Once a Day
Shifter	Once a Day	Needle Bar (Felt Cup)	Once a Day
Knife Cam	Twice a Day	Rollers	Once a Day
Start/Stop Toggle	Once a Day	Bevel Gears	Once a Day
Trimmer Shaft	Once a Day		
Looper Cam Surfaces	Twice a Day		
Bite Cam Surfaces	Twice a Day		
Looper Shafts	Once a Day		

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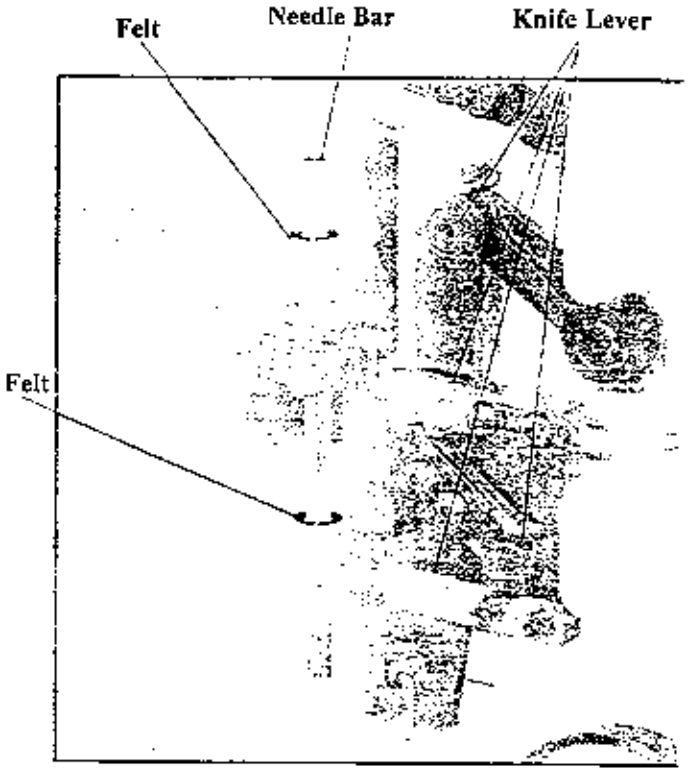
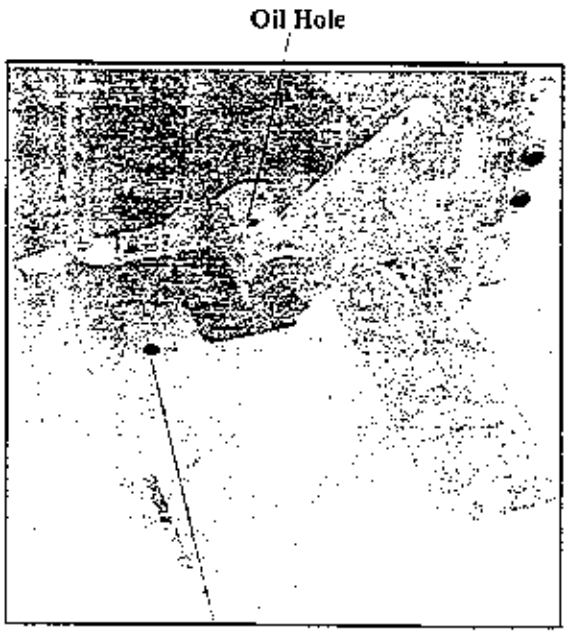
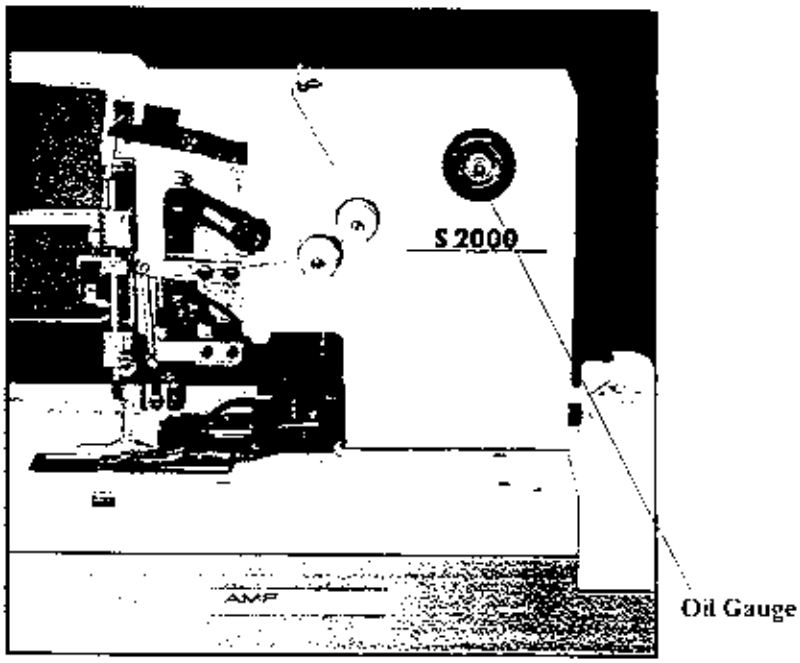
LUBRICATION







ISBH ADJUSTMENTS

Introduction

The S-2000 ISBH (imitation sleeve buttonhole) is identical to the S-2000 straight buttonhole machine, with the following exceptions:

The main cam gear is modified to create a front starter machine with a rounded appearance at one end of the buttonhole and a standard bar at the other end.

The machine barring tension disk has been removed.

The machine knife mechanism has been removed, therefore the buttonhole is not cut.

The clamping assembly provides greater throat depth.

The machine is equipped with a mechanical thread draw-off assembly.

Home Position

The S-2000 ISBH is in the Home position when:

The **stop lever** is resting on the flat side of the **stop cam** (refer to illustration on page 1-17).

The **drive spring** in the main cam assembly is in the detent on the ***right*** shifter arm (refer to illustration on page 1-17).

NOTE: The illustration shows the buttonhole machine with the drive spring in the left shifter arm.

The **left horizontal bevel gear** is engaged with the vertical bevel gear (refer to illustration on page 1-17).

NOTE: The illustration shows the buttonhole machine with the right horizontal bevel gear engaged.

The **clamp plate** is in the ***forward position*** (away from the head casting).

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ISBH ADJUSTMENTS

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ISBH ADJUSTMENTS

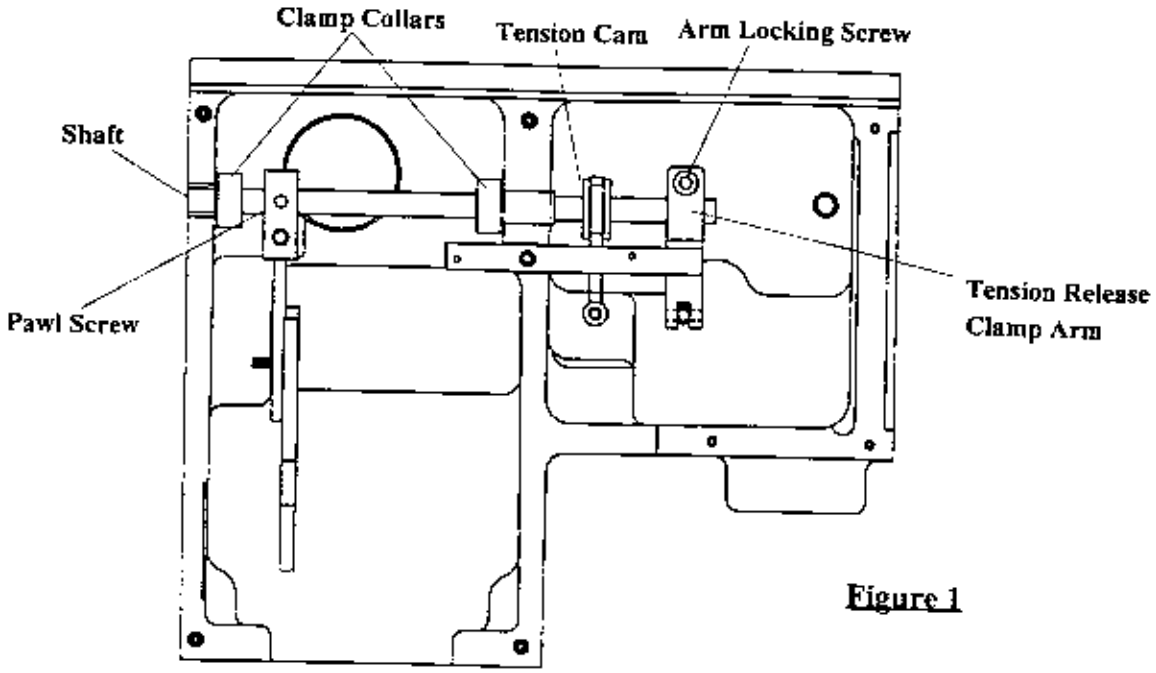

Figure 1

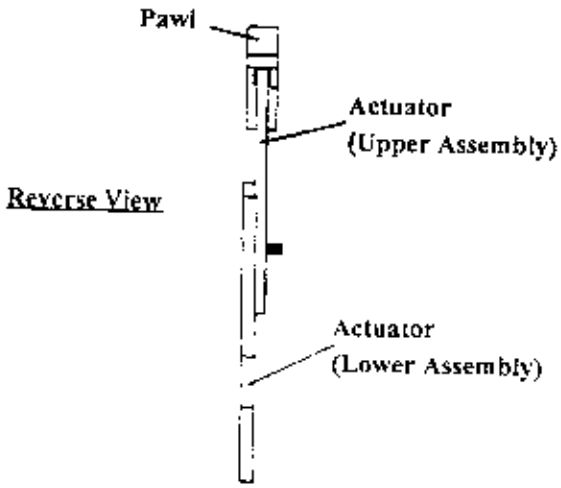

Figure 2

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ISBH ADJUSTMENTS

Draw-off Adjustments

Caution: Before setting the thread draw-off, *ensure* the Automatic Unclamping is set correctly. *Refer* to page 1-59.

Check the thread draw-off actuator shaft, the shaft must rotate freely without end play and the outer end of the shaft is flush with the outside of the head casting (Figure 1).

If incorrect:

1. *Loosen* the clamp collar set screws and the arm locking screw, *adjust* for proper setting, *tighten* the set screws and *push* the arm against the stop screw and tighten the arm locking screw (Figure 1).

Ensure the actuator (upper assembly) is centered in the pawl slot (Figure 2).

If incorrect:

1. *Loosen* the pawl screw. *Move* the pawl along the shaft to center the actuator in the slot (Figures 1 and 2).
2. *Tighten* the locking screw (Figure 1).

ISBH ADJUSTMENTS

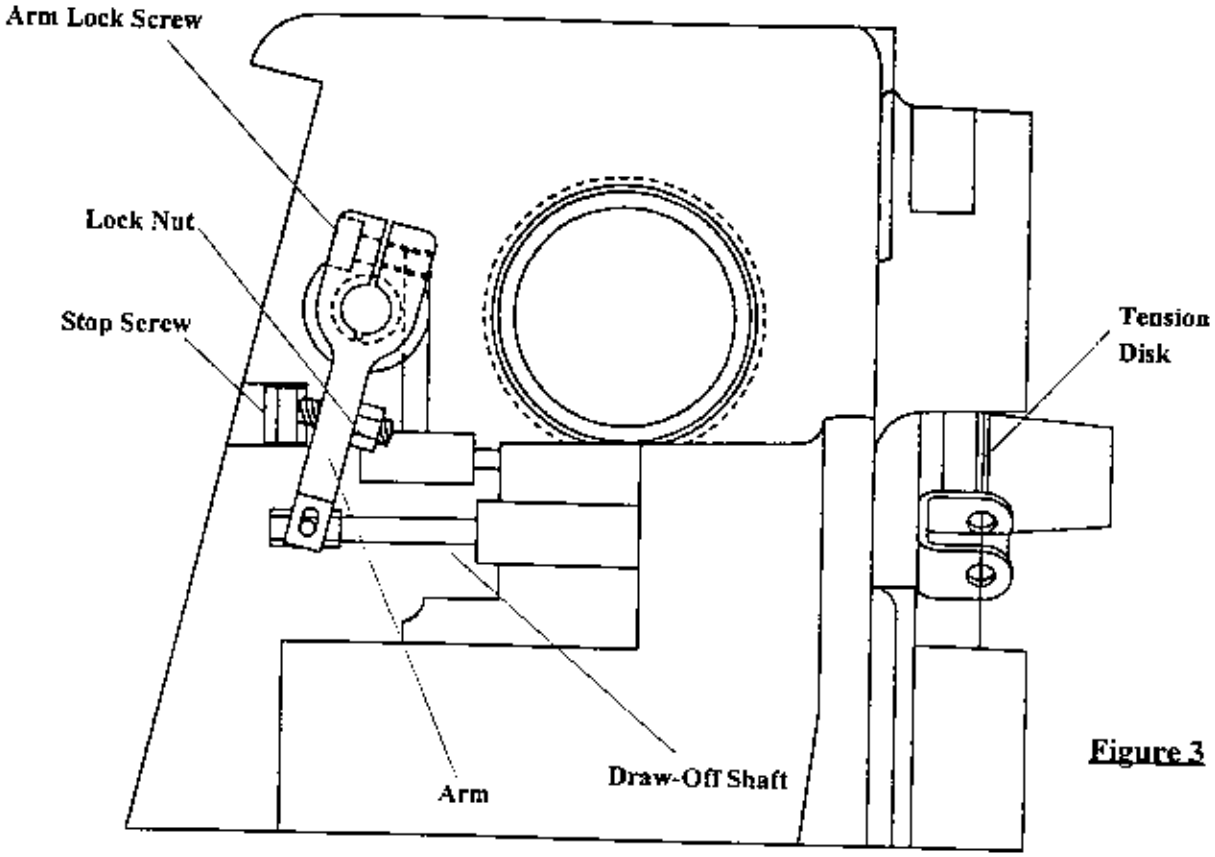

Figure 3

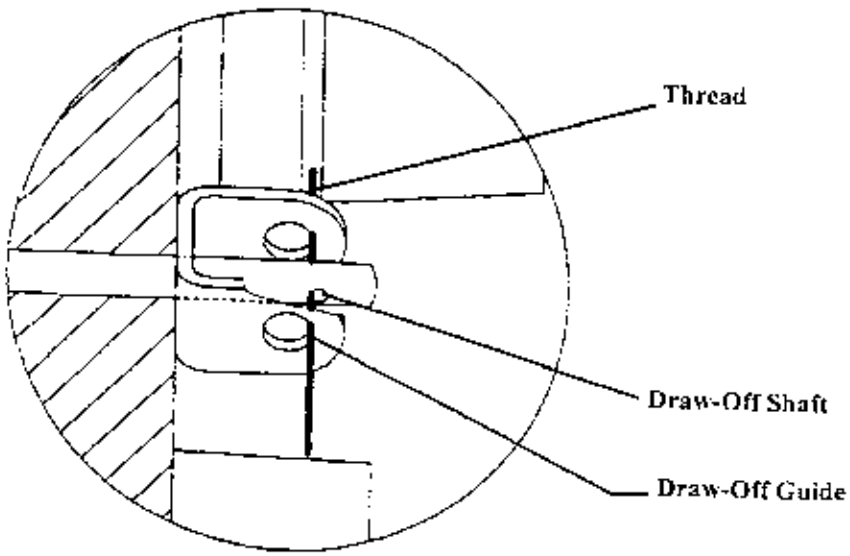

Figure 4

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ISBH ADJUSTMENTS

Draw-Off Shaft Position

Check the thread draw-off shaft position, the slightest outward movement must pull the thread from the tension disc.

If incorrect:

1. *Loosen* the nut on the stop screw (Figure 3).
2. *Adjust* the stop screw until the thread is against the inside of the hole in the thread draw-off shaft and against the outside of the holes in the draw-off guide (Figure 4).

When correct:

The slightest outward movement of the draw-off shaft will pull thread from the tension disk.

ISBH ADJUSTMENTS

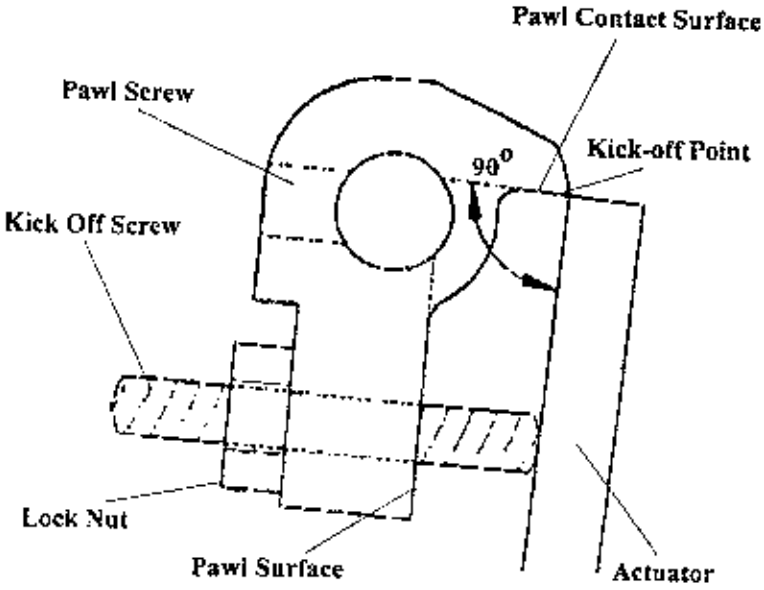

Figure 5

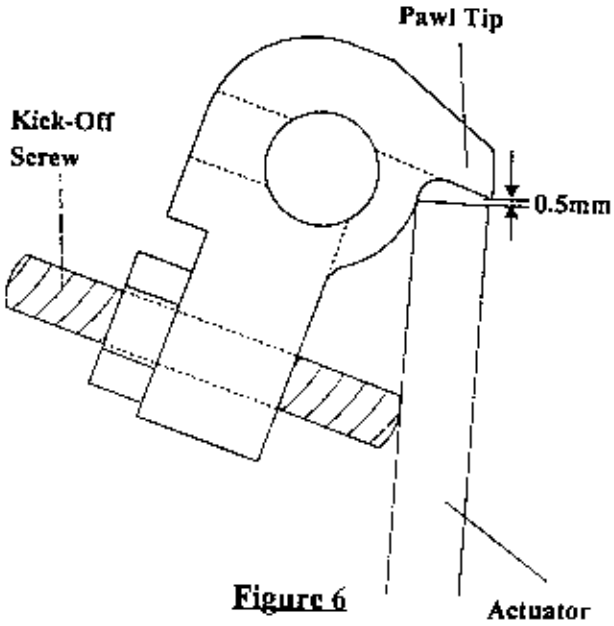

Figure 6

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ISBH ADJUSTMENTS

Correct Relationship Between the Pawl and the Actuator

Ensure the correct pawl to actuator position:

1. With the machine clamped, temporarily *back out* the kick-off screw until the actuator is approximately flush with the tip of the pawl surface (Figure 6).
2. *Loosen* the actuator lock screws and *set* the arm in the lowest position.
3. Manually *push* the arm inward and *hold*, the draw-off shaft will be in the most extended position.
4. *Check* the position of the pawl contact surface, it should be approximately 90° to the actuator (Figure 5).

If incorrect:

5. *Loosen* the arm locking screw, the draw-off shaft is in the most extended position, then *rotate* the pawl and shaft until the contact surface is 90° to the actuator and *tighten* the locking screw (Figure 5).
6. *Release* the arm and *ensure* it is against the stop screw, the draw-off shaft will be in the retracted position.
7. *Adjust* the actuator height until the pawl contact surface and the end of the actuator are approximately .5mm apart (Figure 6), *tighten* the lock screws. *Adjust* the kick-off screw until it contacts the actuator, then *rotate* 1 additional full turn. *Ensure* the clamp feet are closed and *tighten* the lock nut (Figure 6).
8. Manually *clamp* and *unclamp* the machine to ensure no binding.

Caution: If the pawl contact surface is more than 90°, the arm may disengage too soon. If the pawl contact surface is less than 90°, the arm might bind.

Adjusting the Starting Thread Length

The maximum thread length, measured from the needle after draw-off, is 1-3/4" (44mm).
The minimum thread length, measured from the needle after draw-off is 1-3/8" (35mm).

1. *Adjust* the kick-off screw inward approximately nine complete turns for minimum length (Figure 5).

Note: Less than the minimum thread length may cause skipping of the first stitches.

ISBH ADJUSTMENTS

Thread Tension Release

Ensure the tension disks are closed when the machine is in the home position.

If incorrect:

1. *Loosen* the eccentric adjusting screw and *position* the eccentric as shown. (Figure 7).

Note: The flat surface of the eccentric will be against the tension release pin.

When the outer end of the mechanical thread draw-off moves, the tension disks must start to open. (Figure 8)

When correct:

Any movement of the draw-off shaft will release the thread tension.

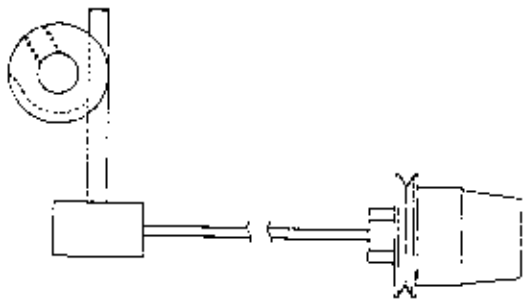

Figure 7

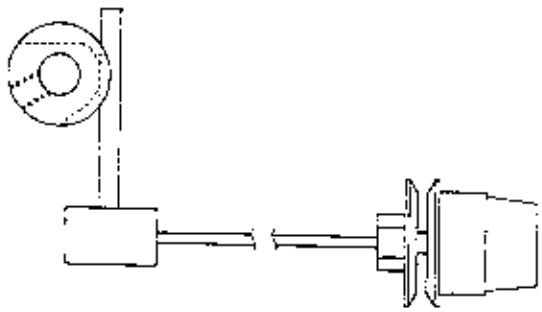

Figure 8

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ISBH ADJUSTMENTS

Thread Tension Release

Ensure the tension opener is centered between the tension discs. *Check* the thread release, any movement of the disc opener must release the thread tension (Figure 10).

If incorrect:

1. *Loosen* the release adjusting nut and *back* the screw fully away from the thread draw-off shaft (Figure 11).
2. To correctly position the disc opener, *loosen* the pivot nut for lateral movement (Figure 12). *Move* the opener in or out to center the opener in the V of the disc. *Tighten* the nut (Figure 10).
3. *Loosen* the mounting and tension mount screws to allow up and down movement of the mounting bracket. *Move* the bracket up and down in the elongation for correct opener height. *Tighten* the screws (Figure 12).
4. With the draw-off shaft retracted, *adjust* the tension release plunger screw until the flat just touches the end of the thread draw-off shaft (Figure 11).

When correct:

Any movement of the draw-off shaft will release the thread tension.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Motor fails to start	No power to the motor	Check electrical plug and wiring
	Incorrect voltage	Check with a voltage meter
	Defective motor starter	Replace starter
Motor started and ran for a short time, then stopped	Thermal setting too low	Check setting of overload heater
	Overload on motor starter set too low	Adjust for a higher value
	Defective motor	Replace motor
	Defective overload	Replace overload
The machine fails to cycle	Incorrect motor rotation	Check power supply and wiring
	Belt has fallen off	Re-install belt
	Insufficient air	Check air pressure and adjust
Uneven feeding	Bind in feed drive system	Remove bind
	Bind in clamp plate	Remove bind
	Bevel drive gears slipping	Tighten gears
	Excessive play in drive system	Re-adjust and/or replace worn parts
Machine fails to stitch	Needle incorrectly installed	Check and re-install needle
	Loopers badly out of adjustment	Check and re-adjust loopers
Machine does not reach home position	Stop motion incorrectly adjusted	Re-adjust stop motion
	Clutch out of adjustment	Re-adjust clutch; replace clutch pads; re-adjust stop/start pin
	Brake out of adjustment	Re-adjust brake
Machine fails to stop properly	Stop motion incorrectly adjusted	Re-adjust stop motion
	Brake out of adjustment	Re-adjust brake
Machine does not grip material, or releases material prematurely	Clamp mechanism incorrectly	Re-adjust clamp mechanism
Machine does not release material	Clamp disengagement incorrectly adjusted	Re-adjust clamp disengagement
Machine does not cut material properly	Knife cam out of adjustment	Re-adjust knife cam
	Damaged knife	Replace knife
	Knife cam damaged	Replace knife cam
	Cam follower on knife cam Damaged or worn	Replace cam follower

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Knife sticking in material	Knife is dull	Replace knife
	Knife not properly aligned with throat plate	Re-adjust knife position
	Knife cam adjustment incorrect	Correct adjustment
Knife cut not centered or Is cutting stitches	Knife installed incorrectly	Re-install knife
	Insufficient cutting space	Check cutting space adjustment
	Insufficient clamping pressure	Check clamping adjustments
	Needle bite not centered over throat place	Center bite
Uneven cutting	Knife not centered	Center knife
	Knife installed incorrectly	Re-install knife
Skipping stitches	Needle incorrectly installed	Re-install the needle
	Bent needle or burr on needle point	Check and replace needle
	Too much clearance between looper and needle	Re-adjust clearance
	Incorrect timing between looper and needle	Re-adjust looper timing
	Loopers are bent or worn	Replace loopers
	Too much clearance between clamp foot and needle entry point	Re-adjust clearance
	Incorrect threading	Re-thread machine
	Incorrect tensions	Re-adjust tension
Skipped stitches at sew Start	Sew start thread length too short	Re-adjust thread draw-off
	Looper timing incorrectly adjusted	Re-adjust looper timing
	Too much clearance between clamp foot and needle entry point	Re-adjust clearance
	Damaged loopers	Replace loopers
Thread breaks	Excessive thread tension	Re-adjust thread tension
	Machine not correctly threaded	Re-thread machine
	Sharp edges on throat plate, looper or needle	Buff off sharp edges
Needle breaks	Incorrect clearance between needle and loopers	Re-adjust clearance
	Incorrect clearance between needle and clamp foot	Re-adjust clearance

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	POSSIBLE SOLUTION
Thread is not trimmed at the end of the cycle	Skipping on last stitch Incorrect trimmer hook adjustment Trim knife dull	Check barring adjustments Re-adjust trimmer hook Replace trim knife
The following pertains to ISBH Models		
Unclamping mechanism binding	Check action between the pawl and the actuator	Refer to automatic unclamping setting
Incorrect draw-off shaft movement at end of cycle	Automatic unclamping incorrect	Correctly set the automatic unclamping
Starting thread too long	Kick-off screw incorrect	Adjust kick-off screw inward for correct setting
Starting thread too short	Kick-off screw incorrect	Adjust kick-off screw outward for correct setting
	Relationship between the pawl and the actuator is incorrect	Correctly set the relationship between the pawl and the actuator
	Check position of the draw-off shaft	Correctly set the draw-off shaft position
	Check unclamping mechanism	Correctly set the unclamping mechanism
	Check the disk opener setting	Correctly set the disk opener position
Short thread tail	Tension not releasing correctly	Correctly position the release adjusting screw
	Relationship between the pawl and the actuator is incorrect	Correctly set the relationship between the pawl and the actuator
	Check position of the draw-off shaft	Correctly set the draw-off shaft position
	Check unclamping mechanism	Correctly set the unclamping mechanism