LEIDEN SPECIAL MACHINERY, B.V.

LSM EYELET BUTTONHOLE MACHINE
MODEL: LSM - K150

INSTRUCTION MANUAL

IMPORTANT

⚠ **TURN OFF THE MOTOR BEFORE MAKING ADJUSTMENTS OR REPAIRS ON THE MACHINE.**

THE MACHINE SHOULD NOT BE OPERATED UNLESS ALL REPAIRS OR ADJUSTMENTS HAVE BEEN MADE, AND THE MACHINE IS IN GOOD WORKING CONDITION.

ALL SAFEGUARDS, COVERS, AND OTHER DEVICES SHOULD NOT BE REMOVED UNLESS REQUIRED FOR CLEANING OR SERVICING. THEY SHOULD BE REINSTALLED ON THE MACHINE IMMEDIATELY AFTER SERVICING OR CLEANING.

Published by LSM, B.V.
The Netherlands
Instruction Manual
Edition 1999-09
Part No 103-201-000

MAINTENANCE AND TROUBLE SHOOTING

WARNING: BELT GUARDS AND OTHER SAFETY DEVICES SHOULD BE RE-INSTALLED ON THE MACHINE AFTER SERVICING

CONTENTS

MACHINE CYCLE

The sewing cycle of the K150, in a Cut After mode, is characterized by three different movements.

1. The clamps drop, the machine head begins to feed back, and the clamps spread.

2. As the machine head moves further back, the sewing mechanism is engaged for stitching.

3. After stitching, the head moves to the forward position, the top thread is trimmed, and the cutting lever cuts the fabric. The clamps then rise automatically for the garment to be removed. The machine head is now in the home position, ready to start cycle again.

STARTING

Depressing the starting lever will allow the left hand drive wheel to engage the contact block on the rear shaft. This starts the cycle for the sewing head to move, resulting in the clamps to drop and spread. The head continues its movement to the back position, whereby the rocking lever swings backward, allowing for the clutch mechanism on the left side to engage.

At the time of the clutch engaging, the drive wheel disengages the driving collar.

STITCHING

Immediately after the drive wheel is disengaged, the clutch is engaged, driving the needle bar, loopers, spreaders, and the feeding mechanism.

At the end of the stitching cycle, the clutch is disengaged.

CUTTING

Immediately after the clutch is disengaged, the drive wheel comes back in operation. Contact is again made with the driving collar on the rear shaft, causing the sewing head to move to the forward position.

During this movement, the top thread is trimmed, and the cutting lever is engaged to cut the fabric. At the finish of this cycle, the clamps raise automatically.

Immediately after the clamps raise, the drive wheel disengages the driving collar on the rear shaft.

The machine head is now in the home position, ready to start another cycle.

USING BY OPERATOR

The following are the step by step procedures for an operator to load a garment and produce a buttonhole, , manually preventing the clamps from raising, installing the needle, stopping the machine in an emergency, and cycling the machine without sewing.

Refer to the drawings on the following page for reference to the machine.

Loading a Garment & Producing a Buttonhole

1. Place the garment under the clamps.
2. The clamps can be lowered by using the clamping/unclamping lever, or they can be allowed to drop automatically prior to the machine sewing.
3. Start the machine sewing by pressing the start sewing lever. If the clamps have not been lowered manually, then they will drop automatically at this point.
4. Wait for the machine to complete the buttonhole. The machine head will come forward, and the clamps will raise automatically.
5. The needle thread is trimmed automatically. The bottom threads have to be trimmed manually before removing the garment.

Manually Preventing Clamps from Raising

The clamps can be prevented from raising automatically by holding down the Clamp Down Button before the machine head comes to the home position. This will allow the operator to maintain garment position in case a repair is necessary.

Installing the Needle

⚠ Turn off the motor.

Referring to P3, Fig 2, install the needle with long groove of the needle facing the same side of the thread tension.

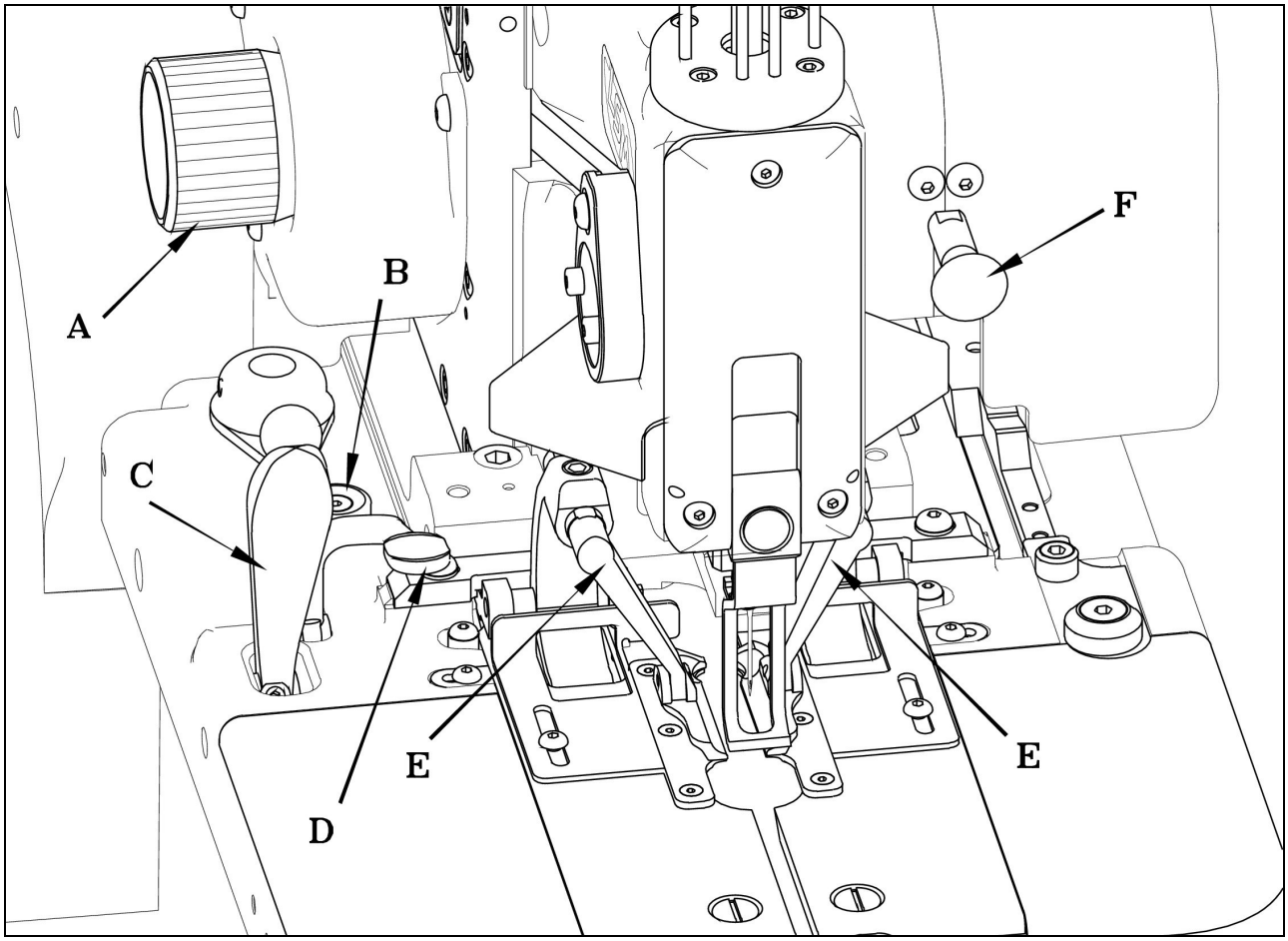


Fig 1

Inserting Needle

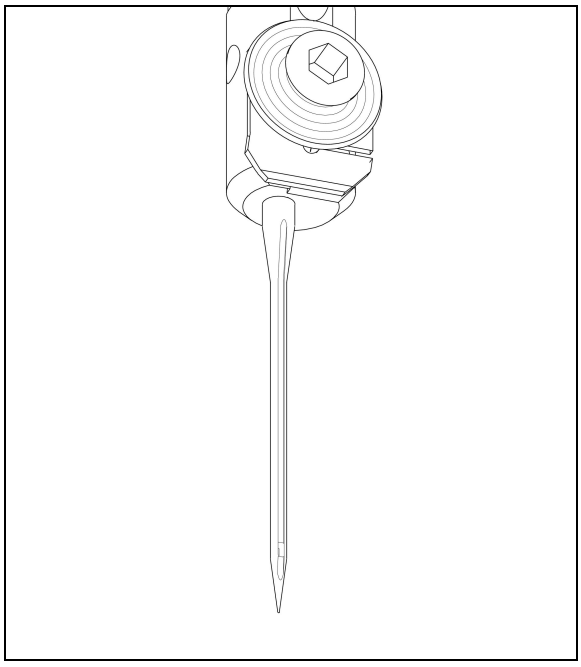


Fig 2

A	**Handwheel**
B	**Clampdown Button**
C	**Clamping / Unclamping Lever**
D	**Start Lever**
E	**Clamp Arm & Foot**
F	**Release Rod**

Emergency Stop

1. The machine can be stopped at any time during the sewing cycle by stepping on the foot pedal **(A)** as shown below. The motor will be turned off and the machine stops instantly.

2. Referring to the previous page, use the hand wheel to turn the needle bar to the top position to bring the needle out of the garment.

3. Raise the clamps by using the clamping/unclamping lever.

4. Remove the garment and trim the threads.

5. Pull out the release rod, and turn the hand wheel until the machine locks up.

6. Turn on the motor. The machine will complete it's cycle and return to the home position.

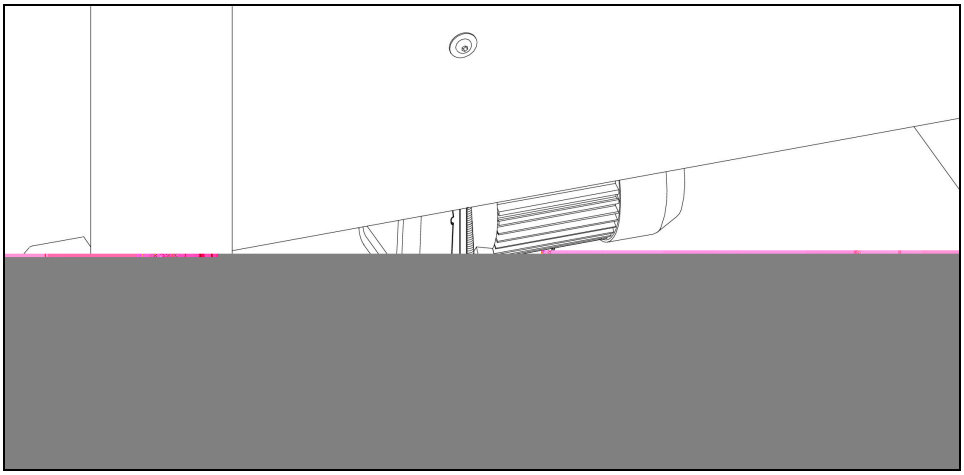


Fig 1

Machine Cycle Without Sewing

The machine has a release rod which allows the machine to travel through a cycle without sewing. Pull out the release rod **(A)** in Fig 2 and then depress the start sewing lever **(B).** When the machine head starts to move, release the rod. The machine will then travel through a complete cycle without sewing. The cutting lever and thread trimmer will operate. The machine can also be stopped at any point in the cycle by using the emergency stop as described above. To complete the cycle, turn on the motor.

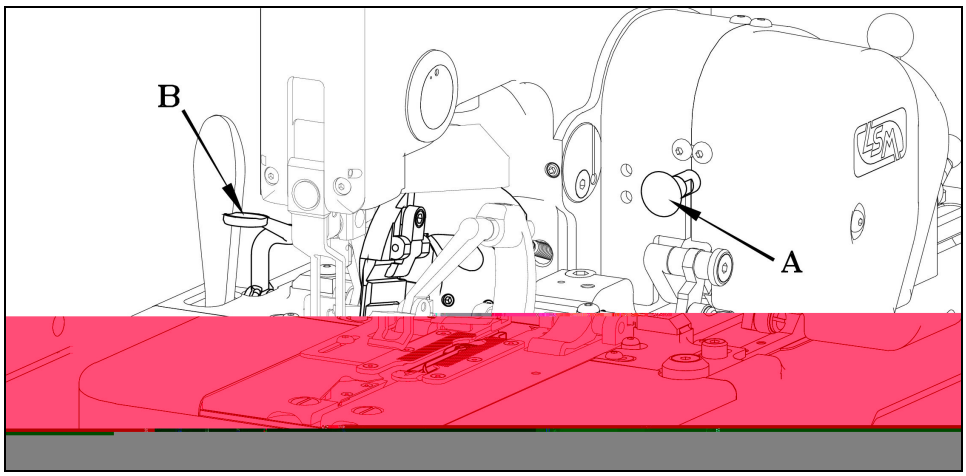


Fig 2

LENGTH OF BUTTONHOLE

The length of the buttonhole is adjustable from a range of 12mm to 32mm. Loosen screw **(A)** in Fig 2 and move the length plate **(B)** to the desired length as shown on the length gauge. Change the cutting block to match the length of the buttonhole.

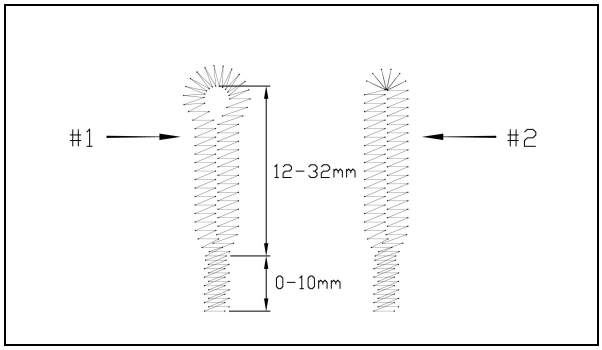


Fig 1

LENGTH OF FLYBAR

The flybar length is adjustable from 0mm to 10mm. Loosen screw **(C)** in Fig 2 and move the screw forward for a longer flybar, and to the rear for a shorter flybar.

The flybar tacks should be equal in length for the starting and finishing of the buttonhole. It is necessary to adjust the length of the finishing flybar to match the length of the beginning flybar. To adjust the length of the finishing flybar, adjust screw **(D)** as shown in Fig 2 . Turning the screw out will lengthen the flybar. Turning the screw in will shorten the flybar. THIS ADJUSTMENT IS VERY IMPORTANT FOR PRODUCING A BUTTONHOLE WITHOUT A FLYBAR. PROPER ADJUSTMENT WILL INSURE THAT THE ENDS OF THE BUTTONHOLE ARE EQUAL.

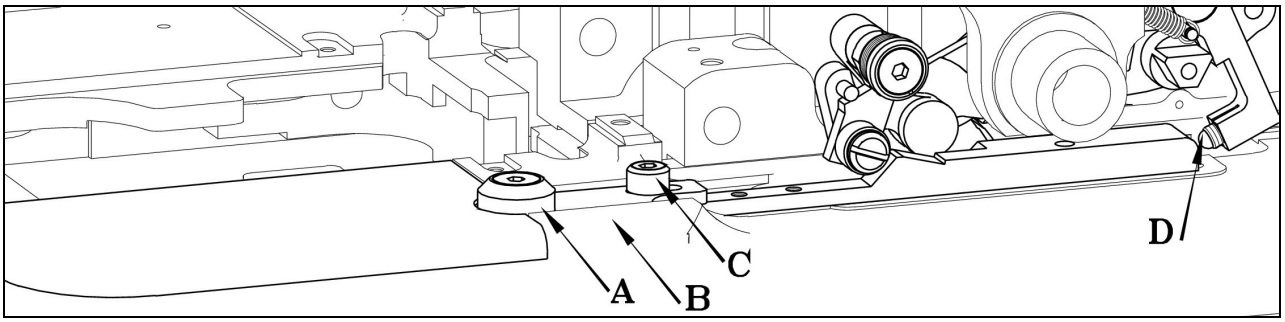


Fig 2

EYE AND NO EYE BUTTONHOLE

As shown in Fig 1, the machine can be adjusted to produce a buttonhole with an eye (picture #1) or a buttonhole with no eye (picture #2).

To change the eye shape, rotate the eye selector in Fig 3 to the appropriate position.

If choosing a no eye buttonhole, also move the shifter lever **(E)** to the forward position to take stitches out of the eye. Change the cutting knife and cutting block for a no eye cut.

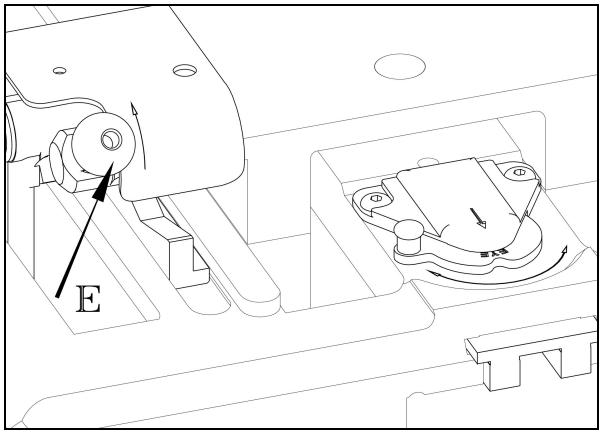


Fig 3

STITCH DENSITY OF BUTTONHOLE

There are two adjustments which affect the number of stitches in the buttonhole:

1. The built in stitch regulator, as shown in Fig 1.
2. The adjustment of the friction brake on the main cam, as shown in Fig 2.

Stitch Regulator

As shown in Fig 1, loosen screw **(A)** and move link **(B)** forward to increase the number of stitches. Move it back to decrease the number of stitches.

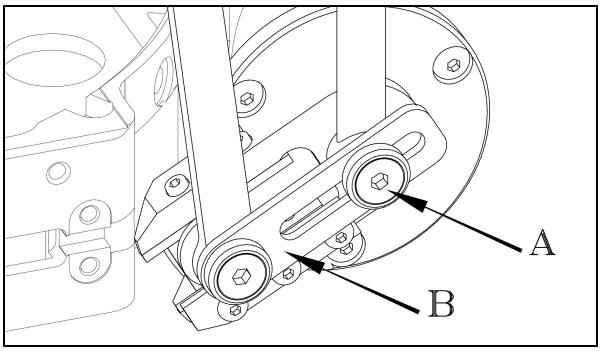


Fig 1

Friction Brake

The brake band around the main cam maintains the cam turning at a constant rate of speed, thus assuring that the stitch density will be the same all around the buttonhole. The friction on the cam also prevents the cam from spinning at the finish of the buttonhole, preventing the possibility of improper stopping

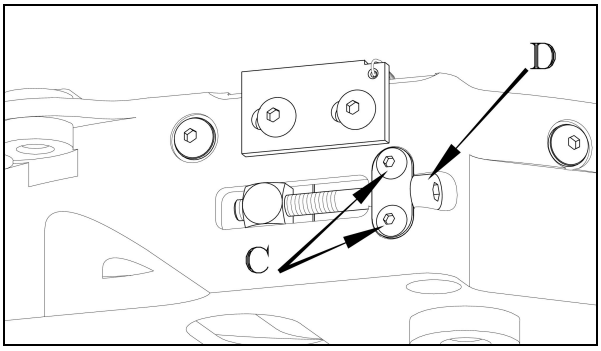


Fig 2

To adjust, ⚠ turn off the motor. Loosen screws **(C).** Then loosen screw **(D)** so that the brake band does not touch the main cam. Using the large left hand wheel, turn the machine though its cycle and at the same time begin to slowly tighten screw **(D)** until there is minimum friction on the main cam. DO NOT OVERTIGHTEN THE BRAKE BAND. Tighten screws **(C)** after adjustment is completed.

Return the machine to Home Position and lock up the needle bar mechanism by the left hand stitch wheel. Turn on the machine. Make a buttonhole and evaluate the stitch density. Re-adjust if necessary.

STITCH DENSITY OF THE EYE

Regular Eye

The number of stitches around the buttonhole can be controlled by the adjustments of the stitch regulator and friction brake on P6.

In addition, the number of stitches around the eye can also be controlled by the stitch wedge **(A).** This adjustment only affects the stitches around the eye. By moving the wedge forward, the roller **(B)** makes contact with the slope of the wedge, which will increase the number of stitches. Less contact with the slope will produce fewer stitches. Loosen screw **(C)** to adjust.

No Eye

When changing the machine to produce a no eye buttonhole (refer to P5), the stitch density of the eye has to be reduced. Move the shifter lever **(D)** forward to reduce the stitches.

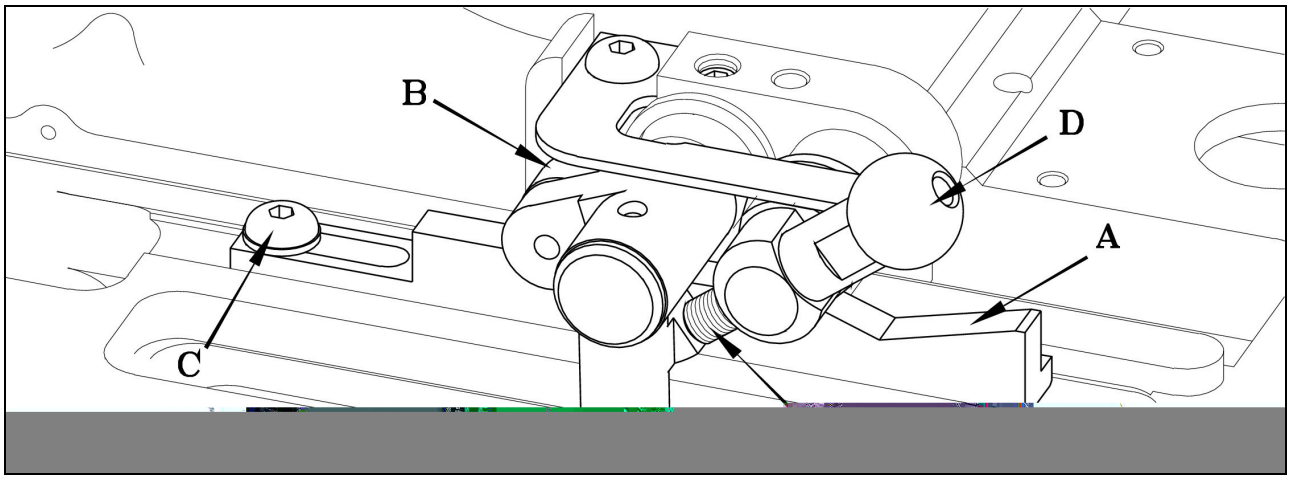


Fig 1

Adjustment of Roller (B)

Roller **(B)** should lightly touch the surface of the stitch wedge as shown in Fig 1. Adjust the screw **(E)** to raise or lower the height of the roller.

CHANGING MODE OF CUT BEFORE AND CUT AFTER

The K150 has a unique system for allowing the operator to not only change the machine to a cut after or cut before mode, but also allows the stitch bite and cutting space to be changed with one simple adjustment. Further details are explained on Pages 19-20.

The adjustment in Fig 1 can be set for either the cut after or cut before mode. This changes the stitch bite and cutting space. The cut after mode sets the machine for the standard stitch bite of 2.4mm and cutting space of 0.3mm.

The cut before mode sets the machine for a stitch bite of 3.2mm and 0mm cutting space.

Change to Cut Before Mode

1. It is necessary to cycle the machine to move the head to the back position, and apply the emergency stop. Refer to P4 for instructions.

2. Refer to Fig 1. Loosen screw **(A)** and move forward to the CB position. Tighten the screw.

3. Refer to Fig 2. Change the CB/CA selector **(B)** to the CB position.

4. Turn on the motor, and the machine will return to the home position.

<< Home position in the cut before mode occurs immediately after the clamps have raised. The machine head does not move any futher >>

Change to Cut After Mode

1. It is necessary to cycle the machine to move the head to the back position, and apply the emergency stop. Refer to P4 for instructions

2. Refer to Fig 3. Loosen screw **(A)** and move back to the CA position. Tighten the screw.

3. Refer to Fig 4. Change the CB/CA selector **(B)** to the CA position.

4. Turn on the motor, and the machine will return to the home position

<< Home position in the cut after mode occurs after the clamps have raised and the machine head moves forward by approximately 2mm and stops >>

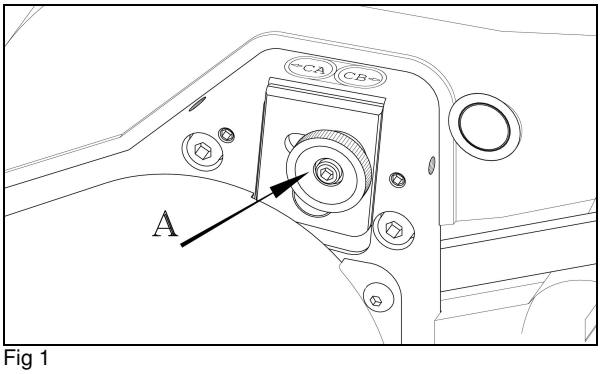


Fig 1

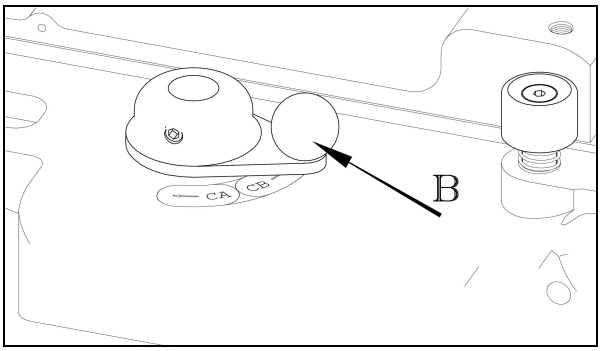


Fig 2

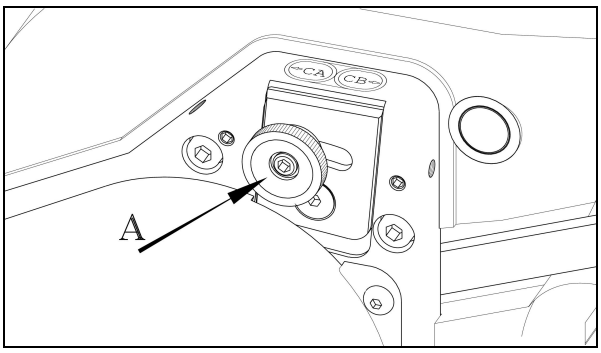


Fig 3

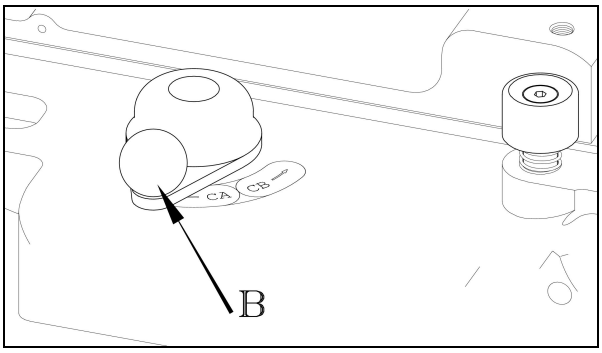


Fig 4

The adjustments of the start and stop motion should be done in a checking sequence since a few of the adjustments have an affect on the adjustments following. By using the sequence below, the adjustments will be done in the correct order. All adjustments are made with the motor turned off.

SEQUENCE OF START AND STOP MOTION ADJUSTMENTS

Checking Sequence	Adjustment	Page	Ref
1	Set Machine to Cut After Mode	8	-------
2	Turn machine to home position	9	-------
3	Move the stop bolt to prepare for adjustment 4	9	Ref 3
4	Adjust clearance of roller on length gauge	9	Ref 4
5	Move stop bolt back to original position	9	Ref 5
6	Adjust stop plate	10	Ref 6
7	Adjust driving collar & driven collar just as machine starts sewing	10	Ref 7
8	Adjust roller on stop wheel during the sewing cycle	10	Ref 8
9	Adjust driving collar & driven collar - Cut After mode	11	Ref 9
10	Adjust driving collar & driven collar - Cut Before mode	11	Ref 10
11	Adjustment of eccentric for CB/CA slide	11	Ref 11
12	Adjustment of the pin in the CB/CA slide	12	Ref 12
13	Release of stop bolt at the finish of sewing	12	Ref 13
14	Brake adjustment on stop wheel	13	Ref 14
15	Adjustment of safety stop	13	Ref 15

⚠ Remove V-Belt & Head-Belt before adjustment,.

1. Set the machine to cut after mode. See P8.
   ⚠ Turn off the motor.

2. Turn the machine head to the home position. See P8.

3. Loosen screws **(A)** in Fig 1. Move the stop bolt to the rear by 10mm. Lightly tighten screws **(A).** (*This is not an adjustment. This is in preparation for item 4)*

4. Adjust Clearance of Roller

Check the clearance between the bottom of roller **(G)** and the top of the length gauge **(H)** as in Fig 2. The roller should lightly touch, but still be able to turn freely.

To adjust, loosen nut **(L)** in Fig 4 on P10. Turn screw **(K)** down for more clearance, or up for less clearance. After tightening nut, check the clearance again between the roller and the length gauge.

5. Re-set Stop Bolt

Loosen screws **(A)** and pull the stop bolt firmly against the stop pulley. Lock up the machine. Continue holding the stop bolt firmly against the stop pulley and tighten screws **(A).** There should be no side movement in the stop bolt.

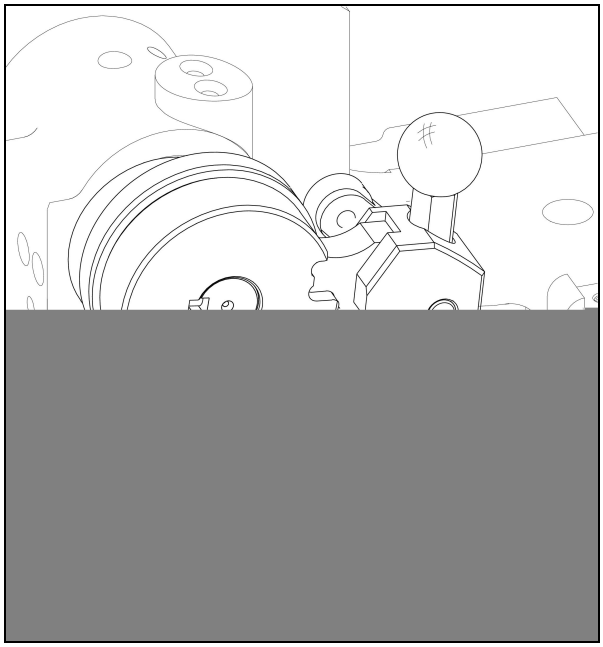


Fig 1

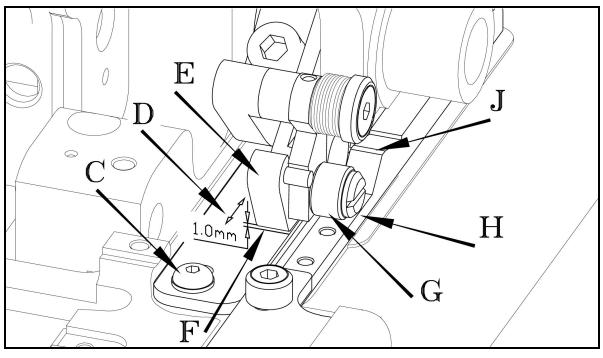


Fig 2

6. Adjust Stop Plate

Refer to P9, Fig 2. To adjust stop plate **(D),** loosen screw **(C)** and push the plate all the way back. Then pull it slightly forward and tighten screw **(C).** Check the clearance between lever **(E)** and the stop plate at point **(F).** It should be 1.0mm. Move the plate forward for more clearance and back for less clearance.

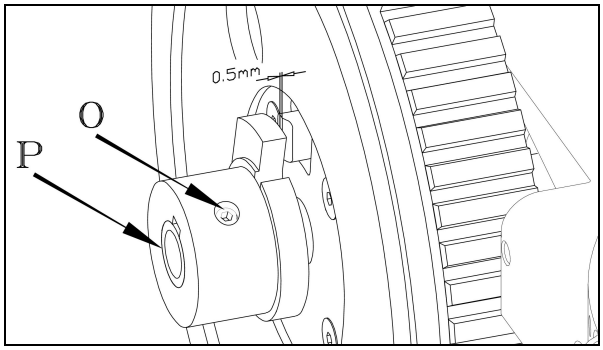


Fig 1

7. Adjust Driving Collar & Driven Collar

< The driven collar should be flush with the end of the shaft at point **(P).** *Loosen screw* **(O)** *and adjust as necessary before making the following adjustment >*

Manually turn the machine until the stop bolt just clears the stop wheel, and the machine is now in the sewing cycle. Check the distance between the driving collar and driven collar, Fig 1. It should be 0.5mm . To adjust, lift the machine head back and loosen screws **(R),** reference Fig 2. Move the pulley as necessary to adjust the clearance.

After making the adjustment, turn the machine through a complete cycle and re-check.

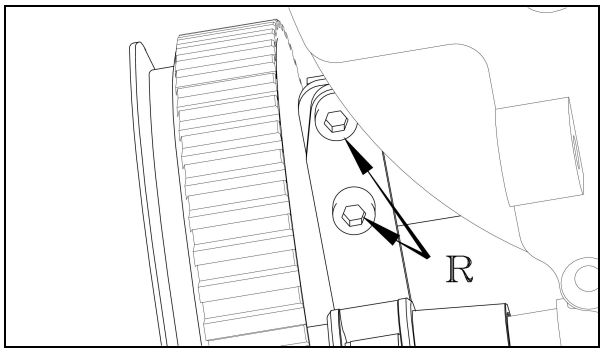


Fig 2

8. Adjust Roller on Stop Wheel

Referring to P9, Fig 2, continue turning the machine head towards the back until roller **(G)** has gone over point **(J),** and is released.

Refering to Fig 3, check the distance between the roller **(S)** and the ring **(T).** It should be 0.5mm. Loosen screw **(N)** on the stop bolt catch **(M),** Fig 4, and insert a pin in the hole of the block. Rotate the stop bolt catch to obtain the clearance between the roller **(S)** and the ring **(T).**

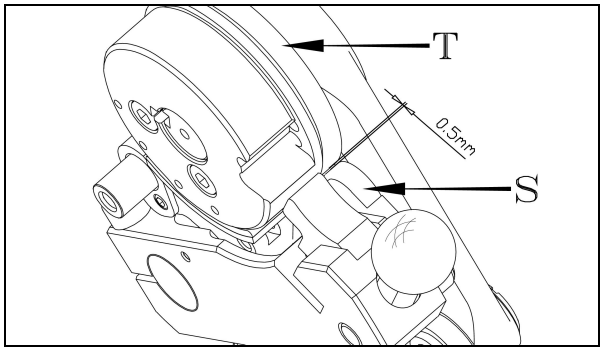


Fig 3

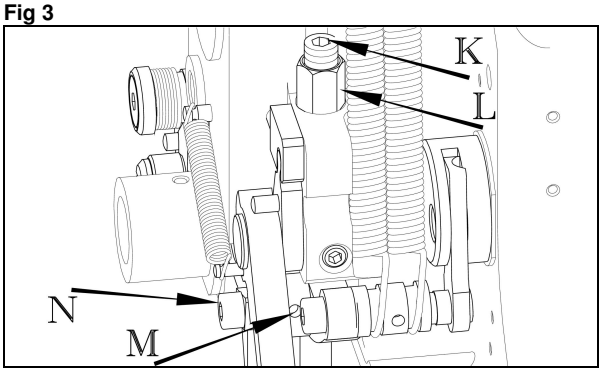


Fig 4

9. Adjust Collars - Cut After Mode

< Loosen screws (D) in Fig 3. Do not tighten until adjustment 12 on the next page. Turn the machine to the eye position for easier access to the screws >

Turn the machine through it's cycle. As it comes to the end of the cycle, lock up the machine. Continue turning until the machine head reaches home position in the cut after mode. At this point, make the following adjustment.

Loosen screws **(A)** & **(B)** on the CB/CA lever, Fig 1 . Move the screw **(A)** to obtain a clearance of 0.5mm between the driving collar and driven collar, as in Fig 2.

Tighten screw **(A)**. Check the adjustment again. Do not tighten screw **(B)** at this time.

10. Adjust Collars - Cut Before Mode

Set the machine to the cut before mode (refer to P8).

Turn the machine through it's cycle. As it comes to the end of the cycle, lock up the machine. Continue turning until the machine head reaches the home position in the cut before mode. At that point make the following adjustment.

Adjust the block **(C)** for a clearance of 0.5mm between the driving collar and the driven collar as in Fig 2.

Tighten screw **(B).** Check the adjustment again.

The following adjustments can be made in either the cut after or the cut before mode.

11. Adjust Eccentric Screw on CB/CA Slide

Loosen screw **(E)** in Fig 3. Adjust eccentric **(F)** for the CB/CA slide to lightly touch the bedplate. Tighten screw **(E)** and turn the CB/CA selector cap. The CB/CA slide **(G)** should move freely.

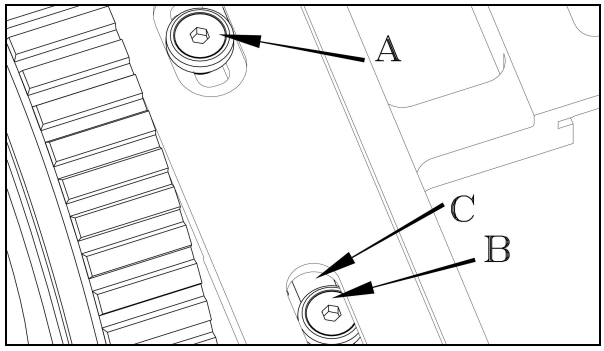


Fig 1

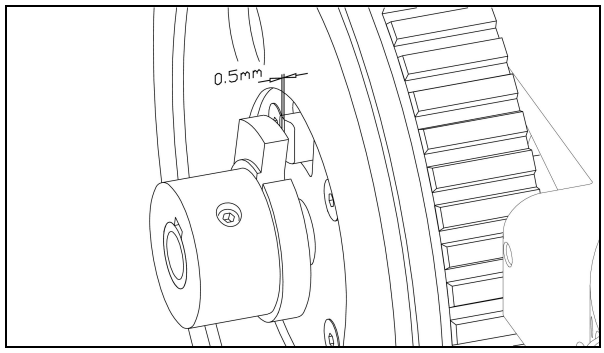


Fig 2

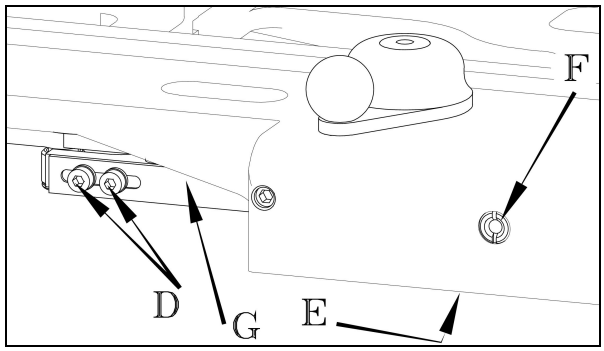


Fig 3

12. Adjustment of the Pin in the CB/CA Slide

The machine should be in the eye position from the instructions per item 9 of P11 and screws **(B)** should be loose.

Move the CB/CA slide **(A)** such that the pin **(C)** is in the center of the slot as shown in Fig 2. Tighten screws **(B).**

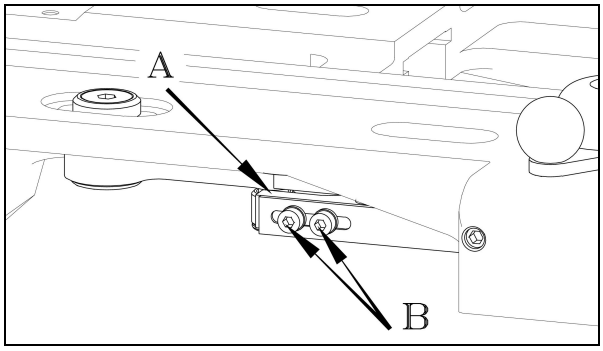


Fig 1

13. Release of Stop Bolt at the Finish of Sewing

Note: Before making the following adjustment, remove the brake pressure on the stop wheel as described in adjustment 14 on the next page.

The release of the stop bolt can be adjusted by rotating the ring **(D)** in Fig 3. There are four positions to choose. The factory adjustments are normally set at positions 2 or 3.

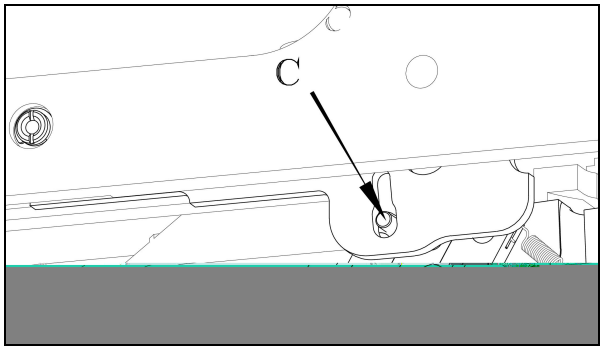


Fig 2

This adjustment will affect the timing of the stop bolt making contact with the stop wheel at the finish of sewing. This will affect the rotating speed of the shaft of the head cam due to the friction being applied by the stop bolt to the stop wheel.

For easier adjustment, unlock the machine and turn the stop wheel until the flat spot of the ring **(D)** is at the top, as shown in Fig 3.

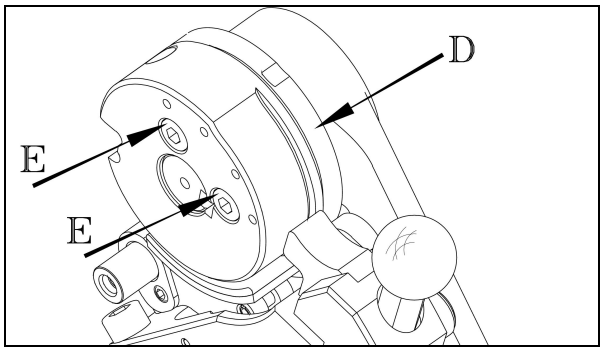


Fig 3

Remove screws **(E)** to rotate the ring. Align the flat spot on the ring with one of the points on the stop wheel.

If the ring is rotated clockwise, this will delay the release of the stop bolt. This will cause the shaft of the head cam to rotate at a faster speed at the moment the machine stops sewing. This will create a “hard” stop.

If the ring is rotated counter clockwise, the stop bolt will release sooner. This will cause the shaft of the head cam to rotate at a slower speed at the moment the machine stops sewing. This will create a “soft” stop.

The preference is to have the machine come to a “soft” stop.

14. Brake Adjustment on Stop Wheel

The affect of the following adjustment is similar to the previous adjustment. It is meant to create a “soft” stop at the end of sewing when the machine locks up.

The brake (**A**) as shown in Fig. 1 applies pressure to the stop wheel just prior to the machine locking up. The final adjustment should apply maximum break pressure, but still allow the machine to lock up at the end of sewing.

Turn the machine to the home position.

a. Loosen set screw (**B**) and turn screw (**C**) inwards by 1-2 turns to increase the brake pressure. Run the machine. The stop bolt should not fall into the slot of the stop wheel, as shown in Fig. 1. You will have to manually pull the stop bolt into the slot of the stop wheel.

b. Now turn screw (**C**) outwards by 1/4 turn. Run the machine to see if the stop bolt falls into the slot without manual assistance. Continue this adjustment until the stop wheel falls into the slot without manual assistance. Tighten screw (**B**).

NOTE: The stop bolt will fall into slot at the end of sewing. However, if you are turning the machine with the handwheel, you will have to manually pull the stop bolt into the slot of the stop wheel to lock up the machine.

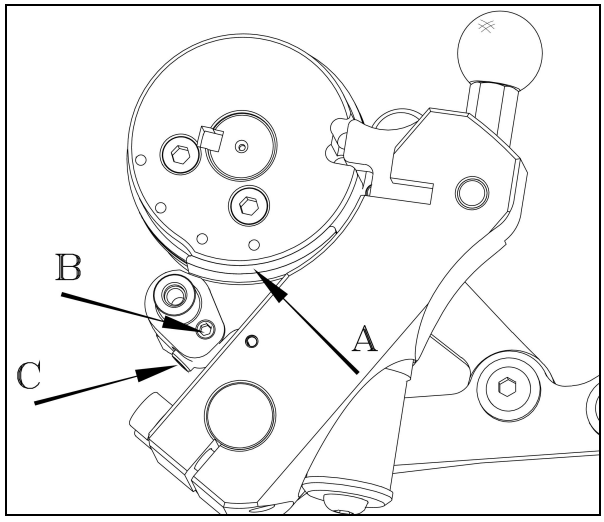


Fig 1

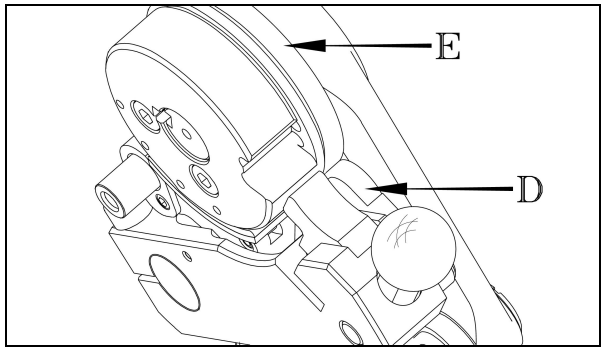


Fig 2

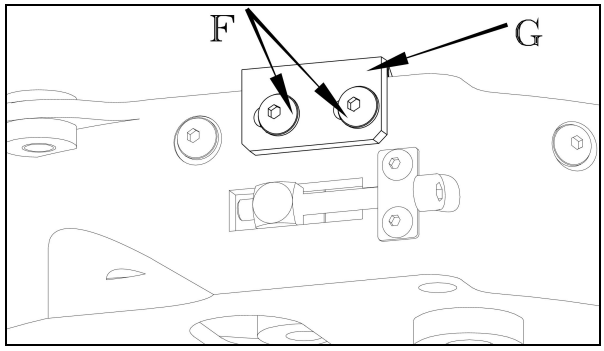


Fig 3

15. Safety Stop

When the machine has finished sewing, the machine should then be in locked position and the sewing head should travel forward. If for some reason the needle bar does not return to the top position, the machine head will not move. This is to prevent the machine head from feeding forward with the needle in the down position.

To adjust, turn the machine to the home position. Unlock the machine, and turn the stop wheel until the roller (**D**) in Fig 2 is resting against the ring (**E**) (*not on the flat spot*).

Referring to Fig 3, tilt the machine head back, loosen screws (**F**) and pull plate (**G**) all the way forward. Tighten the screws.

THREAD DRAW-OFF

Set the machine in the cut after mode (see P8). With the machine sitting in the home position, the push rod **(A)** should be at the start of the slope of the thread draw-off cam **(B)**, as shown in Fig 1. To adjust, loosen screws **(C)** and rotate the cam. This will allow for maximum thread draw off for the top thread.

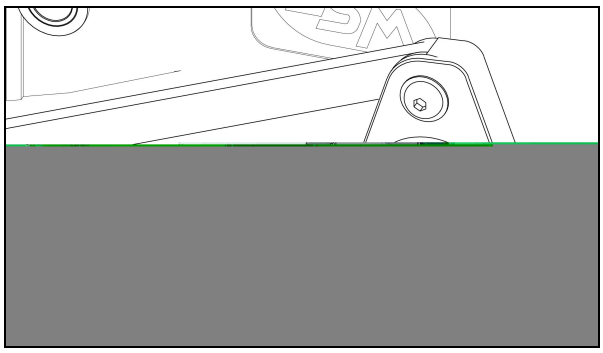


Fig 1

SPECIAL TENSION RELEASE

The K150 has a patented thread handling system which releases the tension on the top thread during the sewing cycle at pre-determined points, to allow for better thread control in difficult sewing conditions.

Under normal sewing conditions, thread tension is applied to the thread at all times. For difficult threads or fabrics, the spring tension applied against the tension disk **(D)** in Fig 2 can be adjusted, which will release the spring tension approximately 3-4mm before the needle bar reaches its lowest point. This allows the top thread to relax, forming a larger loop for the loopers.

< This setting should not be used for normal threads & fabrics as the thread loops could be too large, creating sewing problems >

To set the top thread tension for special threads & fabrics, *rotate the tension adjusting washer* **(F)** *clockwise 1/4 of a turn*. To test the tension release system, ⚠ turn off the motor and manually turn the needle bar through the sewing cycle, observing the tension release disk **(E).** Just before the needle bar reaches its lowest point the disk should open approximately 0.5-0.7mm releasing the spring tension on the tension disk **(D).** Turn the adjusting washer **(F)** as required to obtain the correct distance for the disk to open. *The disk should not open more than 0.7mm*.

To dis-engage the tension release system, turn the tension disk counter clockwise 1/4 of a turn, and test the system.

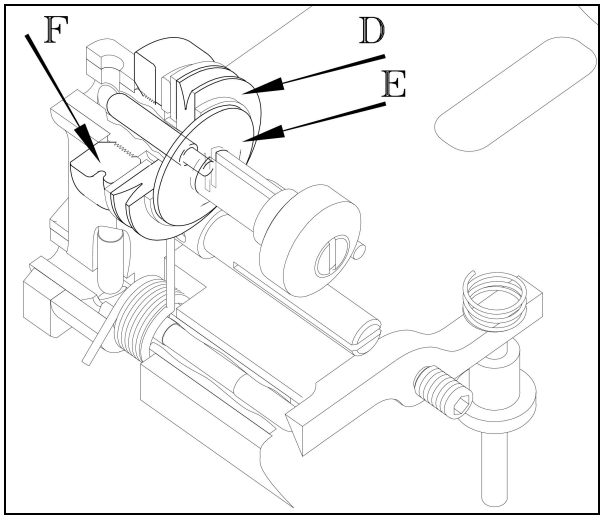


Fig 2

TENSION RELEASE ADJUSTMENTS

Adjustment of Tension Release Pins

The tension release system, during the sewing cycle, is determined by the movement of the pins **(A)** located in the head cover and top thread tension assembly, noted in Fig 1.

These pins are operated by the movement of the shaft **(B)** located in the needle bar lever **(C)** shown in Fig 2, and pin **(D).**

Pins **(A)** are beveled on one end, and should be installed to work in alignment with each other. To test, remove the head cover and turn upside down. Manually move the lever **(F)** in the head cover, and observe the opening and closing of the tension release disk **(E).** If the tension release disk does not open, check the pins for correct alignment, and the condition of the tension release disk **(E).**

Do not re-install the head cover unless the tension release disk **(E)** is opening & closing freely.

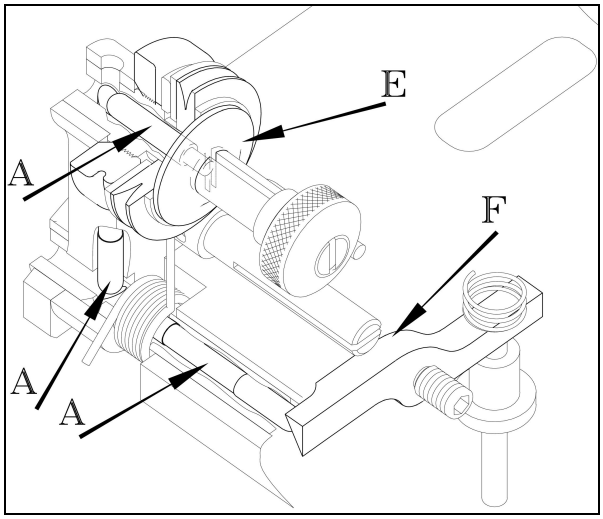


Fig 1

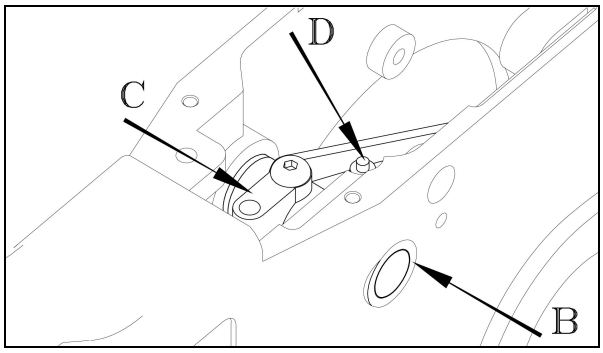


Fig 2

TENSION RELEASE ADJUSTMENTS

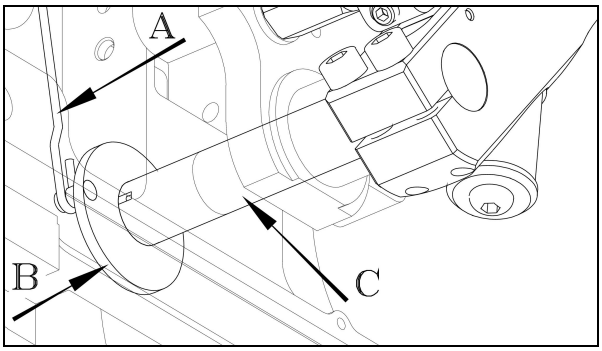


Fig 1

Adjustment for Tension Release at the End of Sewing

At the end of the sewing cycle the tension release pins (on P15), are controlled by the tension release wire **(A)** in Fig 1 above, the tension connector **(B),** and the rotation of the stop bolt shaft **(C)**

When the machine stops sewing, the shaft **(C)** rotates slightly, causing the tension connector **(B)** to pull down the tension release wire **(A).** When the tension release wire is pulled down, the tension release disk **(E),** as noted on P15, is opened through the movement of the various tension release pins.

This adjustment has to be made in the following sequence to obtain the correct settings:

1. **First, adjust the distance tension release disk (E) as it opens & closes during the sewing cycle, as described on P14.**

   ⚠ Turn off the motor. Turn the adjusting washer **(F)** clockwise until it touches the tension bracket. Then rotate the collar counter clockwise 1 full turn. Tension should now be applied to the thread at all times during the sewing cycle.

   Turn the needle bar to the down position. Pull the thread through the tension system, and at the same time, slowly turn the collar clockwise. When the tension is released on the thread, stop turning the collar. Go to the next page for adjustment 2.

Adjustment for Tension Release at the End of Sewing

2. Second, adjust the setting of the tension release disk when the machine has stopped sewing

As explained on P16, the opening of the tension release disk **(E)** at the end of the sewing is controlled by the movement of the stop bolt shaft **(C).** The tension release disk should open 0.5-0.7mm.

The following is to adjust the rotation of the stop bolt shaft **(C).** The machine should be sitting in home position. ⚠ Turn off the motor.

a) If the tension release disk does not open enough, adjust as follows, referring to Fig 1 below:

1) Loosen screws **(A)** on the stop bolt holder, and push back the stop bolt holder by approximately 3mm. Tighten the screws.

2) Loosen screw **(B)** which clamps the stop bolt shaft. Leave the screw loose.

3) Pull the stop bolt forward. This will rotate the stop bolt shaft, as well as the tension release disk, in a counter clockwise movement.

4) Pull the stop bolt tight against the stop wheel **(C).** Lockup the machine and tighten screw **(B).**

5) Check the distance the tension release disk opens by unlocking and locking the machine.

b) If the tension release disk opens too far, adjust as follows:

1) Loosen screw **(B)** which clamps the stop bolt shaft. Leave the screw loose.

2) Push back the stop bolt holder by approximately 3mm.

3) Tighten screw **(B).**

4) Loosen screws **(A)** and pull the stop bolt holder tight against the stop wheel **(C).**

5) Continue holding the stop bolt holder tight against the stop wheel and lockup the machine. Tighten screws **(A).**

6) Check the distance the tension release disk opens by unlocking and locking the machine.

3. Referring to P14, rotate the collar (F) counter clockwise by 1/4 turn. This will turn off the tension release mechanism. To turn on, rotate the collar clockwise by 1/4 turn.

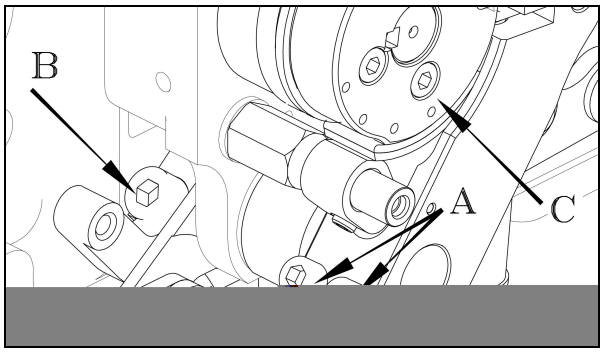


Fig 1

The following schedule gives the sequence of adjustments for the needle bar, loopers, spreaders, cutting space, and stitch bite. It is very important to follow this sequence in order to obtain the correct settings in the cut before and cut after modes.

The K150 has a unique system for changing the stitch bite and cutting space for cut before and cut after buttonholes. First, the stitch bite and cutting space of a cut before buttonhole is pre-set. Then the stitch bite and cutting space of a cut after buttonhole is pre-set.

Once these settings are made, the correct stitch bite and cutting space will be automatically be set when changing to the cut before or cut after modes (see P8 for changing to cut before or cut after). The looper settings are described below under the section “Looper Timing - Special Adjustments”.

If the machine is used as a dedicated cut before or cut after, then the looper settings are described below under the section “Looper Timing - Normal Adjustments”.

< These settings are for average weight fabrics. Adjustments may vary for extremely heavy fabrics, or for very light weight fabrics >

⚠ Turn off the motor before adjusting.

Checking Sequence	Adjustment	Page	Ref
1	Set adjustment plate in center of travel	19	1
2	Set cut before stitch bite to 3.2mm	19	2
3	Set cut after stitch bite to 2.4mm	19	3
4	Set cutting space to 0mm in cut before mode	19	4
5	Set cutting space to 0.3mm in cut after mode	20	5
6	Re-set cutting space to 0mm in cut before mode	20	6
7	Re-check cutting space for 0.3mm in cut after mode	20	7
8	Check throat plate	21	8
9	Looper timing - normal adjustments	21	9
10	Looper timing - special adjustments	23	10
11	Adjust needle bar height	25	11
12	Adjust needle clearance with loopers	25	12
13	Adjust needle clearance to needle guard	25	13
14	Adjust spreaders	26	14

1. Set Adjustment Plate

The positioning of the following screws and plate are only preliminary adjustments. Loosen screws **(A)** & **(B)** in Fig 1. Move the adjusting plate **(C)** to the center of its travel and tighten screw **(B).** Loosen set screws **(D).** Turn adjusting screws **(E)** & **(F)** outwards.

In making the following adjustments, use a new needle. Insert a thick piece of paper under the clamps. Unlock the machine by pushing back on knob **(G)** as shown in Fig 2. Manually turn the machine through the stitching cycle, making needle imprints on the paper.

2. Set Stitch Bite in Cut Before Mode

Move the adjusting screw **(A)** to the CB position and tighten. Turn the machine through the stitching cycle, producing needle imprints on the paper. Refer to Fig 3, picture #2. Measure the width of the stitch bite. It should be 3.2mm as shown in 2a. Move the adjusting screw **(A)** forward to increase the stitch bite, or backwards to decrease. Once the correct stitch bite is set, tighten screw **(A).** Turn the adjusting screw **(E)** inwards to lightly touch the adjusting plate. Tighten the set screw **(D).**

3. Set Stitch Bite in Cut After Mode

Move the adjusting screw **(A)** to the CA position and tighten. Turn the machine through the stitching cycle, producing needle imprints on the paper. Refer to Fig 3, picture #1. Measure the width of the stitch bite. It should be 2.4mm as shown in 1a. Move the adjusting screw **(A)** forward to increase the stitch bite, or backwards to decrease. Once the correct stitch bite is set, tighten screw **(A).** Turn the adjusting screw **(F)** inwards to lightly touch the adjusting plate. Tighten the set screw **(D).**

4. Set Cutting Space in Cut Before Mode

Move the adjusting screw **(A)** to the CB position and tighten. Refer to Fig 3, picture #2. Check the cutting space between the two rows of stitches. It should be set at zero; i.e., no cutting space as shown in 2b.

Loosen screws **(J)** on the adjusting plate **(H)** as shown in Fig 4. Move the plate clockwise to increase the cutting space, or counter clockwise to decrease. Tighten the screws **(J).**

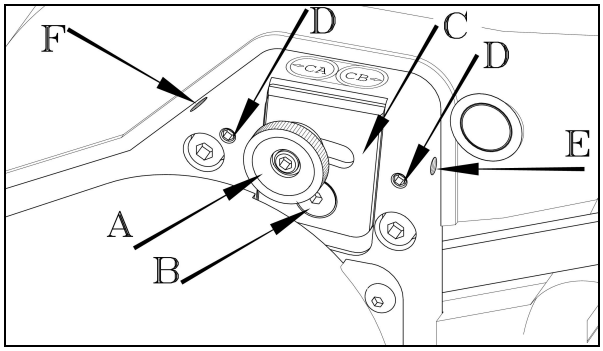


Fig 1

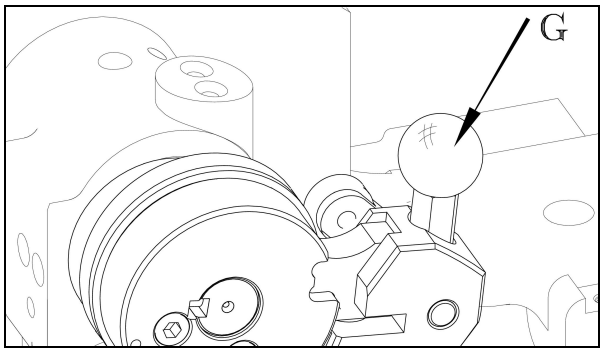


Fig 2

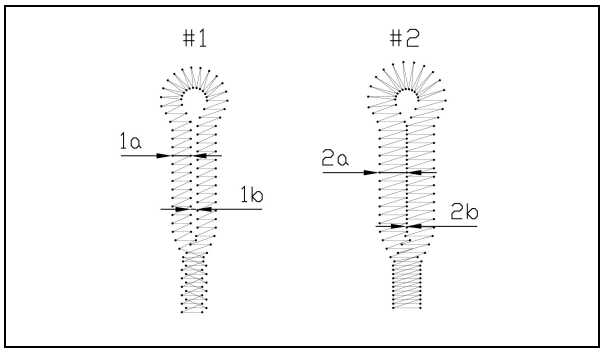


Fig 3

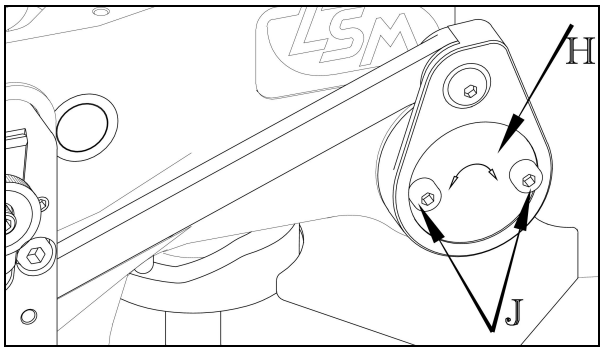


Fig 4

5. Set Cutting Space in Cut After Mode

< This setting is for average weight fabric >

Move the adjusting screw **(A)** to the cut after position and tighten. Refer to P19, Fig 3, picture #1. Check the cutting space between the two rows of stitches. It should be set at 0.3mm as shown in 1b. Loosen screw **(B)** as shown in Fig 1 and move the adjusting plate **(C)** upwards to increase the cutting space, or downwards to decrease.

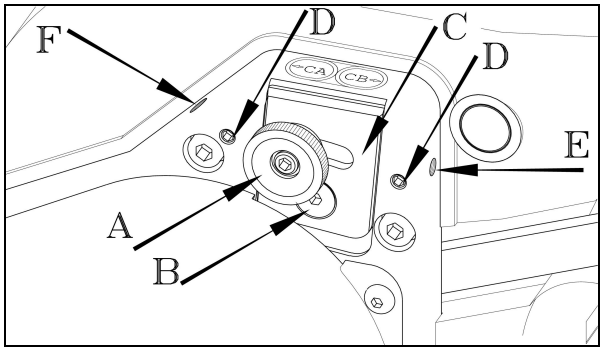


Fig 1

6. Re-set Cutting Space in Cut Before Mode

Move adjusting screw **(A)** to the cut before position, and repeat adjustment 4.

7. Re-set Cutting Space in Cut After Mode

Move adjusting screw **(A)** to the cut after position, and check adjustment 5. Change if necessary.

< Due to the mechanical relationship of these adjustments in the cut after and cut before mode, it may be necessary to repeat adjustments 6 & 7 several times before the correct adjustment is obtained >

8. Throat Plate

When installing a new throat plate, check for needle clearance at the back of the throat plate as shown in Fig 1. There should be 0.5mm clearance. Depending on the size of the needle used, it may be necessary to cut the throat plate with emery paper.

Polish the top and bottom of the throat plate with a buffing wheel to insure smooth thread flow during sewing.

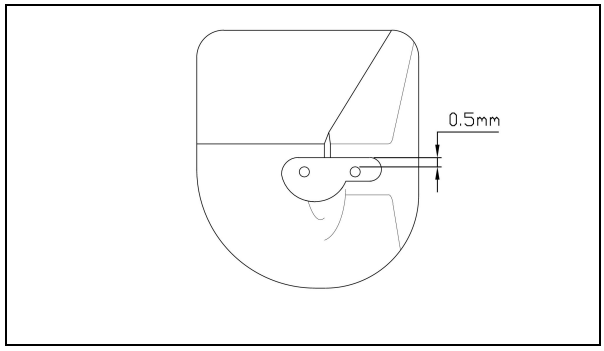


Fig 1

9. Looper Timing - Normal Adjustments

If the machine is used primarily as a cut before or cut after, then adjust the loopers as below. If the machine is constantly changed between the cut before & cut after modes, then adjust the loopers as described on P 23.

Before adjusting the loopers, check for excessive movement in the area of the split collar yoke, as shown in Fig 2. Loosen screw **(A)** and tighten the yoke just enough to remove any movement. *Do not overtighten or it will create a bind as the machine goes around the eye.*

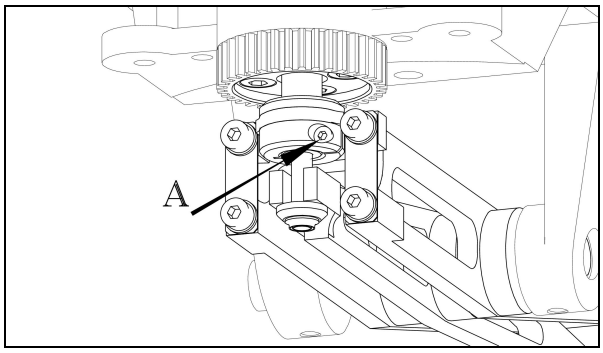


Fig 2

Inspect the loopers for any rough spots which may have been caused by the needle striking them.

Always keep the loopers polished to a very high finish for smooth thread handling, especially the left looper. The loop must slide all the way back to form a good stitch.

Carefully evaluate the position of the loopers before making any adjustments.

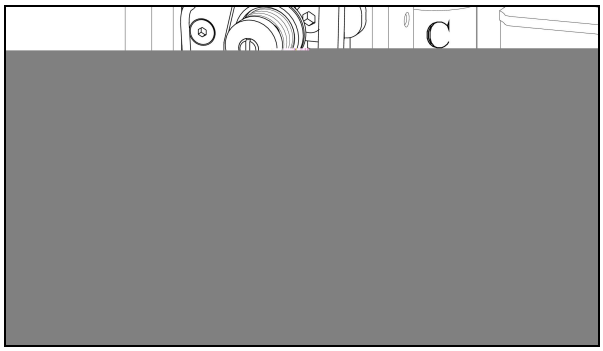


Fig 3

Two adjustments are available for altering the setting of the loopers. Both are normally used in setting the loopers.

1. By loosening screw **(B)** on the yoke as shown in Fig 3 and moving the looper link **(C)** up or down, this will make one looper faster and the other looper slower.

2. By loosening screw **(D)** as shown in Fig 4 and rotating the core in a clockwise movement, this will make both loopers faster. Rotating in a counter clockwise movement will make both loopers slower.

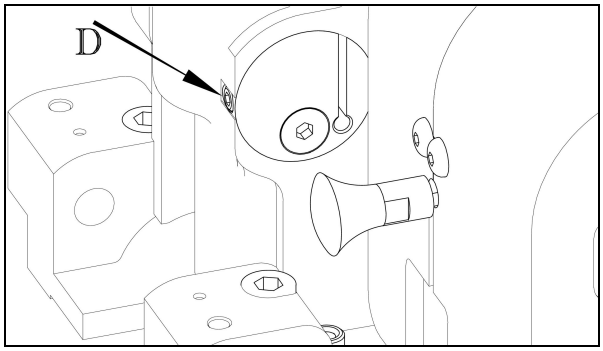


Fig 4

9. Looper Timing - Normal Adjustments

The machine can be adjusted in either the cut before or cut after mode.

Adjust the loopers per the following:

a. Unlock the machine and turn the needle bar all the way down. Bring it up 2.5mm.

b. The bottom point of the left looper should be in the center of the needle as shown in Fig 1.

c. Turn the needle bar down again, and bring it up 2.5mm. The bottom point of the right looper should be in the center of the needle as shown in Fig 2.

d. Adjust the loopers with the adjustments as described on P23.

e. Repeat the adjustments as necessary.

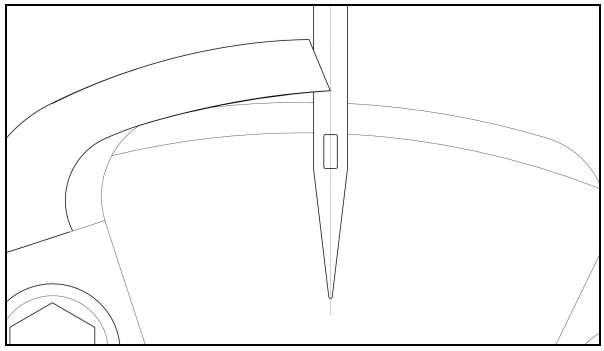


Fig 1

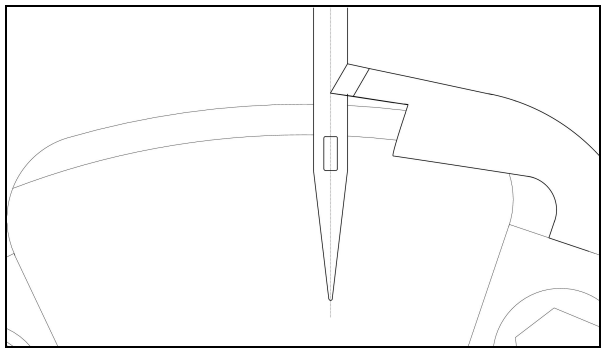


Fig 2

10. Looper Timing - Special Adjustments

If the machine is continuously changed between the cut before and cut after modes, then adjust the loopers as described below. If the machine is used primarily as a cut before or cut after, then adjust the loopers as described on P21.

Before adjusting the loopers, check for excessive movement in the area of the split collar yoke, as shown in Fig 1. Loosen screw **(A)** and tighten the yoke just enough to remove any movement.

Inspect the loopers for any rough spots which may have been caused by the needle striking them.

Always keep the loopers polished to a very high finish for smooth thread handling, especially the left looper. The loop must slide all the way back to form a good stitch.

Because of the unique adjustments for the stitch bite and cutting space for the cut before and cut after modes, the setting of the loopers with the needle rise is variable. *Use the following procedures to evaluate the setting of the left and right loopers before any adjustments are made*:

a. Unlock the machine and turn the needle bar all the way down. Bring it up 2.5mm.

b. Loosen screw **(B)** in Fig 2. Move the screw back and forward to the CB & CA positions, watching the movement of the needle in relation to the point of the left looper.

   With screw **(B)** in the cut after mode, the point of the looper should be as Fig 3.

   With screw **(B)** in the cut before mode, the point of the looper should be as Fig 4.

.

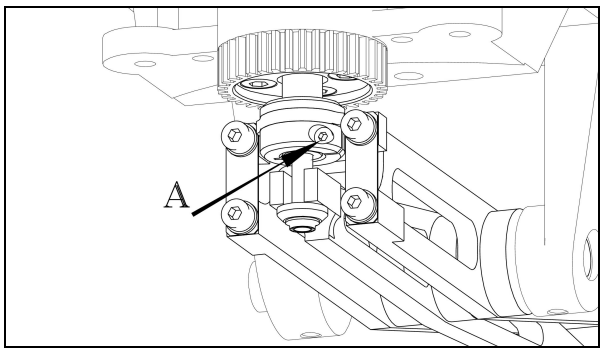


Fig 1

Fig 2

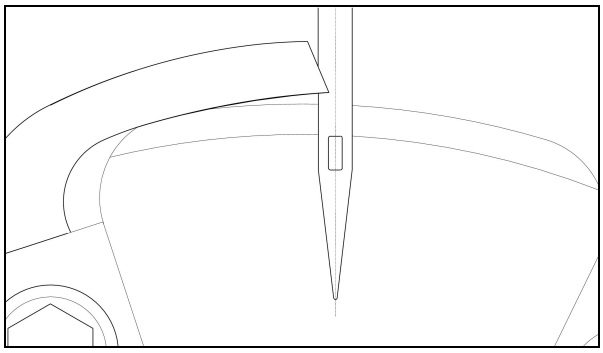


Fig 3

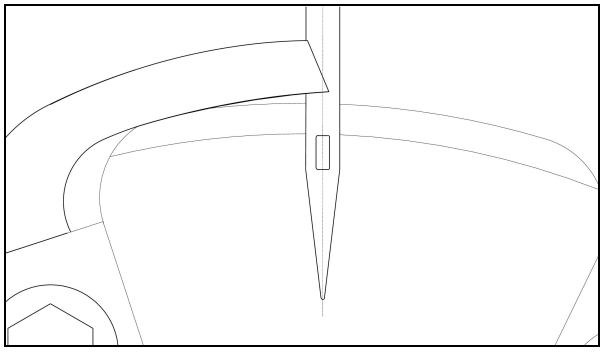


Fig 4

10. Looper Timing - Special Adjustments

c. Bring the needle bar to the up position, and again turn all the way down, and bring it up 2.5mm. Grasp the adjusting screw **(B)** as shown on P23, fig 2 and move back and forward to the CB & CA positions, watching the movement of the needle in relation to the point of the right looper

With screw **(B)** in the cut after mode, the point of the looper should be as Fig 1.

With screw **(B)** in the cut before mode, the point of the looper should be as Fig 2.

Carefully evaluate the position of the loopers as described on P23 before making any adjustments.

Two adjustments are available for altering the setting of the loopers. Both are normally used in setting the loopers.

1. By loosening screw **(A)** on the yoke as shown in Fig 3 and moving the looper link **(B)** up or down, this will make one looper faster and the other looper slower.

2. By loosening screw **(C)** as shown in Fig 4 and rotating the core in a clockwise movement, this will make both loopers faster. Rotating in a counter clockwise movement will make both loopers slower.

If adjustments are necessary, use the following procedures:

a. Check the setting of both loopers, using the procedures on P23, to determine which adjustment to make.

b. Make the adjustment as necessary, and check both loopers again using the same procedures on P23.

c. Repeat steps (b) and (c) until both loopers are set correctly.

d. Tighten screw **(B)** on P23, Fig 2 in the required mode (cut before or cut after).

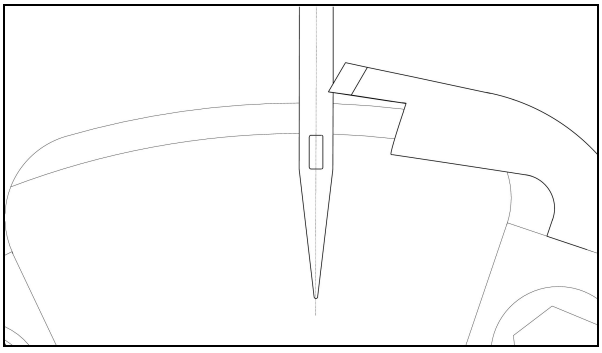


Fig 1

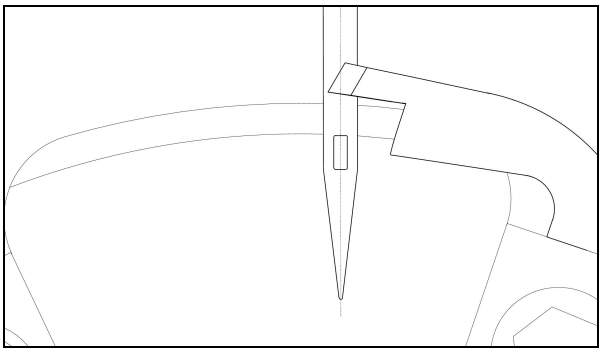


Fig 2

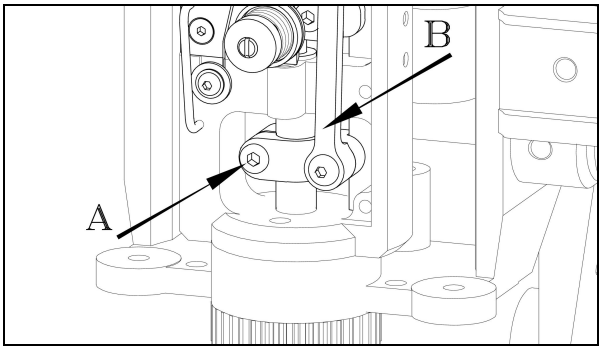


Fig 3

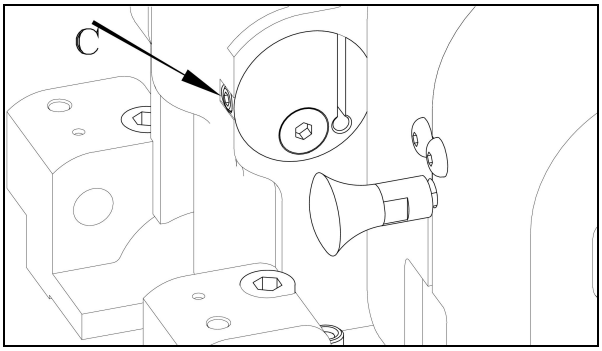


Fig 4

11. Needle Bar Height

Unlock the machine and turn the needle bar down to it's lowest point. The top of the needle bar should be 6.6mm above the surface of the cap, as shown in Fig 1.

Loosen screws (**A**) in Fig 2 and adjust the needle bar height as necessary.

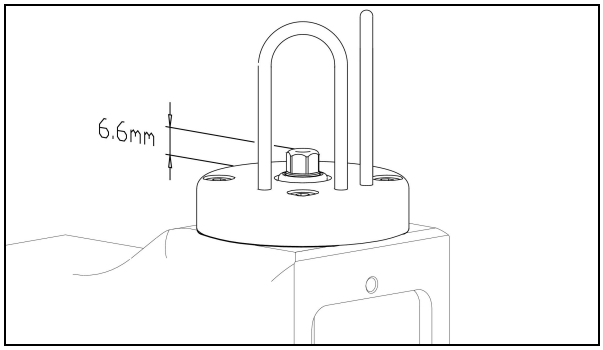


Fig 1

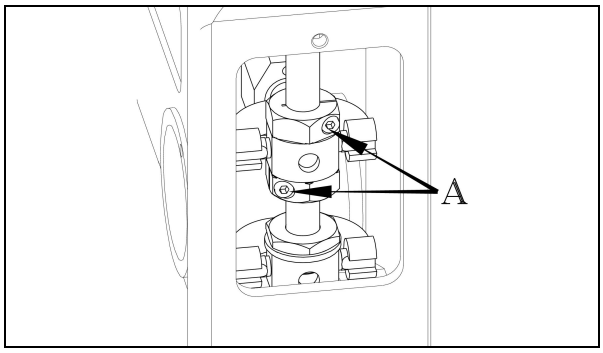


Fig 2

12. Needle Clearance

a. Unlock the machine and turn the needle bar all the way down. Bring it up until the point of the looper is in the center of the needle.

b. Set the clearance between the needle and the looper at 0.3 - 0.5mm as shown in Fig 3.

c. Use the same procedure for setting the clearance for the other looper.

d. Turn the machine to the second side of the buttonhole and check the clearance to both needles. If adjustment is necessary, refer to P28.

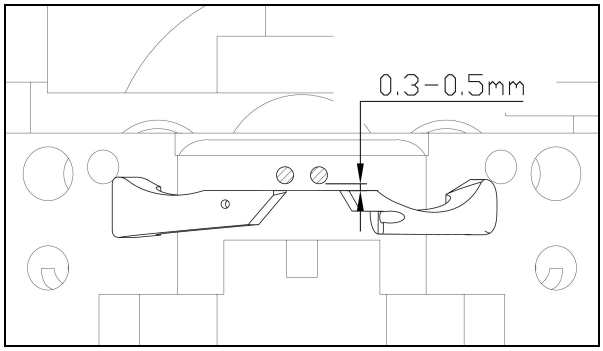


Fig 3

13. Needle Guard

The needle guard should be set 0.5mm from the needles, as shown in Fig 4. The guard can be bent slightly without removing from the machine.

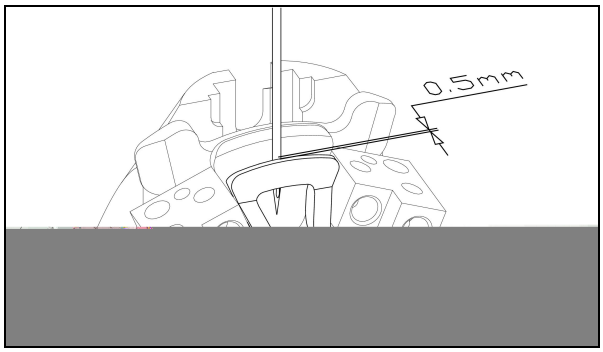


Fig 4

14. SPREADER ADJUSTMENTS

Adustment of Spreaders

< If the spreader spindle 114-013-020 and spreader rocker113-066-020 have been replaced, see P27 for adjustment of spreader spindle and spreaders >

Inspect both spreaders for any rough edges, and polish to a high finish for smooth thread handling.

All adjustments are made with the machine in the cut after mode (see P8), for which the spreaders are set very close to the needle. After the adjustments are made, change the machine to the cut before mode to inspect the distance between the needle and spreaders. Normally there will be a wider clearance.

a. Change the machine to the cut after mode (see P8).

b. Adjust the spreader stops as in Fig 1, positioning the spreaders over the loopers as shown. The fork of the left spreader should be centered over the thread hole of the left looper. The right spreader should be even with the back side of the right looper.

   The spreaders should be 0.5mm above the loopers. Remove the spreaders and bend as necessary.

   The needle should never come in contact with the spreaders. The clearance between the needle and spreaders should be approximately 0.5mm when the needle is descending, as shown in Figures 3 & 4.

c. Adjust the left spreader first. If adjustment is necessary, loosen the nut **(A)** on the spreader wire in Fig 2. Turn the screw **(B)** inwards to increase the distance between the spreader and needle. Turn outwards to decrease the distance.

d. Check the right spreader. It should have the same clearance as the left spreader. If necessary to adjust, remove the spreader and bend.

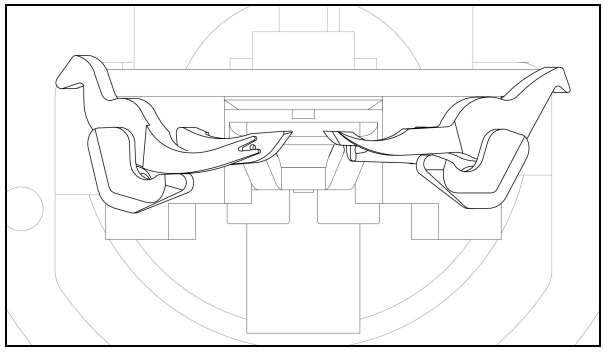


Fig 1

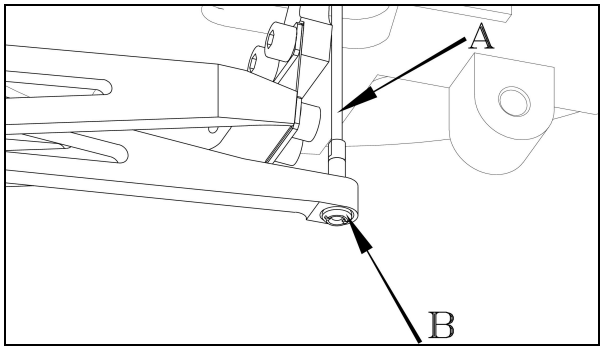


Fig 2

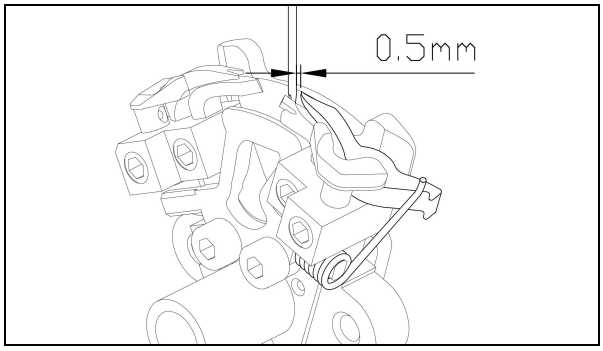


Fig 3

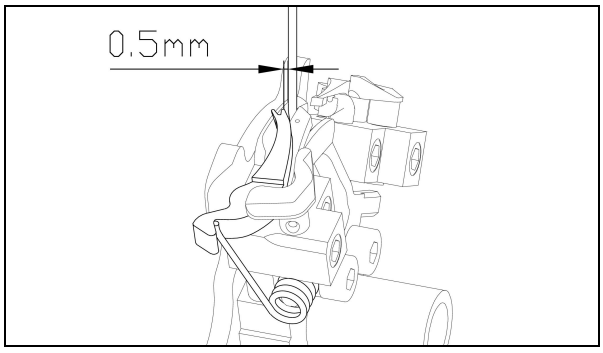


Fig 4

14. SPREADER ADJUSTMENTS

Adjustment of Spreader Spindle & Spreaders

< This adjustment is only necessary if the spreader spindle and spreader rocker have been removed and are re-installed >

The adjustment of spreader spindle **(A)** in Fig 1 determines the movement of the spreader rocker lever **(G),** as shown in Fig 2 and Fig 3. The purpose of this adjustment is to equalize the movement to prevent the spreader rocker from making contact with related parts.

a. Change the machine to the cut after mode (see P8). Remove the needle from the needle bar.

b. Install the spreader rocker lever **(G).** Do not install the spreader spindle **(A)** until later.

c. Connect the screw **(E)** in Fig 2 to the spreader wire **(D).** Turn the screw inwards 3-4 turns.

d. Unlock the machine and manually turn the machine through its sewing cycle, and at the same time, apply light upward pressure on the front of the spreader rocker lever, at point **(K)** in Fig 3.

e. Check the distance between the spreader rocker lever and looper rocker lever at point **(F)** in Fig 2.

f. Continue turning the machine and check the distance between the spreader rocker lever and the adjustable collar at point **(H)** in Fig 3.

g. Adjust screw **(E)** until the distances at points **(F)** and **(H)** are approximately the same.

h. Install spreader spindle **(A)** in Fig 1. Push the spreader spindle upwards until it is approximately 2mm above the spreader crosshead **(C)** and tighten screw **(B).** Install a new needle in the needle bar.

   The following is a preliminary adjustment. The final adjustment of the spreaders is made on P26.

i. Turn the machine through the sewing cycle, observing the distance between the left spreader and needle. It should be approximately 0.5mm. Loosen screw **(B)** and raise or lower the spreader spindle **(A)** in Fig 1 to adjust for the distance. When completed, tighten screw **(B).**

j. Go to P26 to complete the adjustments of the spreaders.

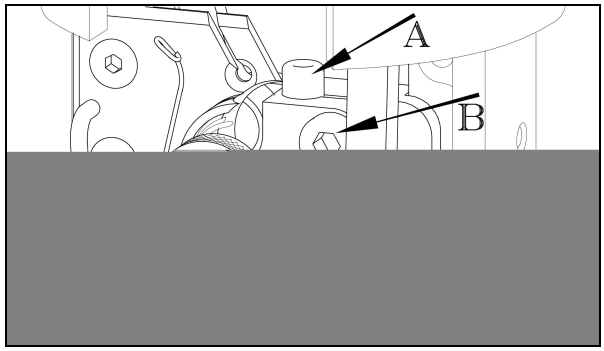


Fig 1

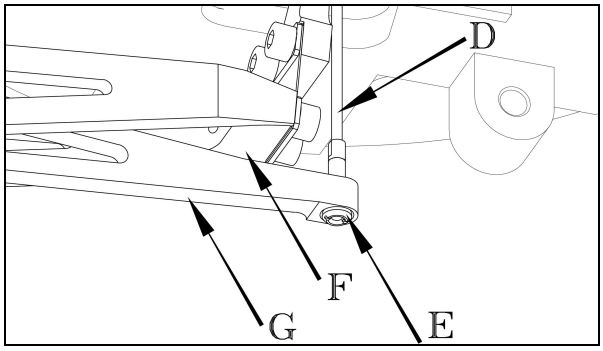


Fig 2

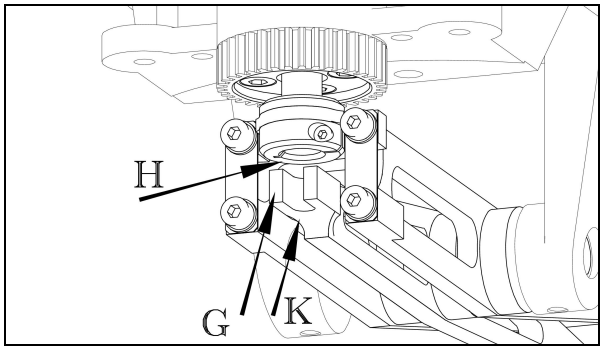


Fig 3

Adjusting the Needle Bar Diaphragm

< This is not a standard adjustment. This is pre-set at the factory and should not be adjusted unless the bushing or diaphragm is replaced >

During the sewing of a buttonhole, the distance between the needle and the loopers should be the same on both sides of the buttonhole.

1. ⚠ Turn off the motor. Insert a new needle in the needle bar.

2. Unlock the machine and turn the needle bar all the way down. Bring it up until the point of the looper is in the center of the needle.

3. Set the clearance between the needle and the looper at 0.5mm.

4. Do not move the needle bar or loopers. Manually turn the machine to the other side of the buttonhole and check the point of the looper to the needle, and the clearance between the needle and looper.

5. If the settings have changed, then loosen screws **(A)** in Fig 1. Slightly move the position of the diaphragm to adjust for the correct settings.

6. Start with Adjustment 2 and repeat until the settings are the same on both sides of the buttonhole.

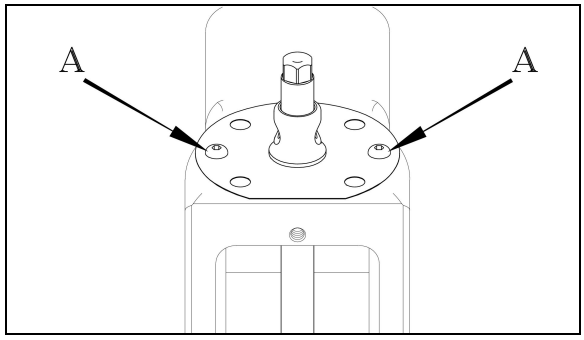


Fig 1

At the finish of the sewing cycle, the machine head continues it's movement to the home position, and the mechanism for trimming the top thread is actuated as per the following sequence:

1. Wedge **(A)** strikes roller **(B).**
2. Actuator **(C)** is then rotated, pulling down shaft **(D).**
3. Shaft **(D)** pulls down the trimmer holder **(E)** and the trimmer knife is pulled past the thread loop.
4. When the wedge **(A)** goes past the roller **(B),** the shaft **(D)** is released, allowing the trimmer to trim the front side of the thread loop.

To adjust the trimming mechanism, use the following procedure:

1. ⚠ Turn off the motor. Turn the machine head until the race turns and the trimmer holder is under the trimmer actuator, as in Fig 2, point **(F).**
2. Set the clearance at point **(F)** to 1.5mm. Loosen screws **(G)** in Fig 2 to adjust the height of the actuator button.
3. Turn the machine through a cycle until it comes to the trimming position. Turn the machine slowly, watching the travel of the knife. It should go past the point of the looper by 1mm as in Fig 3.

< If the knife travels too far past the point of the looper, the bottom thread from the opposite looper may be cut >

4. To adjust, loosen set screw **(H)** and adjust the rotation of the actuator **(C).** Tilt roller **(B)** up for more movement, or down for less movement.
5. To make very small adjustments on the movement of the trimmer knife, the actuator button can be adjusted as per step 2. *Be sure there is clearance between the actuator button and trimmer assembly.*

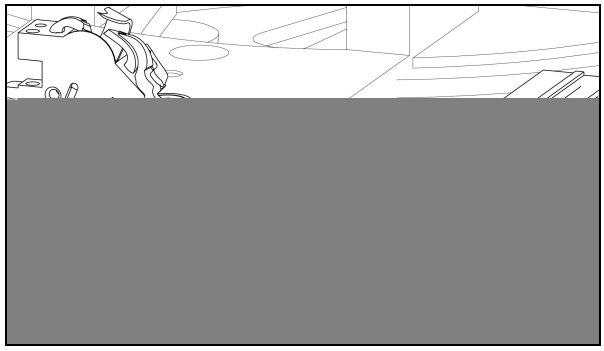


Fig 1

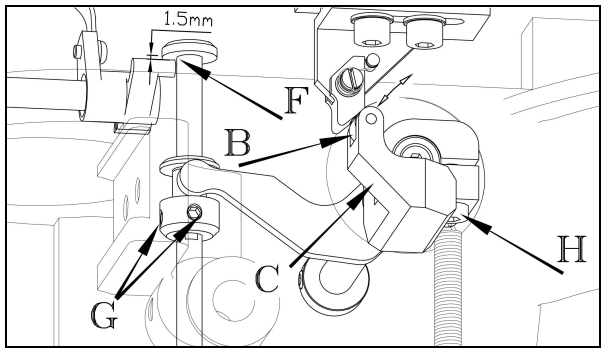


Fig 2

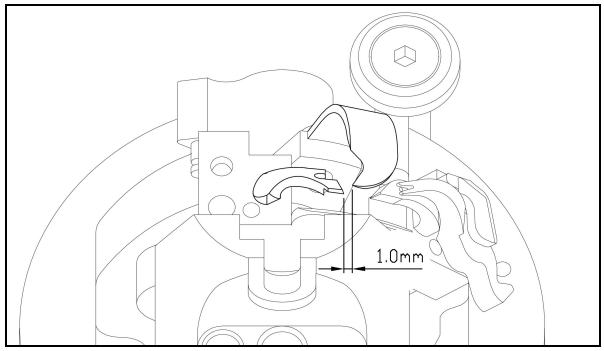


Fig 3

6. Adjust the height of the knife for a clearance of 0.2mm - 0.4mm from the underside of the throat plate.

7. Adjust the angle of the knife such that the point of the knife does not extend beyond the looper. Bend the knife if necessary.

   Re-check the height of the knife from the underside of the throat plate.

< The knife should only trim the inside thread loop. If it trims the outside thread loop, the starting thread will be too short for the next buttonhole >

8. The following adjustment controls the timing of the trimming cycle. Refer to Fig 1.

   The machine should be in cut before mode, and set for the maximum length buttonhole.

   Immediately when the machine stops sewing, the roller **(A)** should make contact with the wedge **(B).** Loosen the screws **(C)** and move bracket **(D)** to adjust.

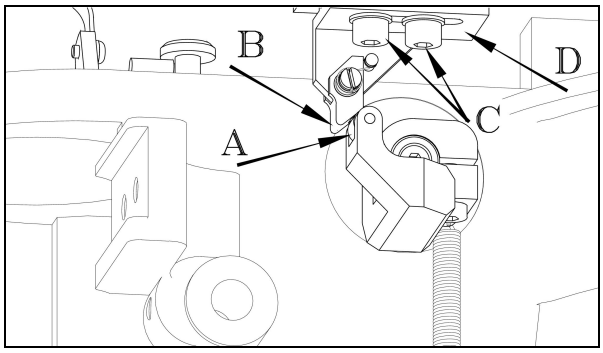


Fig 1

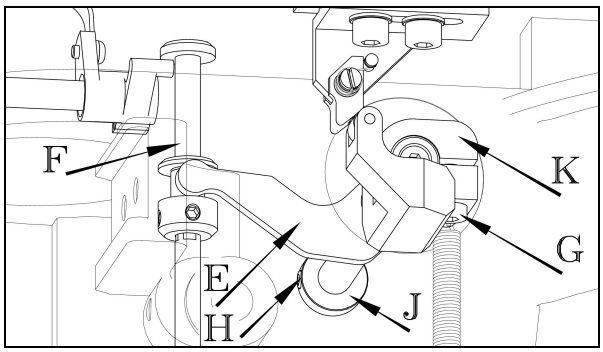


Fig 2

Adjustment of Trimmer Lever

The trimmer lever **(E)** in Fig 2 should move freely with the shaft **(F).** Adjust as follows.

1. Loosen screw **(G)** . Loosen screw **(H)** on the collar **(J).**

2. Position the lever **(E)** on the shaft **(F)** such that the shaft **(F)** moves up and down freely without binding.

3. Push the collar **(J)** and the bracket **(K)** against the casting, . Tighen screws **(G)** & **(H).**

4. Check that the trimmer lever **(E)** and shaft **(F)** move freely.

5. Refer to P29, and check the adjustment of the trimming mechanism.

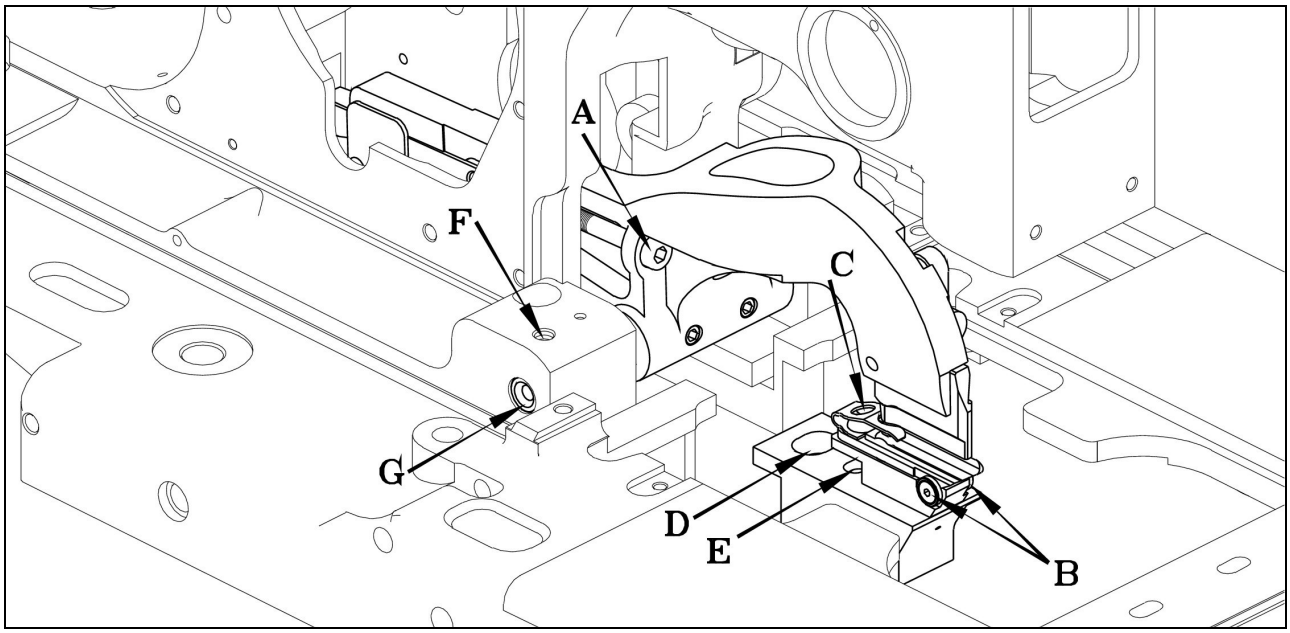


Fig 1

Cutting Pressure

Cutting pressure is changed by adjusting screw **(A).** Turning the screw in increases the cutting pressure. Turning it out will decrease the cutting pressure.

< Do not over increase the cutting pressure or the cutting lever can be damaged. To replace the cutting lever requires the sewing head to be removed. Refer to P57 >

After installing a new cutting block, first decrease the cutting pressure by backing out screw **(A).**

The cutting pressure should then be increased to the point that the fabric is cut cleanly. If excessive cutting pressure has to be applied, inspect the cutting knife, cutting cam, and cutting cam follower. Replace any items which may be excessively worn.

Locating the Cutting Knife

The knife holder is pre-set at the factory, and should not require any adjustments unless it has been removed.

The blade of the cutting knife can be moved from side to side by the adjusting screws **(B).** The position of the cutting eye can be adjusted by loosening screw **(C)** and moving the eye as necessary.

If it is necessary to re-install the knife holder, use the following procedures:

1. Install a new knife on the knife pad. Using the adjusting screws **(B),** center the knife on the pad.

2. Install the knife pad on the knife holder.

3. Take a needle and cut to 1cm. Sharpen to a point. Insert the needle in the needle bar. Insert a piece of heavy wrapping paper under the clamps and lower the needle bar. Adjust the needle to allow for the needle to make a small hole in the paper. Run the machine to obtain an imprint of the shape of the buttonhole and the actual knife cut.

4. Check the position of the cut in relation to the needle holes. To center the cut, loosen screws **(D)** and **(E)** of the knife holder and reposition as necessary.

< The side screws **(B)** *should only be used for fine adjustments >*

Aligning the Cutting Lever

The position of the cutting lever has been pre-set at the factory and should not require adjustments. If the cutting lever has been re-installed, use the following procedure to align the cutting block. Refer to Fig 1 on P31.

1. Loosen screws **(F)**

2. By moving pins **(G)** the cutting lever can be moved from side to side.

3. Position the center of the cutting block over the cutting knife.

4. The pins should be firmly pushed against the cutting lever, and screws **(F)** tightened. There should be no side play in the cutting lever.

Clamp Height

To adjust the clearance between the clamp feet and the clamp mats, loosen nut **(A)** and turn screw **(B)** in for more clearance, and out for less clearance. See Fig 1.

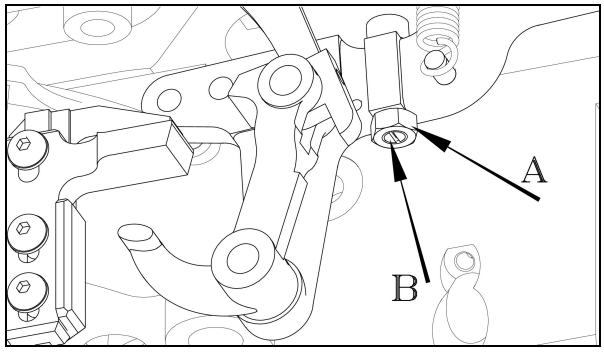


Fig 1

Clamp Pressure (Using Spring Washers)

The clamp pressure can be increased or decreased by changing the number of washers **(C)** in the clamp pull mechanism, as in Fig 2. Add washers to increase the clamp pressure

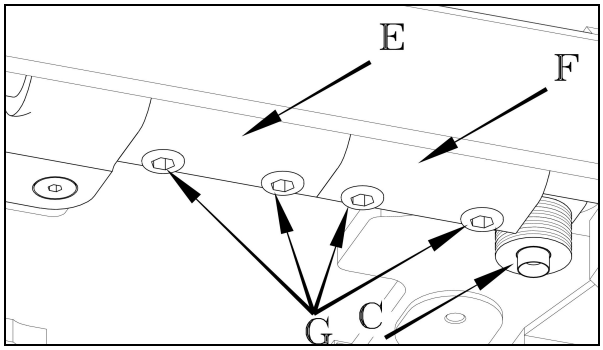


Fig 2

Clamp Pressure (Factory Adjustment)

The following adjustment is made at the factory. Care should be taken when making this adjustment since it also affects the clamp height.

This adjustment will have to be made for both clamps since they are independent of each other.

Manually pull down the clamps until the clamp feet just touch the clamp mats. The distance at point **(D)** should be 7mm, as shown in Fig 3.

Adjust blocks **(E)** & **(F)** as shown in Fig 2 by loosening screws **(G).**

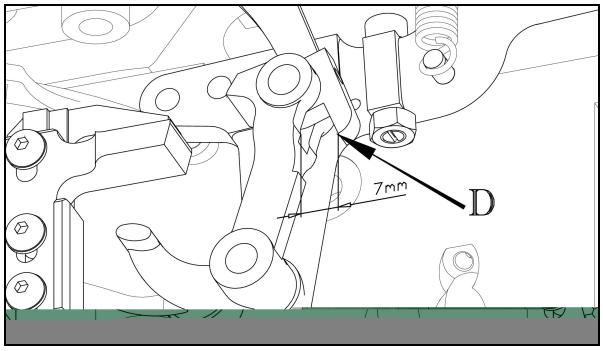


Fig 3

Clamping

The clamping finger **(A)** should pull the clamps all the way down during the clamping cycle. Loosen screws **(B)** and raise or lower the finger **(A)** in Fig 1. Turn the machine manually through a cycle to check the lowering of the clamps.

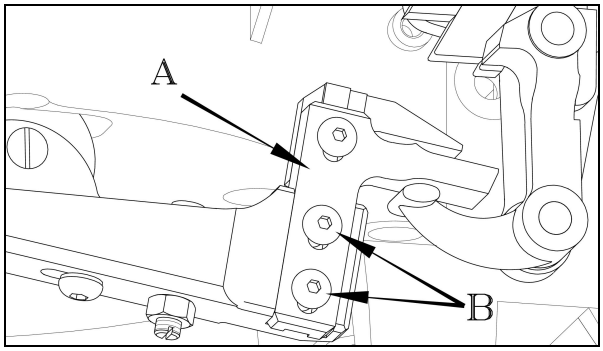


Fig 1

Unclamping

< Make the Clamping adjustment before making the Unclamping adjustment >

This adjustment is made with the machine in the cut after mode. See P8 to change the mode.

As the machine is coming to the home position, finger **(A)** should go under the wedge **(C)** by 0.5mm. Adjust bumper **(D)** to set the clearance.

Just before the machine comes to the home position, the clamps should raise. In Fig 2, loosen screws **(E)** and move the toggle arm **(F)** forward to raise the clamps early. Move the arm back for the clamps to raise late.

*< If the toggle arm **(F)** is moved forward too far, it will affect the clamping in the cut before mode, causing the clamps to drop, then raise, and then drop again. If this happens, move the toggle arm (F) to the back position by approximately 1.0mm)*

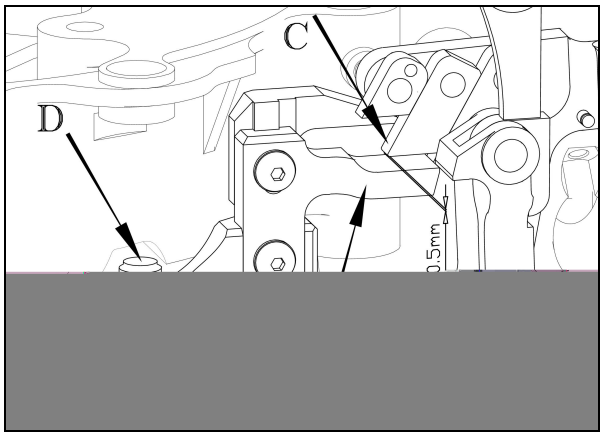


Fig 2

Unclamping Safety

This adjustment can be made with the machine sitting in the home position.

The distance at point **(F)** between the pin **(G)** and finger **(H)** should be 1.0mm. Loosen screw **(J)** and adjust as necessary.

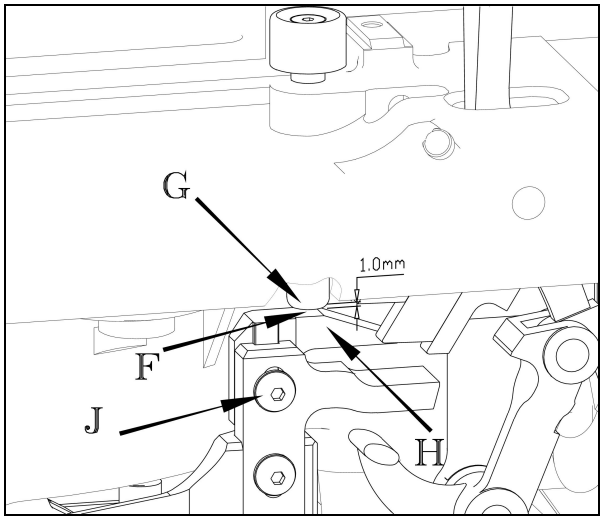


Fig 3

Clamp Spreading

The amount of clamp spread varies with the fabric being sewn. Thicker fabrics require more spread, and thinner fabrics require less spread. The spreading of the fabric is influenced by :

(1) The **parallel spreading** of the clamps in relation to the bedplate.

(2) The **equal spreading** of the clamps; i.e., each clamp spreads to the same limit.

(3) Both clamps **spreading the same amount**

Parallel Spreading

1. ⚠ Turn off the motor. Turn the machine to the home position.
2. Loosen the screw on stop **(A).**
3. Loosen screw **(B).**
4. Push the clamp plate against the side of the bedplate.
5. Be sure the collar on screw **(B)** is touching the clamp plate, and tighten screw **(B).**
6. Make the same adjustment on both clamps.
7. Tighten the screw on stop (A).

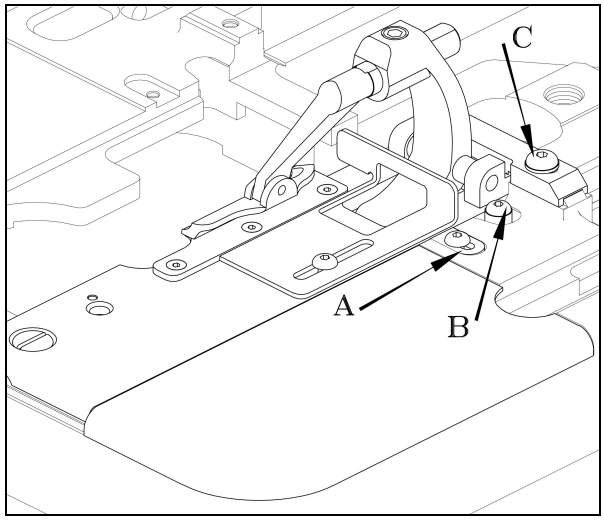


Fig 1

The following adjustments are extremely critical when running the machine in the cut before mode. The spreading has to be set correct or it may cause the following problems:

a) Uneven spreading can create distorted buttonholes.

b) Too much clamp spread will not allow enough stitch bite in the fabric, creating a very narrow stitch bite.

c) Too little clamp spread will not allow the stitch bite to cover up the cut edge, creating a buttonhole with loose threads in the middle.

Equal Spreading (Centralizing Clamp Plates)

Cycle the machine without sewing, and observe the spreading of the clamp plates. The left and right clamp plates should spread the same distance. Adjust the position of the stops **(A).** Moving the right stop inward will increase the spread of the left clamp plate, or moving the left stop inward will increase the spread of the right clamp plate. Adjust the stops until the left and right clamp plates are spreading the same distance.

Amount of Spread

1. ⚠ Turn off the motor, Turn the machine to the home position.
2. Loosen screw **(C)** on the clamp holdown/stop. Move inward for more clamp spread. Move outward for less clamp spread.
3. Turn the machine through a cycle and check the distance between the sides of each clamp plate and the stops **(A).** The distance should be the same for each clamp. Repeat adjustment 2 as necessary.

Clamp Mats

If the clamp mats have to be replaced, use the following procedures to install new mats.

1. Install the new mats on the clamp plates.

2. Refer to P35, and adjust the clamps for parallel and equal spreading.

3. ⚠ Turn off the motor. Manually turn the machine through the sewing cycle and check the clearance between the edge of the mat and the throat plate. The distance should be 0.5mm throughout the movement of the head, as in Fig 1. Remove the clamp plates and cut the mats with a file to obtain the clearance.

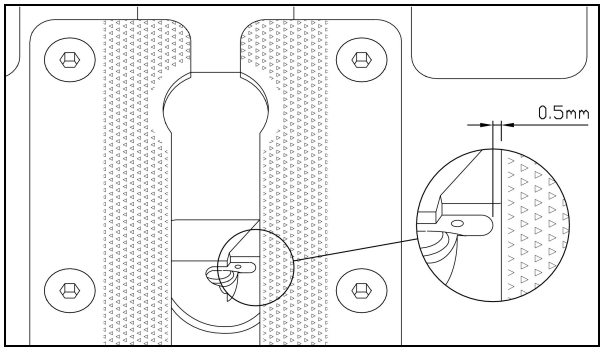


Fig 1

Clamp Feet

If the clamp feet have to be replaced, use the following procedures to install the new feet.

1. Refer to P35, and adjust the clamps for parallel and equal spreading.

2. Set the machine in the cut before mode.

3. ⚠ Turn off the motor. Unlock the machine and turn the needle bar to the outside stroke. Manually turn the machine through the sewing cycle and check the clearance between the needle and the clamp foot. The distance should be 1.0mm as in Fig 2. Loosen screw **(A)** and move the clamp arm / foot as necessary.

   It may be necessary to remove the clamps and cut the foot with a file in order to obtain the correct clearance around the eye.

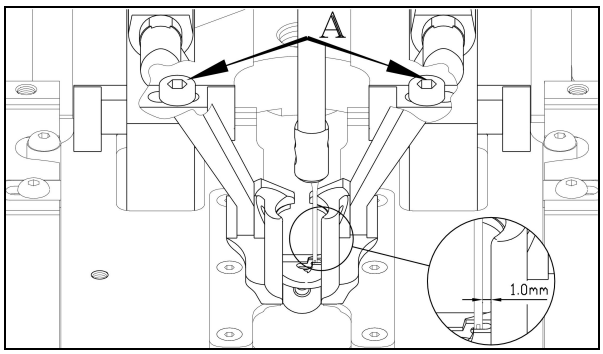


Fig 2

To obtain a better understanding of the shape of the eye, cut a needle to a length of 1cm. Sharpen the end of the needle to a fine point. Insert the needle in the needle bar. Remove the cutting block.

Insert a thick piece of wrapping paper under the clamps, and turn the needle bar to the full down position. Adjust the height of the needle until it just makes a small hole in the paper.

Lock up the machine. Turn on the motor. Insert the paper under the clamps and run the machine to obtain an outline of the shape of the buttonhole. Compare the shape of the eye against the samples in Fig 2

ADJUSTMENT OF THE EYE SHAPE

1. Raise the bedplate to check the link **(A)** in Fig 1. It should be in a horizontal position. If not, loosen screws **(B)** and adjust. The resulting eye shape should be as picture #1.

2. If the lever **(C)** moves too late, the eye shape will be like that as shown in picture #3. Loosen screw **(D)** and move the eye stud upward.

3. If the lever **(C)** moves too soon, the eye shape will be like that as shown in picture #2. Loosen screw **(D)** and move the eye stud downward.

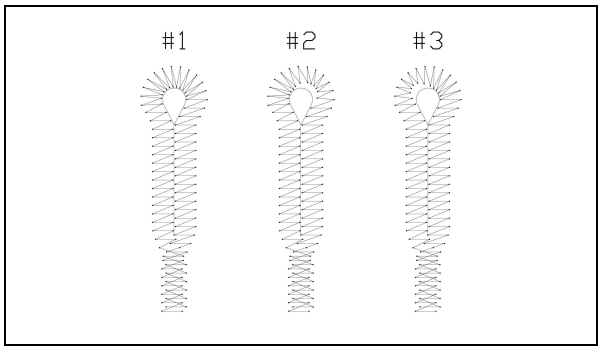


Fig 2

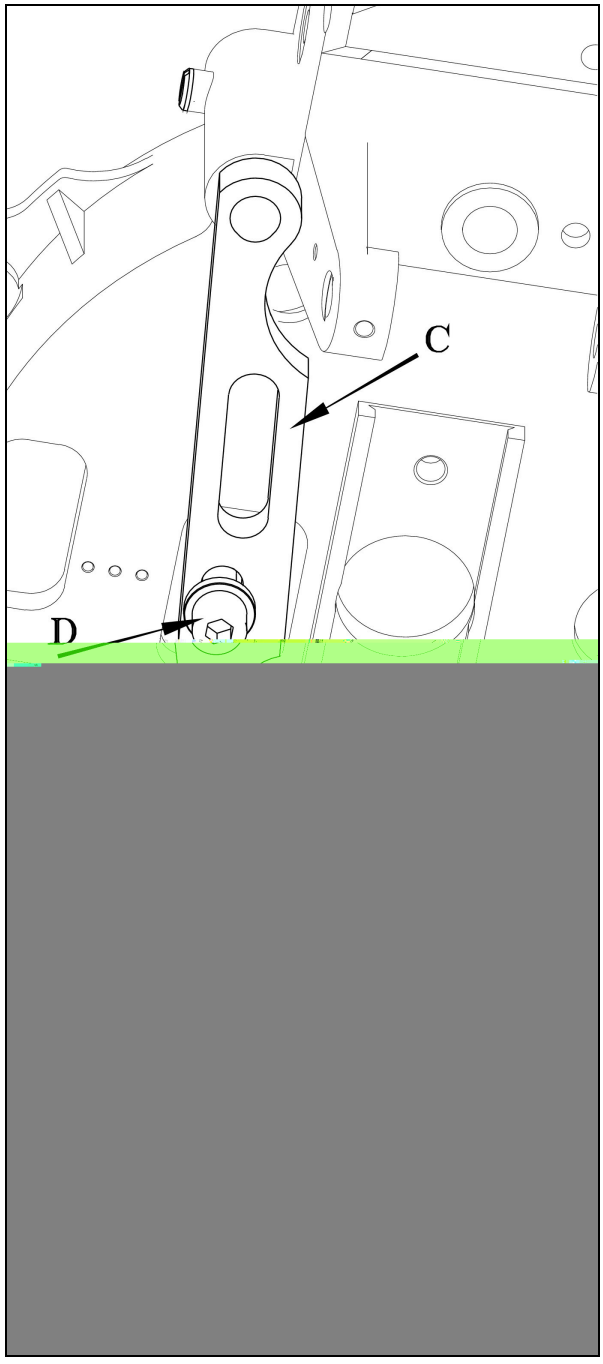


Fig 1

ALIGNMENT OF UPPER & LOWER RACES

LOWER RACE

The lower race must be square with the bedplate when stitching the first and second sides of the buttonhole as in Fig 1. Loosen screw **(A)** in Fig 4 and move the lower sector.

< When assembling the lower sector and the gear, make certain the sector teeth do not disengage at either end of the swing

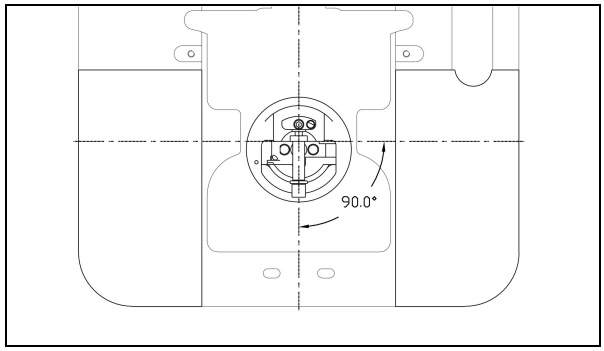


Fig 1

UPPER RACE

The upper race should be in perfect alignment with the lower race. Turn the machine to the home position, and tilt back the machine.

Make a visual sighting of the upper race in relation to the lower race. To adjust, loosen screws **(B)** in Fig 2, and turn the upper sector as necessary.

< When assembling the upper sector and the gear, make certain the sector teeth do not disengage at either end of the swing >

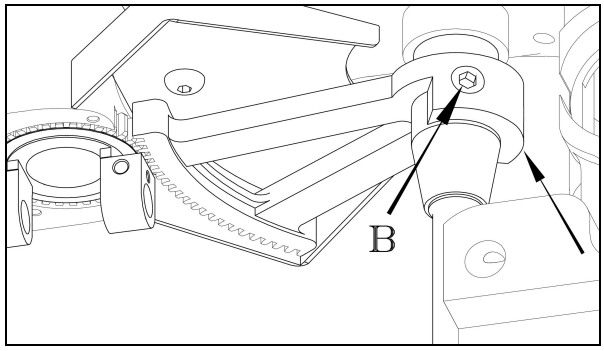


Fig 2

TURNING OF UPPER & LOWER RACES

1. When stitching around the eye, the upper and lower races must turn exactly 180 degrees. Loosen screw **(C)** and move forward for increased turning, and move back for less turning.

2. The race must begin turning at point **(D)** of the buttonhole, and must stop turning at point **(E),** as in Fig 3. Loosen screw **(F)** and move the stud forward to slow the turning, and move back to advance the turning.

< It will be necessary to re check all adjustments since one adjustment may affect others

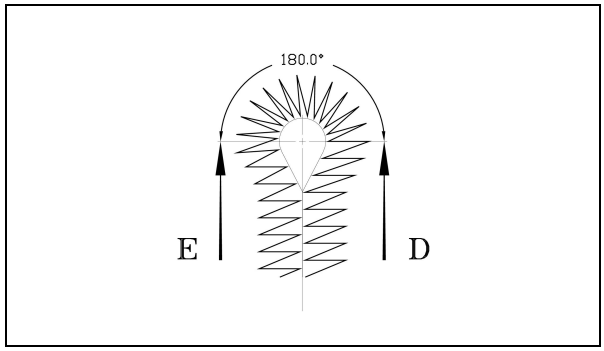


Fig 3

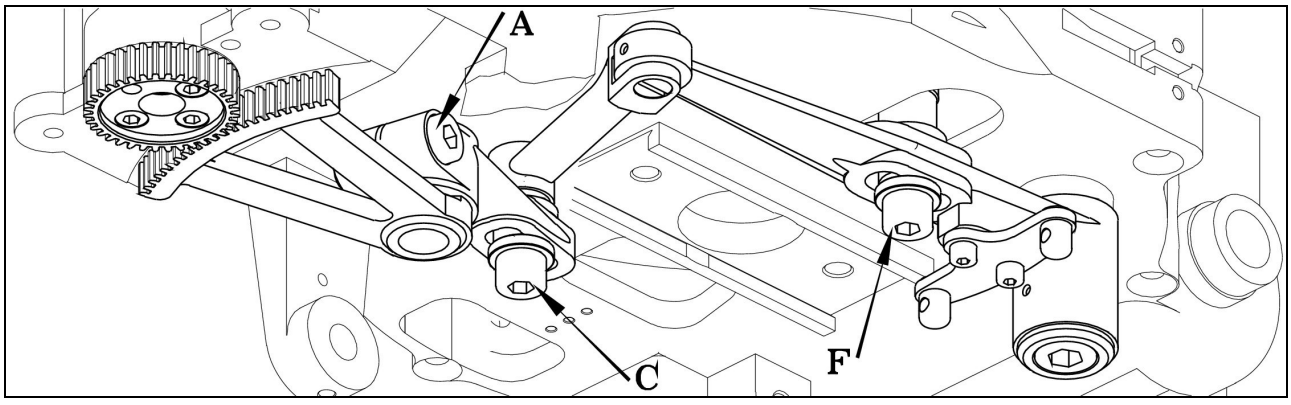


Fig 4

3. Install the four hold down fingers **(A)** and the bottom screws **(B),** Fig 1. The bottom screws should be tightened so that the fingers fit snugly against the hold down gibs, but they still should be able to rotate. DO NOT OVERTIGHTEN THE FINGERS OR THE MAIN CAM WILL BIND.

4. Install the set screws **(C)** in the top of the hold down fingers. Hold the bottom screw **(B)** while tightening the set screw **(C).**

5. Turn the cam completely through a cycle, checking that the cam turns free and there is no vertical movement during the turning of the cam.

6. Re-adjust the friction brake on the main cam. Turn the adjusting screw **(D)** until the brake just begins to apply pressure to the cam. (During the sew off of the machine, check the stitch density of the buttonhole by referring to P6)

7. Check the friction on the collar of the worm gear, as noted in Fig 3. The spring washers should be compressed slightly at 0.5mm by loosening screw **(E)** on adjusting collar **(F).** This adjustment eliminates any back spinning of the shaft during sewing.

   For easier adjustment, the collar can be adjusted through the opening in the back of the camcase.

   Do not apply excessive pressure to the spring washers or this will create a higher stitch density during the sewing cycle.

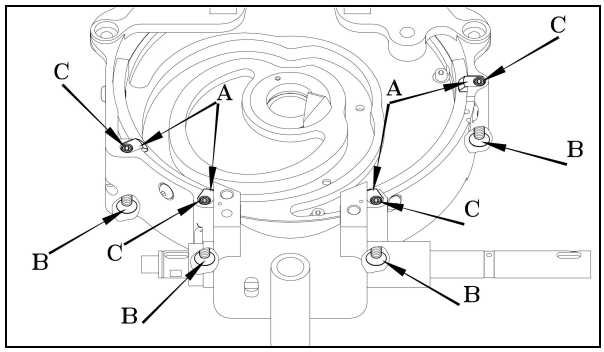


Fig 1

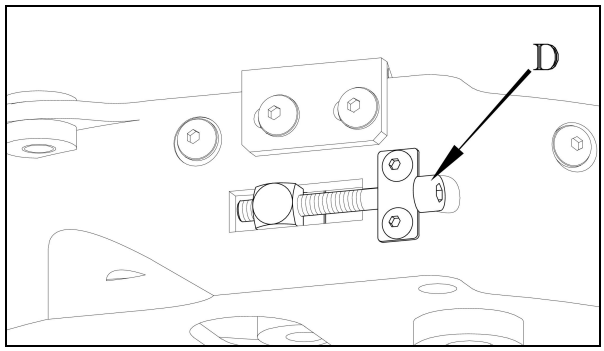


Fig 2

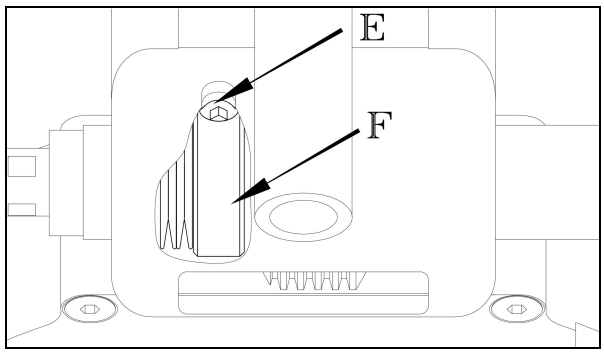


Fig 3

The following is the sequence of how the machine head is controlled and guided during the sewing of a cut after buttonhole.

1. The starting lever is depressed, and the machine head begins to travel towards the rear position. Immediately, pin **(A)** falls into the cam plate slot as per Fig 1.

2. This pin is now guiding the machine head while the stitching occurs on the first side of the buttonhole.

3. When the machine reaches the back position, it begins to produce the eye. At this point, pin **(A)** comes out of the cam slot, and the main cam now controls the movement of the machine head around the eye. NEITHER PIN SHOULD BE IN THE CAM SLOT DURING THE STITCHING AROUND THE EYE.

4. As soon as the eye is completed, the pin **(B)** falls into the cam slot, and the machine head is guided during the stitching of the second side of the buttonhole.

5. As the machine finishes sewing, the race turns, pin **(B)** comes out of the cam slot, and the machine is now in the home position.

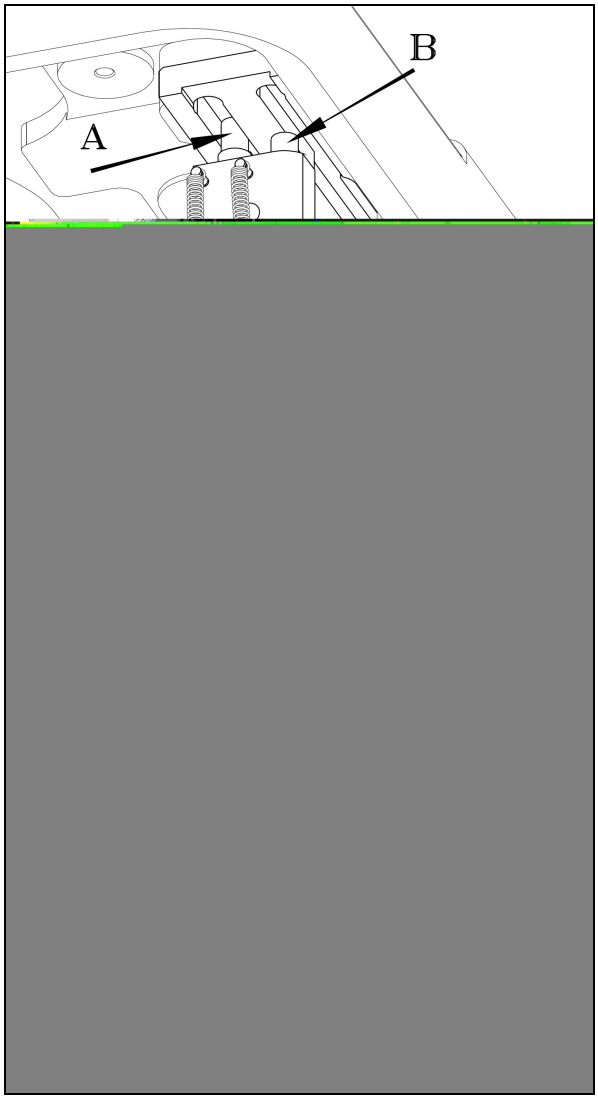


Fig 1

ADJUSTMENT OF FLYBAR PIN BRACKET

*< The adjustment of the flybar pin bracket (**C**) in Fig 1 is not a standard adjustment. It is preset at the factory. If the bracket is removed, reinstall as per the following adjustments >*

1. Set the machine to the no eye position, as shown on P5, Fig 3.
2. Turn the machine head until it travels to the eye position. The roller **(F)** in the bottom of the main cam should be in the position **(G)** as shown in Fig 2.
3. Loosen screw **(D)** to remove the pin **(E).**
4. Loosen screws **(A)** on the flybar pin bracket as shown in Fig1.
5. Position the bracket to allow pins **(B)** to enter freely into their respective slot of the flybar cam plate.
6. Tighten screws **(A)** on the flybar pin bracket.
7. Re-install pin **(E)** and tighten screw **(D)**.
8. Adjust the upper lateral lever as described on page 43.

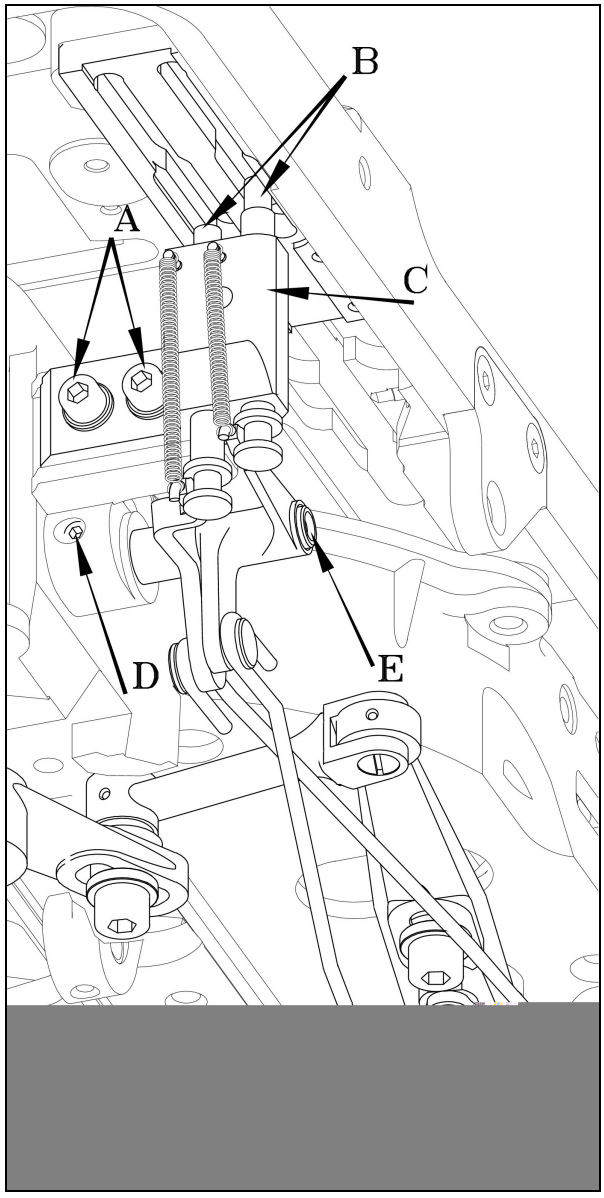


Fig 1

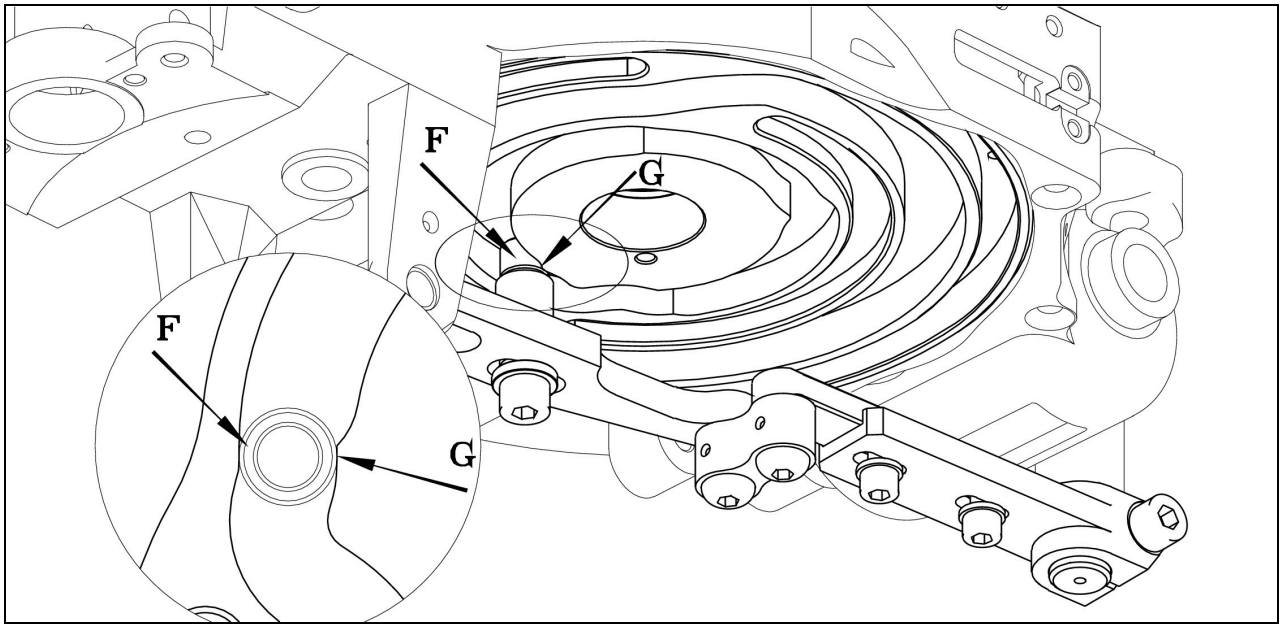


Fig 2

Centralizing the upper Lateral Lever

< The adjustment of the flybar pin bracket on page 42 must be made before the adjustment of the upper lateral lever>

1. Follow steps 1 & 2 on page 42 to turn the machine to the no eye position and verify the roller **(F)** is at position **(G)** on the main cam.

2. Loosen screw **(A)** in Fig 1.

3. In Fig 1, rotate the eye selector **(B)** several times from eye to no eye position. This will centralize the upper lateral lever with the guide plate **(C)**.

4. Tighten screw **(A)**.

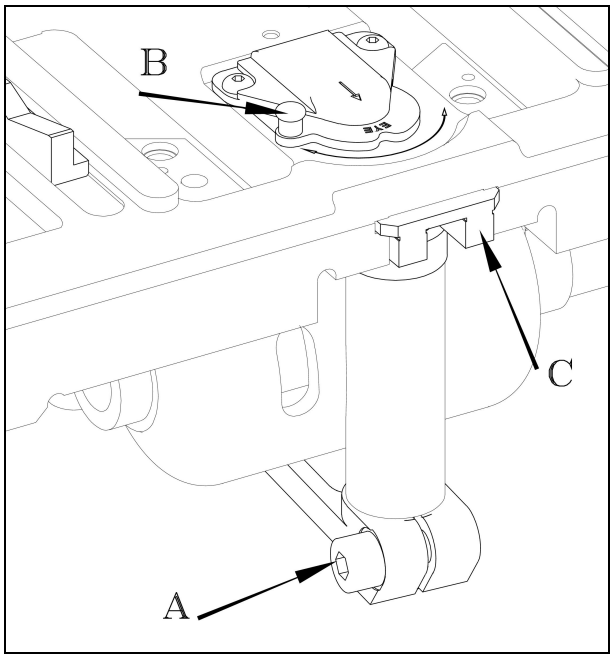


Fig 1

REMOVAL OF HEAD CAM

1. Remove the needle and needle bar screw. Remove the needle bar thread tension **(A)** in Fig 1. Loosen screws **(B)** and remove bearings **(C).**

2. Loosen screws **(D)** in Fig 2. Carefully pull the needle bar out of the head.

3. In Fig 3, remove the belt from the main drive pulley. Remove screw **(E)** on the clutch assembly. Remove the pulley **(F)** and the belt.

4. In Fig 4, remove the cork clutch **(G)** and bearing **(H).**

5. In Fig 5, remove the plate **(J),** the spring, and the pin. Hold the stop bolt in the back position for easier removal of the plate **(J).** (See page 9, Fig 1 for picture of stop bolt)

   Remove screw **(K)** and take off the metal gear.

6. In Fig 3, loosen screw **(L)** inside the hand wheel. Pull off the nylon gear & handle.

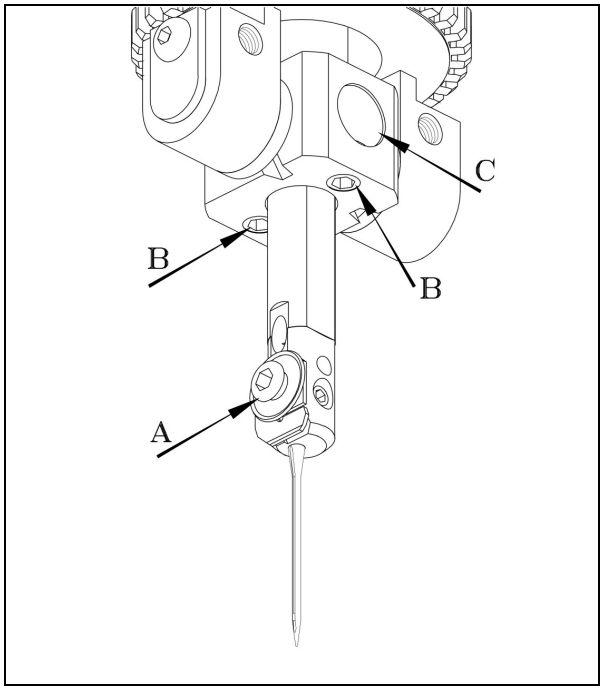


Fig 1

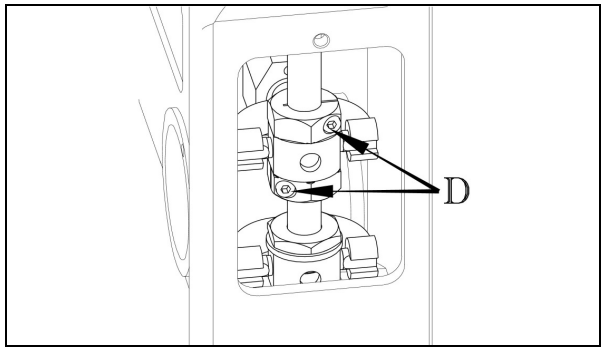


Fig 2

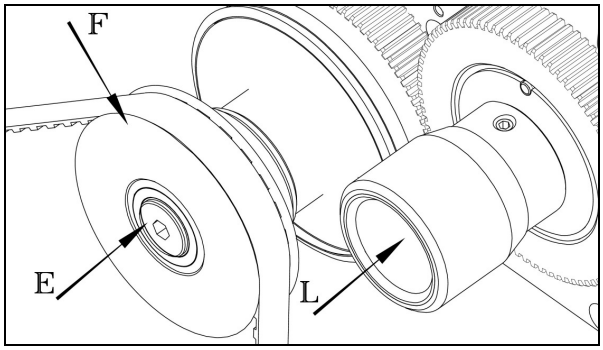


Fig 3

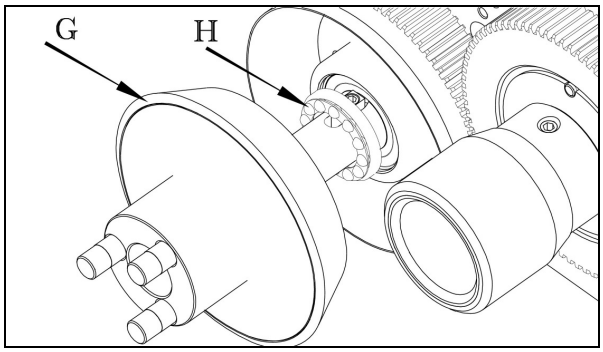


Fig 4

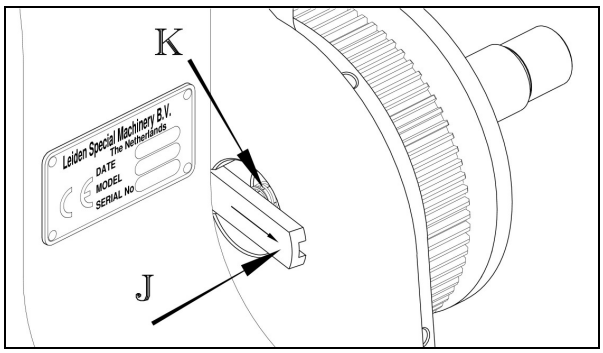


Fig 5

7. Remove the stop bolt assembly by loosening screws **(A)** Fig 1.

8. To remove the side plate **(B)** in Fig 2, first turn the machine to the eye position. Then remove the CB/CA selector (refer to P8, Fig 2). *Be careful the CB/CA selector shaft does not fall in the main cam.* Remove the seven screws **(C)** and remove the head plate. *Replace the CB/CA selector*

9. Remove the stitch bite lever by removing screws **(D)** in Fig 2.

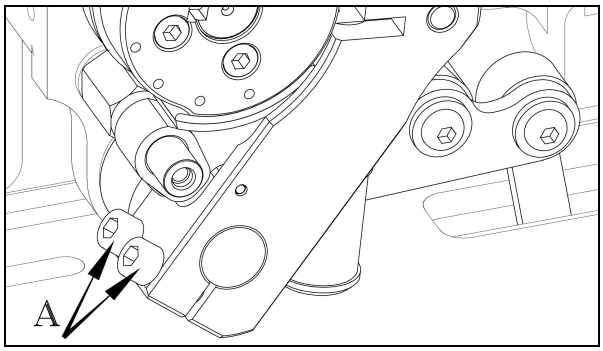


Fig 1

Fig 2

10. Remove screws **(A)** in Fig 1 and remove the stitch bite cam.

11. Remove the head cover **(B)** in Fig 2, and the tension release pin **(C)** under the head cover. Remove the oil manifold **(D)**

12. Disconnect and remove spreader wire **(E),** Fig 3.

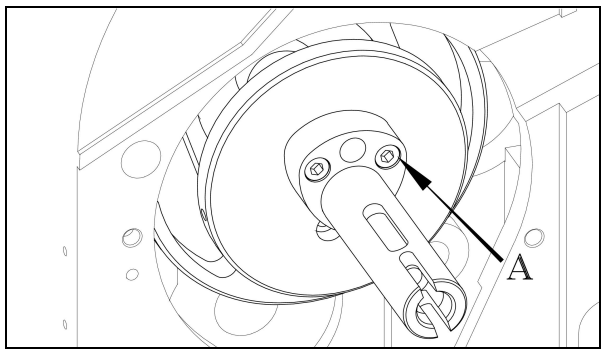


Fig 1

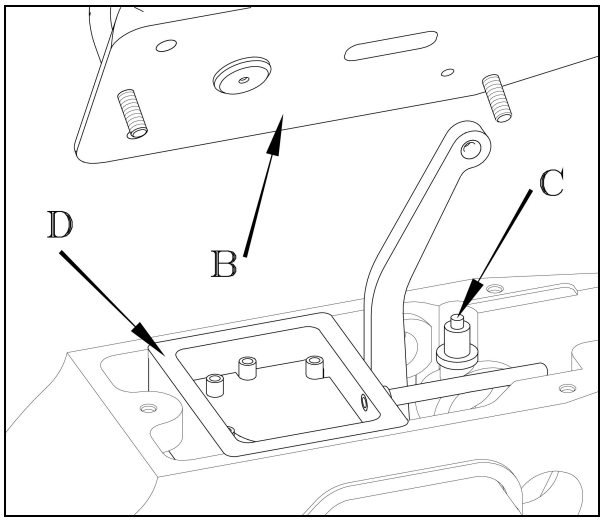


Fig 2

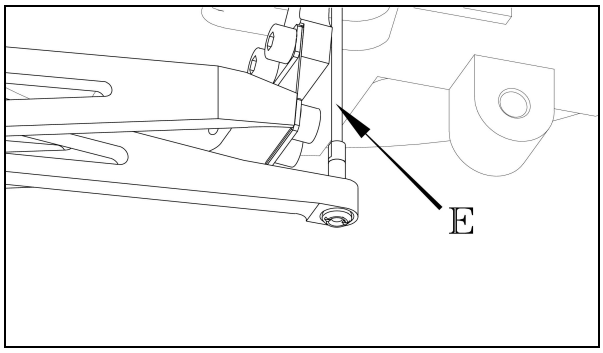


Fig 3

13. Referring to Fig 1, remove screw **(A)** and remove the shaft **(B)** in the stitch lever **(C).** Be careful not to let the spacers **(D)** fall in the main cam. Do not let the roller fall off the end of the stitch lever.

    By removing the shaft, it will allow easier access to the set screw **(E)** in Fig 2.

14. Loosen set screw **(E)** in Fig 2, and then remove screws **(F).** Then remove the take up cam **(G)** and the roller.

15. Referring to Fig 1, remove the stitch lever **(C).**

16. Remove the spring **(H)** in Fig 3 on the cutting lever. Remove screws **(K),** and loosen screws **(L).** Remove the shaft **(M)** from the cutting lever.

    The cutting lever has to be moved to the side to remove the stitch take up lever in the next step.

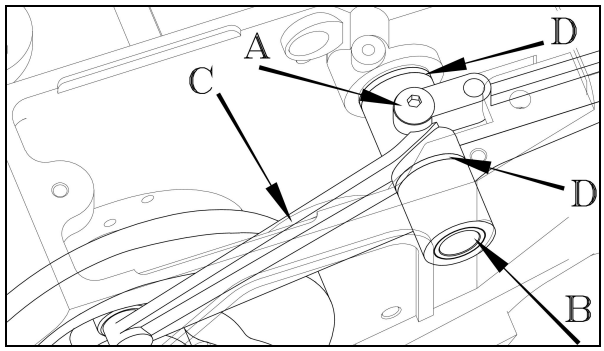


Fig 1

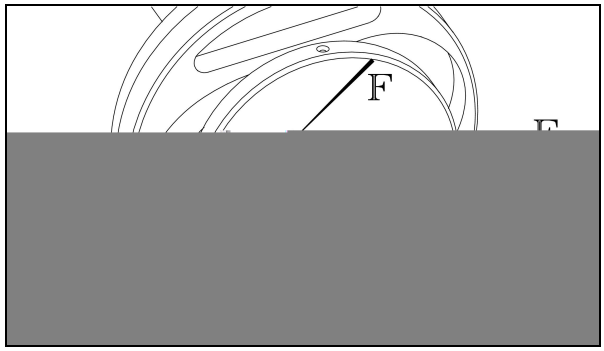


Fig 2

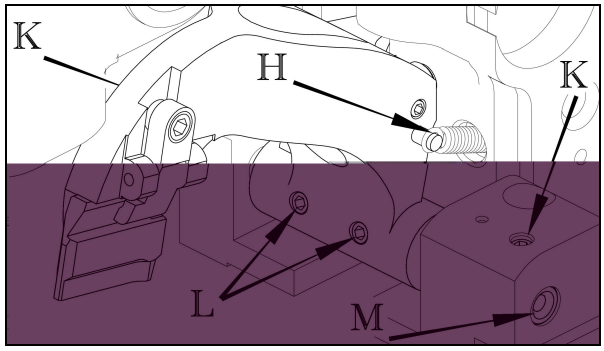


Fig 3

17. Remove screw **(A),** and remove the take up lever **(B)** in Fig 1.

18. Remove the set screw **(C)** and remove the stop wheel **(D)** in Fig 2.

19. Remove the head cam & shaft.

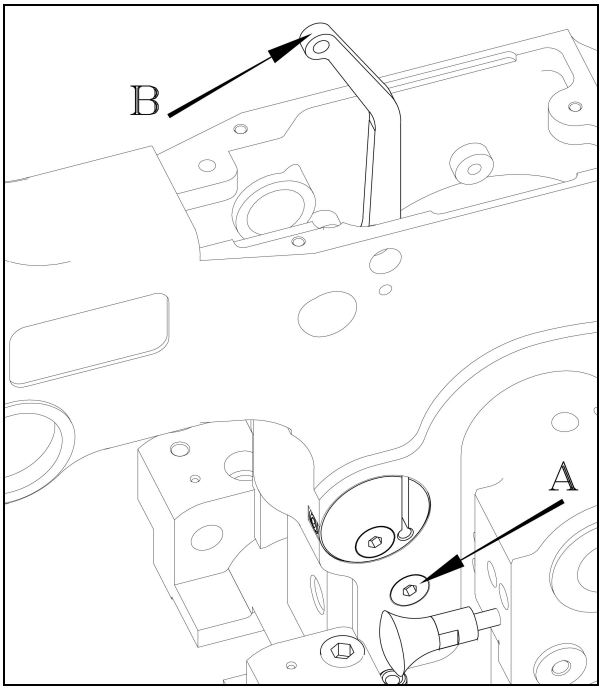


Fig 1

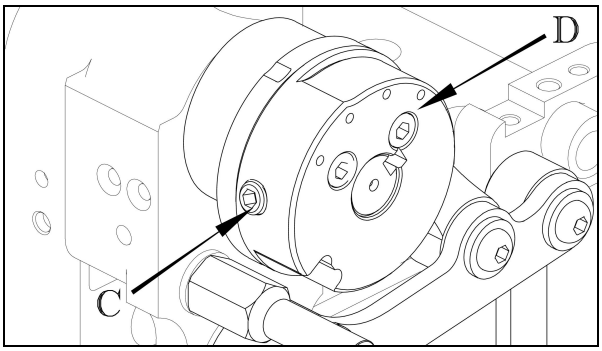


Fig 2

The alignment plate **(A)** as shown in Fig 1 has been pre-set at the factory, and does not require adjustments.

The plate allows the clutch assembly to be easily re-installed and positioned for correct clearance between the teeth of the metal gear and the nylon gear, and for correct belt tension.

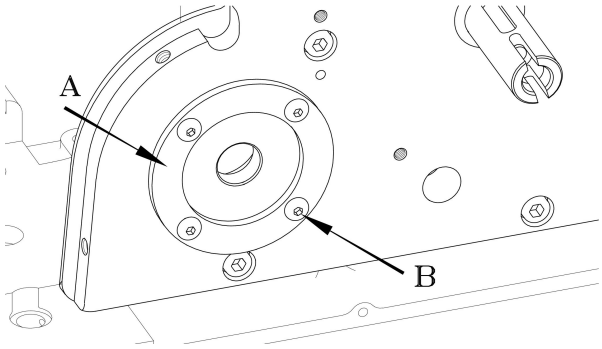


Fig 1

If the alignment plate has been removed, then re-install per the following adjustments:

1. Install the alignment plate **(A)** and screws **(B).** Do not tighten the screws.

2. Install the nylon gear **(C).** There should be 1.0mm clearance between the gear and the side plate. Tighten screw **(D).**

3. Install the metal gear **(E).** Do not tighten the screw **(F).**

4. Install the pulley **(G)** and belt. Now align the teeth of the metal pulley with the teeth of the nylon gear. The teeth should fit firmly together, but not tight. At the same time adjust the belt tension by moving the metal gear. When the adjustments are correct, tighten screw **(F).**

5. Remove the pulley **(G)** and belt. Tighten screws **(B)** through the holes in the plate of the metal gear **(E).** Complete the remainder of the installation of the clutch assembly.

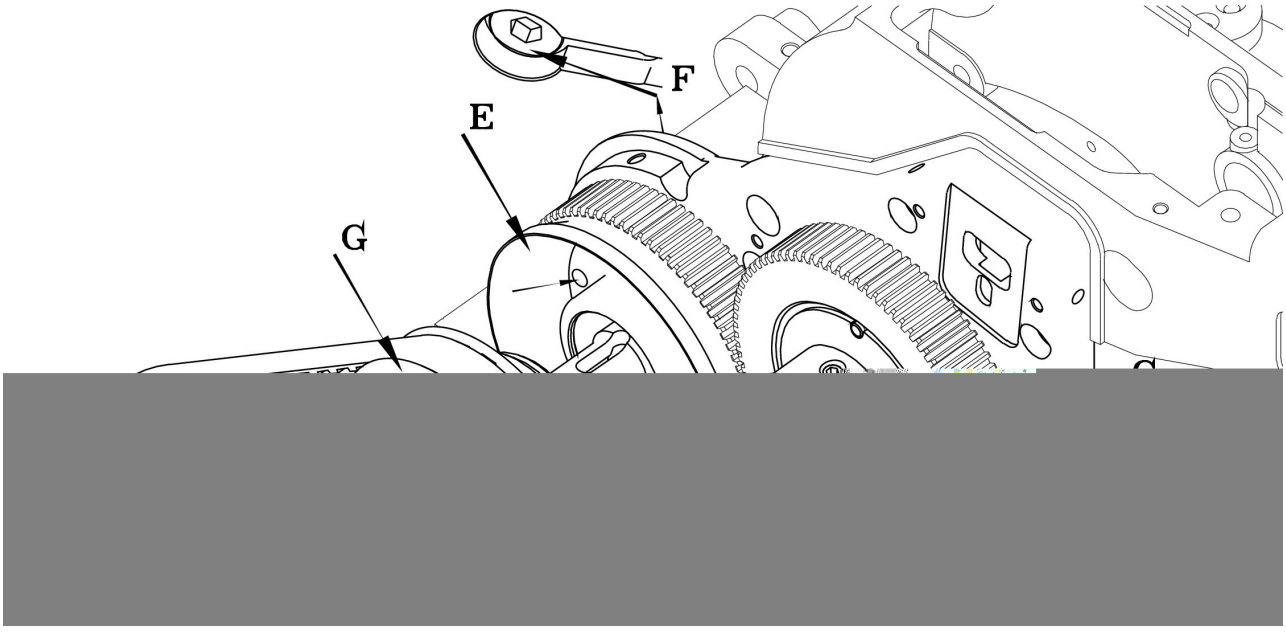


Fig 2

RE-INSTALL HEAD CAM

As shown on Pages 44-48, there are 19 steps to remove the head cam. To re-install, most of the steps are simply reversed. However, there are a few adjustments to make as the head cam is being installed. Use the following procedures.

1. Install the head cam and shaft in the sewing head.

2. The stop wheel **(A)** as noted in Fig 1 is installed next, and the side play in the head cam shaft is adjusted.

   Push the head cam shaft all the way to the right. At the same time push the stop wheel all the way to the left and tighten the set screw **(B).** Check for side movement in the head cam shaft. There should no side movement, but the head cam should turn freely. Re-adjust as necessary.

3. Install the take up lever **(C)** and screw **(D)** as in Fig 2.

4. Install the shaft **(E)** in the cutting lever as in Fig 3 and spring **(F).** Align the cutting lever (see P32).

5. Connect the spreader wire **(G)** in Fig 4. The adjustment will follow later.

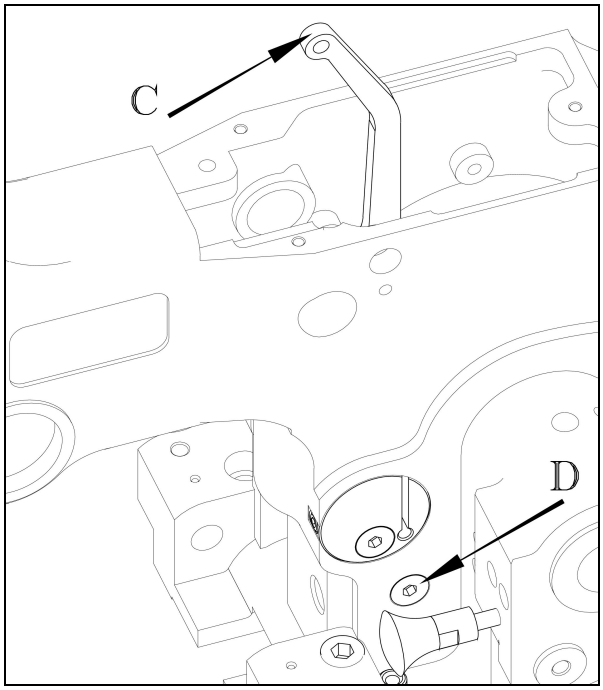


Fig 2

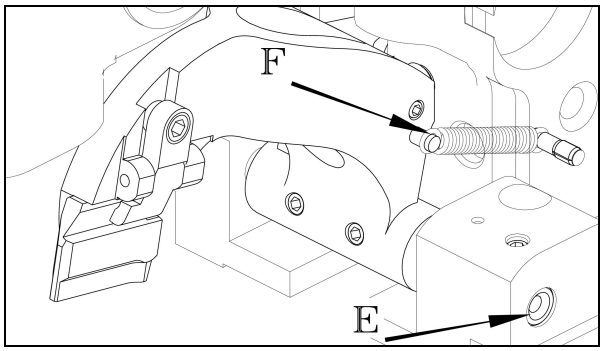


Fig 3

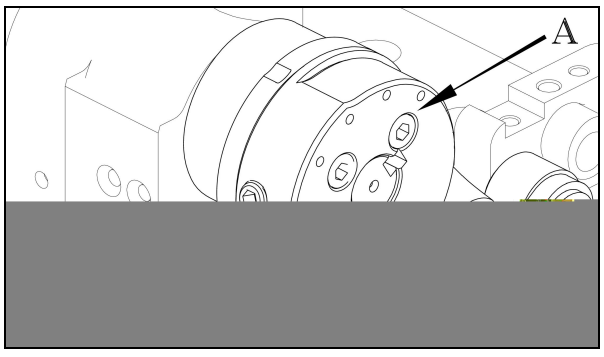


Fig 1

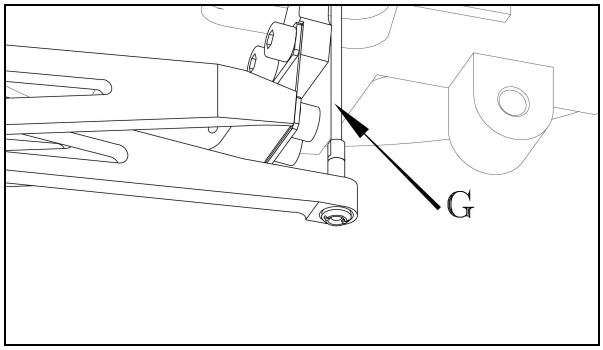


Fig 4

6. Install the stitch lever **(A)** in Fig 1, but do not install the shaft **(B)** until step 8.

7. Install the roller on the take up lever. Install the take up cam **(E)** in Fig 2, with the screws **(F).** Then install the set screw **(G).**

8. Install shaft **(B)** and spacers **(C)** in Fig 1. Note the slot on the shaft **(B).** It should be positioned above the tension release mechanism on the right side of the sewing head. Tighten screw **(D).**

9. Install the oil manifold **(H)** in Fig 3. Install the pin **(K).** Before installing the head cover **(L),** inspect the tension release mechanism to insure it's working properly. See P14 to adjust if necessary.

10. Install the stitch bite cam and tighten with screws **(M).**

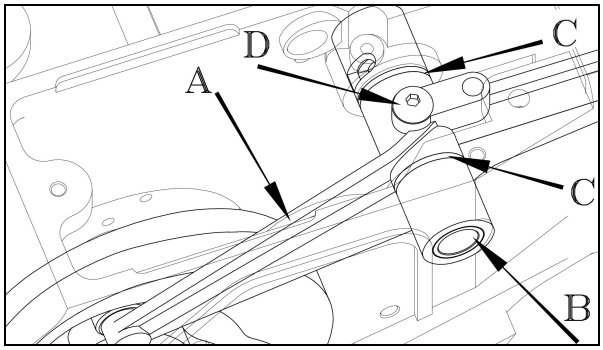


Fig 1

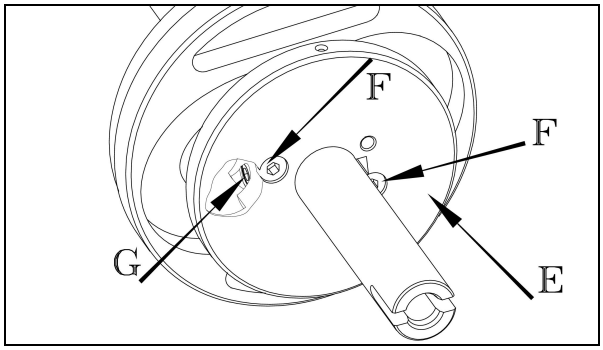


Fig 2

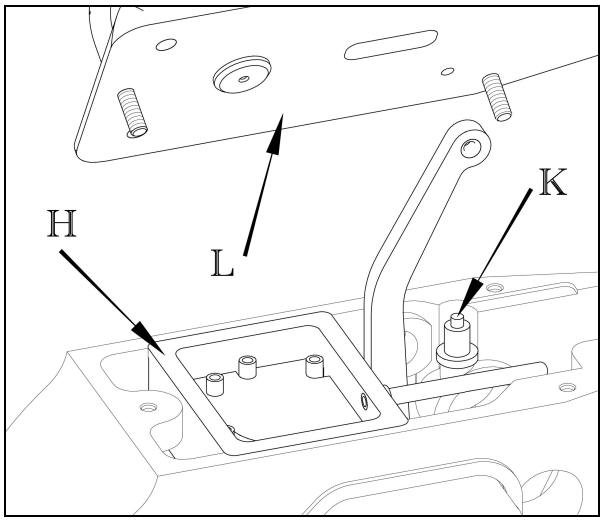


Fig 3

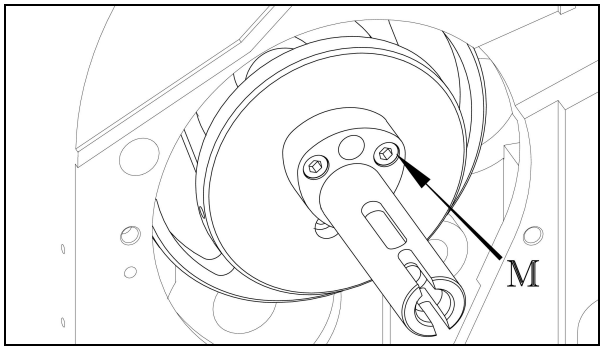


Fig 4

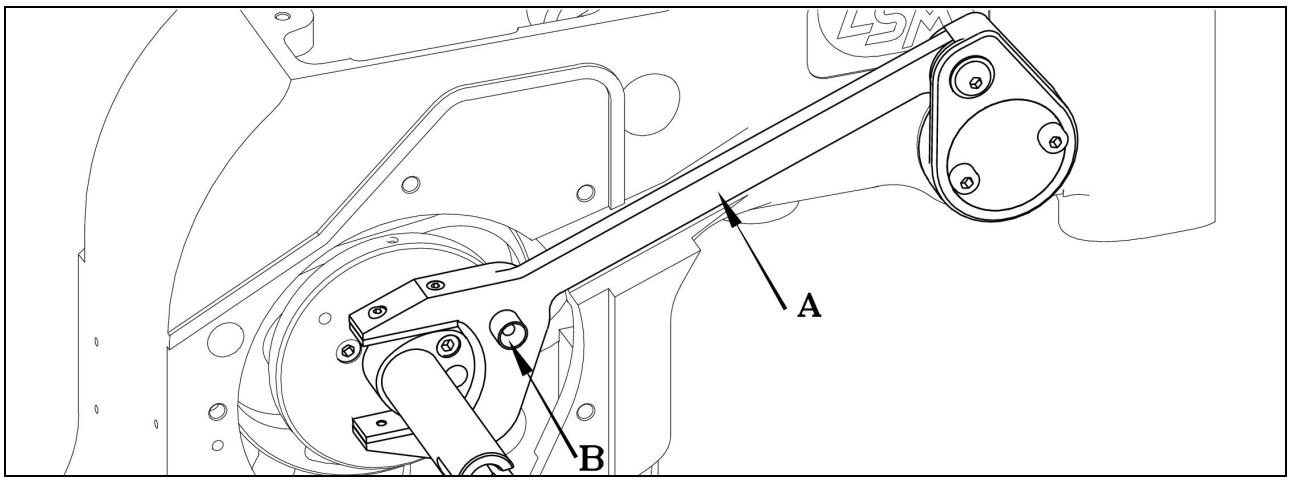


Fig 1

11. Install the stitch bite lever **(A)** in Fig 1. The adjustment will be made later. Do not tighten screws.

12. Install the side plate **(C)** in Fig 2. Check the locating pins in the side plate to insure they are correctly installed in the machine head.

    Be sure pin **(B)** is installed correctly in the slide block on the head plate.

13. Install the nylon gear **(D).** There should be 1.0mm clearance between the gear and the side plate.

14. Install the metal gear **(E).**

15. Refer to Fig 3. Install the pin **(F),** the spring, & the plate **(G).** For easier installation, hold the stop bolt in the back position (see page 9, Fig 1 for picture of the stop bolt).

    Be sure the pin **(F)** is in the center of the slot of the plate **(G),** and the spring is seated correctly.

16. Install the guide **(H)**, bearing **(J)**, & clutch cone **(K)** in Fig 4. Be sure the pins 111-124-000 in the clutch cone **(K)** fit in the holes located in the pulley **(L).**

17. Install the pulley **(L)** and belt.

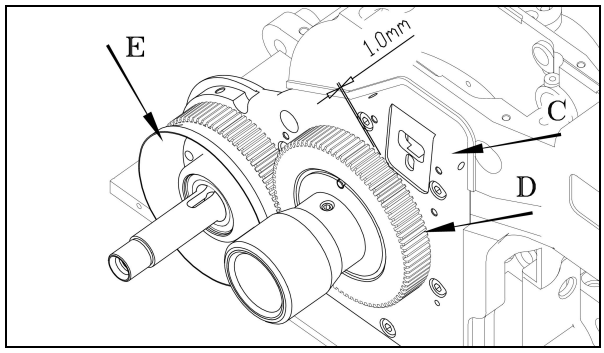


Fig 2

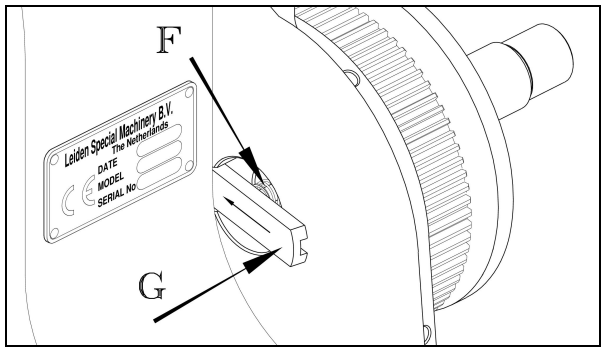


Fig 3

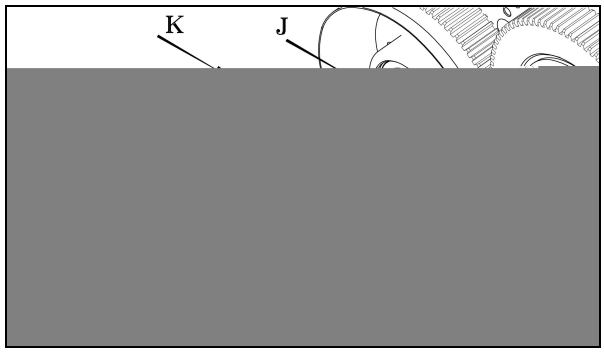


Fig 4

18. Turn the machine to the home position. install the stop bolt assembly **(A).** Pull the stop bolt tight against the stop wheel, and lock up the machine. Continue holding the stop bolt tightly against the stop wheel and tighten screws **(B)** in Fig 1.

19. Install the needle bar and other items as shown in Fig 2.

20. Adjust the cutting space for cut before mode, needle bar height, & spreaders as described on Pages 19, 25, & 26.

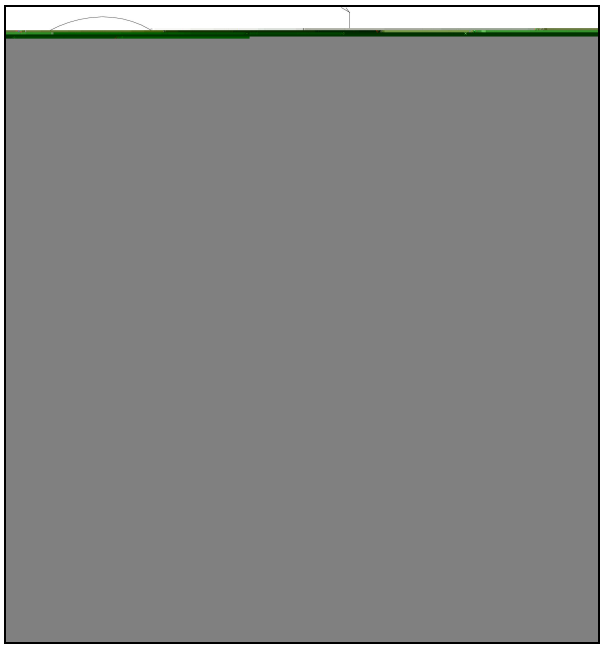


Fig 1

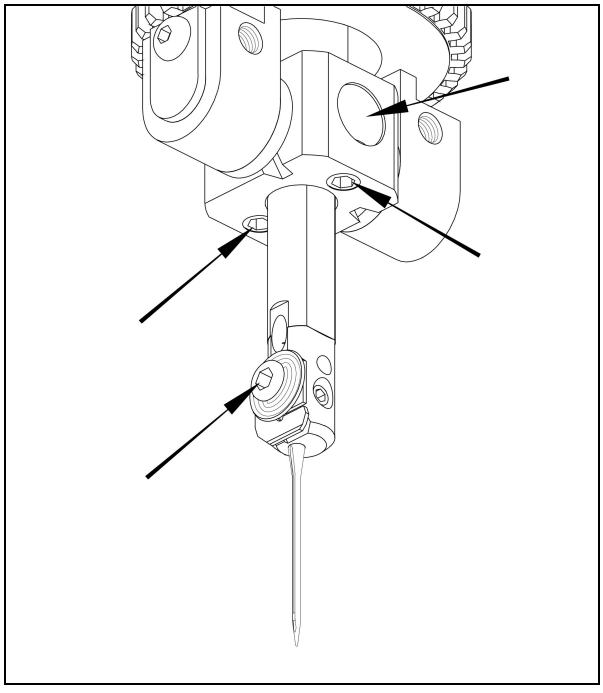


Fig 2

There are three adjustments in the clutch mechanism: (1) the timing of the clutch engagement (2) the adjustment of the amount of clutch friction (3) the adjustment of the clutch slippage.

> ⚠ Remove V-Belt & Head-Belt before adiustment..

1. Adjustment of the Timing of the Disengagement of the Clutch

For simplicity, this adjustment is made with the machine in the home position.

This adjustment is made in relation to the movement of the stop bolt to the disengagement of the clutch mechanism.

a. Unlock the machine by pushing the stop bolt to the back position. Turn the hand wheel until the stop bolt is touching the stop wheel as shown in Fig 1. Because of the brake pressure being applied to the stop wheel, you may have to manually pull the stop bolt inwards for it to touch the stop wheel.

   Just as the stop bolt falls into the stop wheel (as shown in Fig 1), the clutch should disengage.

   Watch the movement of the actuator (**A**) as shown in Fig 2. Just as the stop bolt touches the stop wheel in Fig 1, the actuator should have moved all the way inward. There should be no further movement as you continue turning the handwheel to lock up the machine. This means the clutch has fully disengaged.

b. To adjust the timing, the eccentric (**B**) in Fig 3 is used. Loosen screw (**C**) to adjust the eccentric. As a preliminary adjustment, the hole (**D**) should be set parallel with the bedplate.

   Unlock the machine again and turn the handwheel to lock up the machine. Watch the movement of the actuator (**A**) in relation to the stop bolt touching the stop wheel as shown in Fig 1. Lock up the machine. If the actuator (**A**) moves further inward, then adjust the eccentric (**B**) upwards to advance the timing.

   If the clutch disengages before the machine has locked up, then the actuator has moved inward too fast. Turn the eccentric downwards to retard the timing.

Re-check the movements of the stop bolt and the actuator. The final adjustment should show the stop bolt falling into the recess, and at the same time, the actuator moving all the way inwards to disengage the clutch.

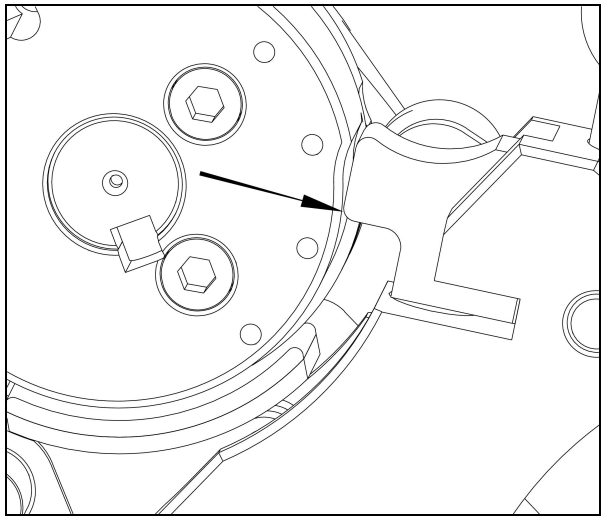


Fig 1

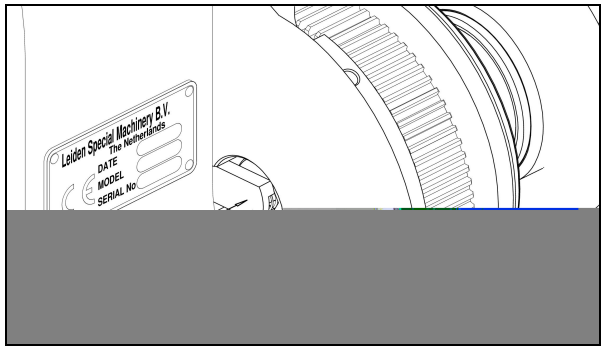


Fig 2

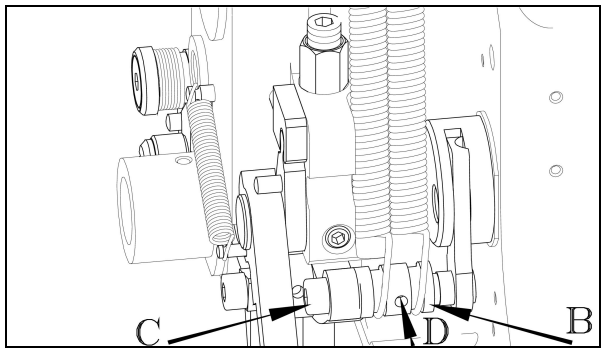


Fig 3

2. Adjustment of the Engagement of the Clutch

The following adjustment is made such that the clutch engages just as the machine unlocks for sewing.

a. Turn the machine to the home position and lock the machine.

b. Turn the machine using the drive wheel until it just unlocks for sewing. Insert a wrench into hole **(A)** in Fig 1 to reach the adjusting screw. Turn the screw inwards to release all of the clutch friction.

c. Slowly turn the screw outwards untill the clutch friction is firmly engaged.

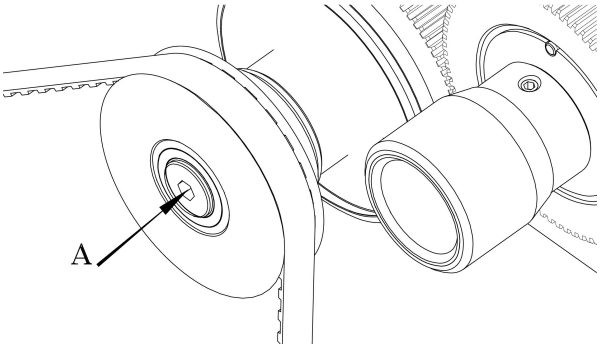


Fig 1

3. Adjustment of the Clutch Slippage

The nylon gear **(A)** in Fig 1 is designed to slip when the machine stops sewing. This is to prevent damage to the teeth of the nylon gear which contact the teeth of the metal gear.

To test the slippage, use a black pen and mark one of the teeth on the nylon gear, and make a corresponding mark on the plate, as shown in Fig 1.

Run the machine one time, and check the alignment of the two marks. The mark on the nylon gear should go beyond the mark on the plate by 4-8 teeth.

To adjust, loosen screws **(B).** Turn the hand wheel **(C)** inward to increase the friction on the nylon gear. This will cause less slippage.

Turn the hand wheel outward to decrease the friction on the nylon gear. This will cause more slippage.

Be sure the screws **(B)** *are very tight when the adjustment is completed.*

Replace the covers once the adjustments are completed, and before running the machine.

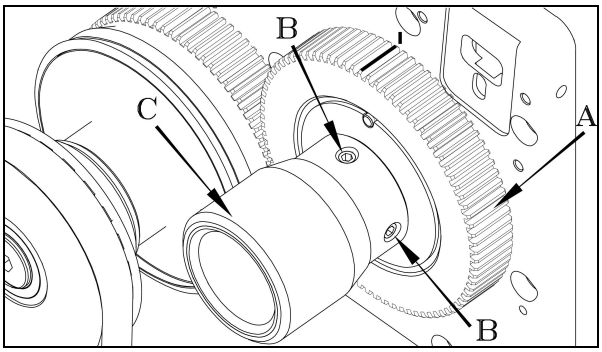


Fig 1

Before disassembling the machine, first install the shipping bracket to the base and bedplate as shown in Fig 4. Then remove the machine and base from the table.

1. Remove the needle from the needle bar.
2. Loosen screws **(A)** on the upper sector lever , Fig 1.
3. Remove the stitch regulator link **(C),** Fig 2.
4. Disconnect and remove the spreader wire **(D),** Fig 3.
5. Disconnect the looper drive link by removing screws **(E)** in Fig 3.

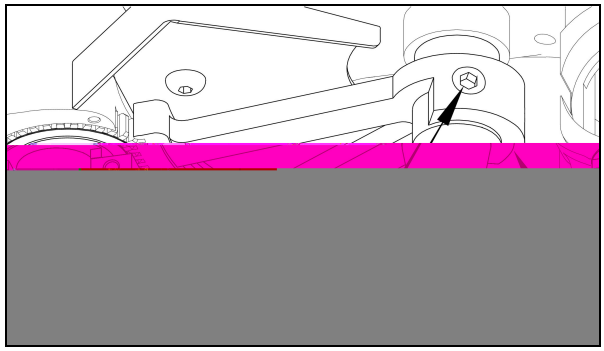


Fig 1

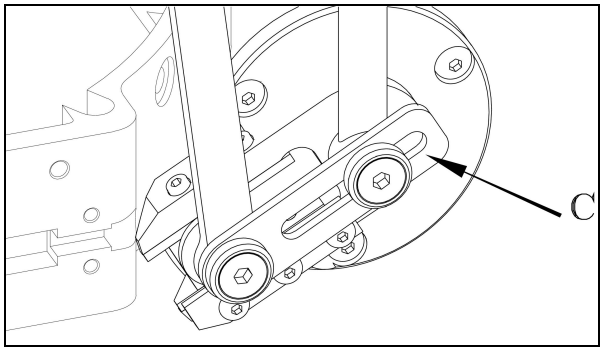


Fig 2

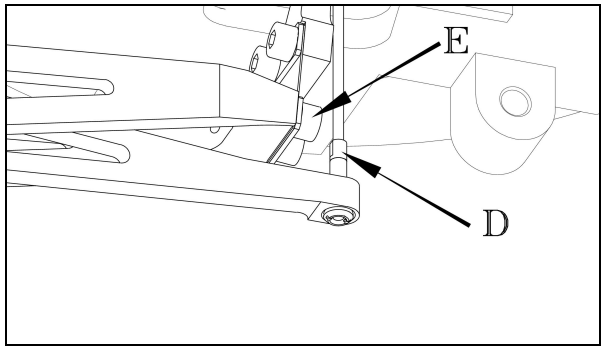


Fig 3

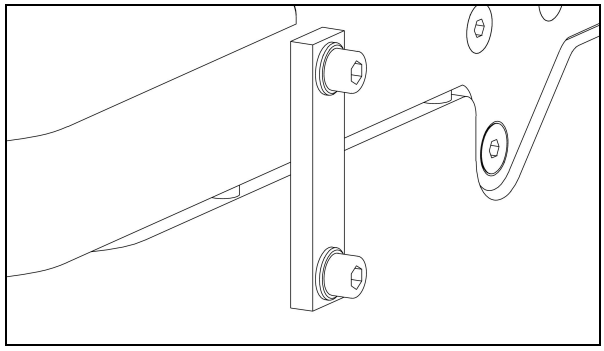


Fig 4

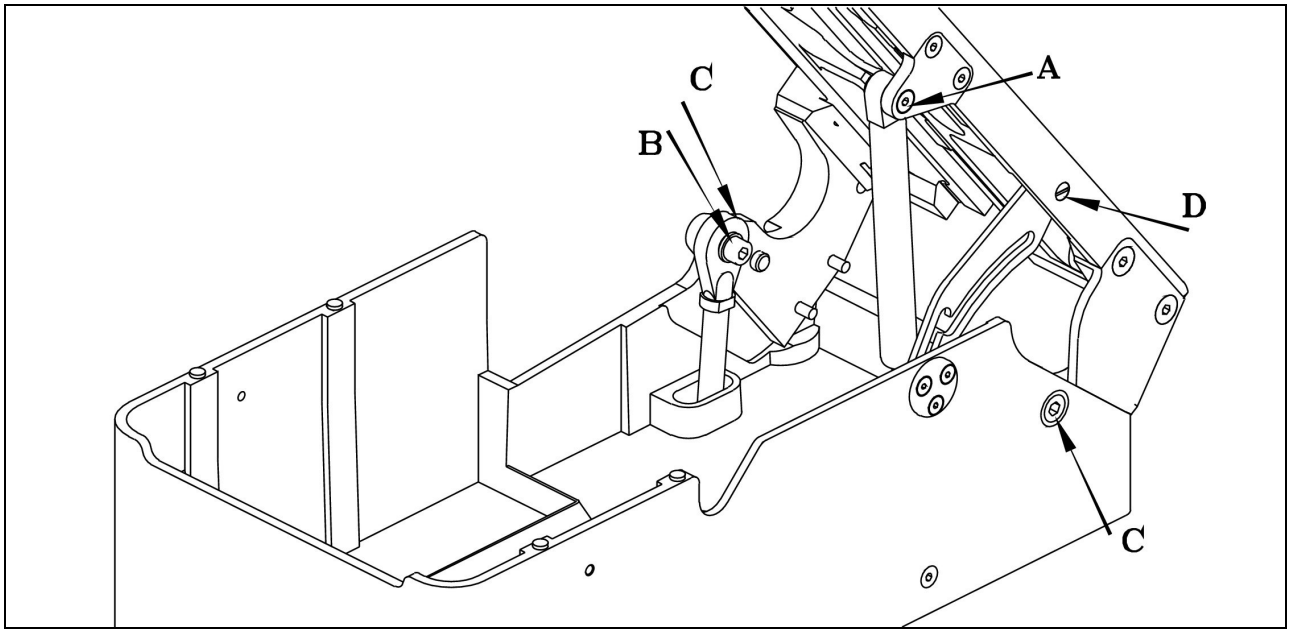


Fig 1

6. Remove screw **(A)** to take off the gas spring, Fig 1.

7. Remove the motor support rod **(B)** in Fig 1.

8. Remove both belts. See P44, item 3 for removal of the clutch assembly.

9. Remove the safety latch by removing screw **(D).**

10. Remove the hinge screws **(C)** holding the bedplate to the base.

11. Remove the head/bedplate/camcase from the machine base and place on a workbench. Use wooden blocks to support the machine, or damage could be done to the parts on the camcase.

    It is recommended to remove the spreader drive 113-066-020 & looper drive 113-067-020 on the bottom of the camcase to prevent any possible damage to these parts.

12. Remove the 4 head screws **(E),** and 2 head pins **(F)** in Fig 2. Remove the head.

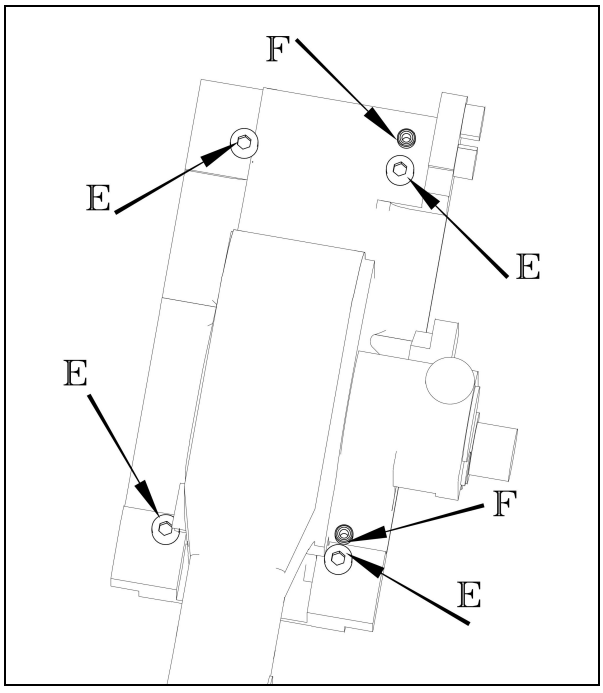


Fig 2

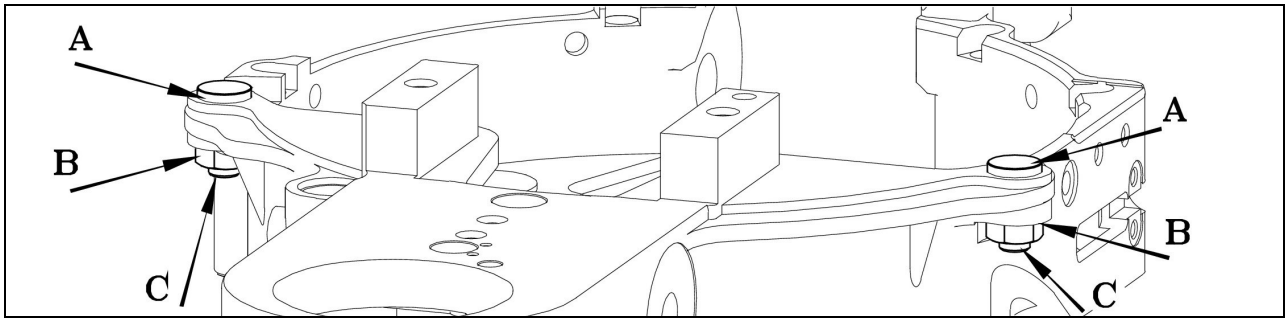


Fig 1

The head must move freely during the sewing cycle, without any binds or excessive movement between the castings.

The first set of adjustments affects the clearance between the head and bedplate. The second adjustment affects the clearance of only the bedplate.

1. There are two bedplate buttons **(A)** as shown in Fig 1. Loosen nut **(B)** and turn screw **(C)** until the buttons are firmly seated against the bedplate.

   Both screws should be turned in the same distance to insure the head is parallel with the bedplate.

   If the buttons are set too tight against the bedplate, a bind will be created, resulting in excessive stitch density during the sewing cycle.

In Fig 3 the support buttons **(F)** helps to balance the bedplate during the sewing cycle. Adjust as follows.

2. Remove the motor belt to reduce any pressure on the machine.

3. Roller **(D)** in Fig. 2 should not be touching the wedge **(E)**. Adjust as necessary.

4. Loosen screws **(G)** and push the support buttons upward to touch the bedplate.Tighten screws **(G)**.

5. Re-install the motor belt and re-adjust the roller **(D)** as described on page 7.

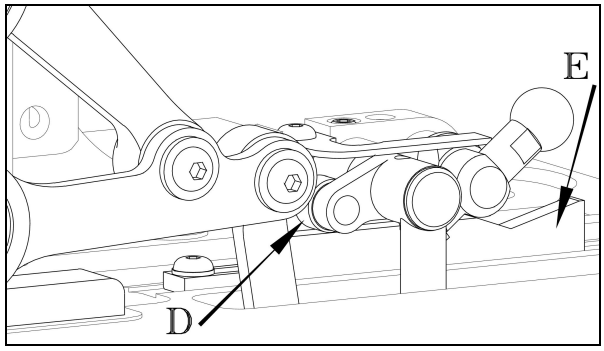


Fig 2

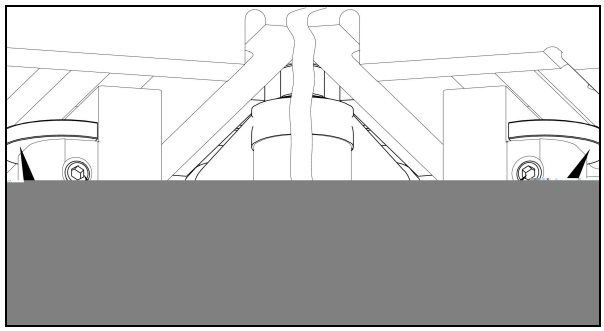


Fig 3

The troubleshooting section of the manual is divided into the sections as noted below. The following pages give examples of machine conditons, the possible cause, and the page number in the instruction manual for reference on the required adjustments.

The solutions normally refer to adjustments of particular parts; however, each part which is adjusted should also be inspected for wear or possible damage.

WARNING: BELTS GUARDS AND OTHER SAFETY DEVICES SHOULD BE RE-INSTALLED ON THE MACHINE AFTER SERVICING.

Start and Stop Motion Adjustments

Problem	Possible Cause	Page
1. Start lever is pressed, but machine head does not travel to back position.	1.Shifting lever 112-011-020 binding. 2. Motor belt loose or broken. 3. Spring 100-800-006 broken on shifting lever. 4. Movement of stop bolt 111-089-020 is restricted.	
2. Machine head goes back, but machine does not start sewing.	1. Driving collar 113-029-000 and driven collar 113-106-000 not set correctly. 2. Clutch engagement set incorrectly. 3. Not enough clutch friction	10 55 56
3. Start lever is depressed, and machine makes a complete cycle without sewing.	1. Spring 100-800-014 is broken. 2. Release rod 111-143-000 pulled out. 3. Stop plate 112-052-000 not set properly.	 10
4. Machine sews part of the buttonhole, stops sewing, and returns to home position.	1. Stop bolt catch 111-057-000 not set properly. 2. Pin 100-600-010 broken.	10
5. Machine comes to end of cycle, stops sewing, but doesn't return to home position.	1. Driving collar 113-029-000 & driven collar 113-106-000 not set correctly.	11
6. Machine comes to end of cycle and does not lock up automatically. You have to manually lock up the machine.	1. Safety stop 113-096-020 not set correctly. 2. Re-adjust stop ring 111-048-100. 3. Too much brake pressure.	13 12 13
7. Machine comes to end of cycle, but fails to lock up and makes 2-3 extra stitches.	1. Remove clutch cone assembly 111-125-020 and clean the cork surface and the surface of the flywheel gear 111-108-020. 2. Check for binds in the clutch mechanism. 3. Not enough clutch pressure. 4. Not enough clearance of roller 111-061-000 5. Springs 100-800-001 weak.	 55-56 56 9
8. "Clicking" sound heard when machine is in home position.	1. Driving collar 113-029-000 & driven collar 113-106-000 not set correctly.	11
9. Machine repeats cycle.	1. Driving collar 113-029-000 & driven collar 113-106-000 not set correctly. 2. Starting lever 112-064-000 binding or check spring 100-800-007 broken.	11

Start and Stop Motion Adjustments

Problem	Possible Cause	Page
10. Teeth of nylon gear 111-104-020 wearing or breaking.	1. Not enough clutch slippage. 2. Clutch does not disengage at th finish of sewing. Check clutch adjusments.	56 55-56
11. Clutch mechanism is making a noise at the beginning of the sewing cycle.	1. Remove clutch cone assembly 111-125-020 and clean the cork surface and the surface of the flywheel gear 111-108-020.	
12. In the cut before mode, the clamps drop, then raise, and drop again.	The unclamping adjustment is set incorrectly.	34

Sewing Adjustments

Problem	Possible Cause	Page
1. Skipping stitches, breaking top thread.	1. Loopers, spreaders, or needle bar settings out of adjustment. 2. Rough spots on loopers, spreaders, throat plate, or damaged. 3. Needle bent. 4. Improper threading. 5. Tension adjustments incorrect. 6. Throat plate hole too large. 7. Needle hitting edge of throat plate. 8. Clamps are not holding material firmly. 9. Improper needle size. 10. Special tension release out of adjustment. 11. Thread loop not passing smoothly across right looper. 12. Clamp feet set too far away from the needle. 13. Too much movement in the needle bar. 14. Too much movement in looper holder 114-002-000. 15. Needle bar diaphragm set incorrectly. 16. Loopers set too close to needle.	21-28 71-72 33 14-15 28
2. Skipping stitches at the beginning of the buttonhole.	1. Insufficient starting thread. 2. Fork in left spreader not covering thread hole in left looper. 3. Right looper to fast. 4. Clamp feet & mats too far away from the needle. 5. Hole in left looper too big. 6. Loopers too far away from needle.	14, 29
3. Breaking bottom thread.	1. Improper threading. 2. Tension too tight. 3. Left spreader too close to top of left looper. 4. Rough spots on spreaders, loopers, or throat plate.	71-72
4. Missing bottom thread at beginning of buttonhole.	1. Bottom thread cut by trimmer knife. 2. Left spreader too high or low to looper. 3. Left spreader set incorrectly over thread hole in looper.	29

Sewing Adjustments

Problem	Possible Cause	Page
5. Breaking needles.	1. Needle hitting clamp feet. 2. Needle hitting throat plate 3. Needle guard too far away from needles. 4. Needle bar diaphragm set incorrectly. 5. Needle set too close to loopers or spreaders.	28
6. Stitches raveling back on a buttonhole without a flybar.	1. Tension release for top thread set too soon. 2. Right looper or right spreader set incorrectly 3. The hole in throat plate too large 4. Needle penetrating gimp cord.	16-17
7. Sewing speed is uneven.	1. Not enough clutch pressure. Check clutch engage ment and condition of clutch springs 100-800-025. 2. Nylon gear 111-104-020 slipping. Adjust clutch slippage.	55 56

Cutting, Thread Trimming

Problem	Possible Cause	Page
1. Does not cut out the buttonhole each time.	1. Cutting cam 113-036-000 or cutting toe 111-044-000 worn. 2. Cutting lever 111-039-020 is cracked. 3. Cutting knife 113-043-000 is worn. 4. Cutting block 111-156-000 is worn. 5. Head bolts are not tight,	
2. Cut is not straight.	1. Clamp spreading uneven. 2. Knife or knife holder is not set straight in the machine.	34-35
3. Cutting stitches in cut after mode	1. Insufficient clamp spread. 2. Incorrect cutting space or stitch bite. 3. Cutting lever not centralized. 4. Insufficient clamp pressure.	35 19-20 32 33
4. Trimmer knife cuts bottom thread.	1. Trimmer knife set improperly.	29-30
5. The cut is not in the center of the buttonhole	1. Check flybar pins 113-054-000 for alignment with flybar camplate 112-055-000.	41-43

Appearance of Buttonhole

Problem	Possible Cause	Page
1. Stitch formation is not tight.	1. Thread loop is not sliding all the way back on the left looper. Loopers, spreaders, & throat plate require polishing. 2. Top & bottom thread tensions not balanced. Check tensions for dirt. Polish tension disks.	
2. Stitch density is not the same around the buttonhole.	1. Not enough friction on the main cam.	40
3. Not enough stitches in the eye of the buttonhole.	1. Stitch wedge112-016-020 not adjusted properly.	7
4. Not enough stitches in the buttonhole.	1. Increase number of stitches. 2. Increase friction on main cam.	6 40
5. Too much material between the rows of stitches in the cut after mode.	1. Too much cutting space.	20
6. Stitch bite appears to be too narrow in the cut before mode. Stitching is on the edge of the cut.	1. Too much clamp spread.	34-35
7. Too much material between the rows of stitches in the cut before mode.	1. Not enough clamp spread.	34-35
8. Eye shape distorted.	1. Top & bottom tensions not balanced. 2. Gimp cord not pulling freely. 3. Cutting knife 113-043-000 not sharp. 4. Uneven clamp spreading. 5. Race turning at wrong time or not alilgned properly.	 34-35 38
9. Stitch bite appears to be narrower on the second side of the buttonhole.	1. Check that the roller tension 111-221-020 turns freely. 2. Check the slot in the roller tension 111-221-020. It should be clean and smooth.	

Motor, Quick Stop

Problem	Possible Cause	Page
1. Motor does not run.	1. No power supply. 2. Incorrect voltage. 3. Faulty table switch. 4. Faulty motor. 5. Pedal switch 119-401-001 set too far away from the end of the pedal bar. Switch should click when pedal is pressed.	
2 Table switch does not stay on .	1. Power relay defective.	
3. Motor does not turn off when foot pedal is depressed.	1. Cut-off switch 119-401-001 is not operating. 2. Table switch is defective	
4. Machine does not stop quickly when the foot pedal is depressed.	1. Brake pad 119-110-000 worn or missing on the foot pedal.	

Specifications

Sewing Speed 1650 stitches / minute	**Buttonhole Length** 12-32mm (1/2" - 1 1/4")	**Flybar Length** 0-10mm (0" - 3/8")
Stitch Density 6-30 stitches/cm (15-75 stitches per inch)	**Eye Shape** Adjustable as Regular eye or No eye	**Cutting Modes** Adjustable to Cut Before or Cut After
Thread Trimming Trims top thread	**Lubrication** Semi-Automatic	**Head Mounting** Recessed or Surface Mount
Electrical Specifications 220V, 50/60Hz, 3 phase 380V-440V, 50/60Hz, 3 phase 220V, 50/60Hz, 1 phase 110V, 60Hz, 1 phase	**Motor Specifications** 370 Watts, 1/2HP	
Table Dimensions Size : 110cm x 70cm x height 77cm Weight : 63kg	**Head Dimensions** Size : 55cm x 33cm x height 44cm Weight : 60kg	**Shipping Weight & Dimensions** Size : 115cm x 78cm x height 81cm Weight (Head & Table) : 137kg

Accessories

One "T" Wrench, 4mm	**Seven Allen Keys of sizes 1.5, 2, 2.5, 3, 4, 5, & 6mm**	**Two Cutting Blocks, 19 & 22mm**
One No Eye Cutting Knife	**One No Eye Cutting Block**	**One Pin Wrench**
One Threading Wire	**One Tweezers**	**Instruction Manual & Operator's Manual**
1 Pack of Needles	**One Oil Container**	**Parts Manual**

Needles

Company	Cotton, Wool, Jeans	Jersey, Knit	Leather, Suede
Schmetz	Classification: 558 Sizes: 80, 90, 100, 110, 120	Classification: 558 SES Sizes: 80, 90, 100, 110, 120	Classification: 558 S Sizes: 90, 100, 110
Grotz-Beckert	Classification: 558 Sizes: 80, 90, 100, 110, 120, 130	Classification: 558 Sizes: 80, 90, 100, 110, 120	Classification: 558 SAN 1 Sizes: 100,120
Organ	Classification: DOx558 Sizes: 90, 100, 110, 120	Classification: DOx558 Sizes: 90, 100, 110, 120	N/A

Specifications, accessories & needles sizes are subject to change without notice.

LUBRICATION

IT IS STRONGLY RECOMMENDED TO USE A MEDIUM WEIGHT OIL FOR THE K150. IT IS NOT RECOMMENDED TO USE THE OIL NORMALLY USED WITH THE HIGH SPEED LOCKSTITCH OR OVERLOCK MACHINES.

The K150 uses an oil wick system throughout most of the machine, and it is only necessary to check the oil levels, and fill as necessary. The flow of oil from the main oil reservoir can be adjusted with the set screw in the top of the oil reservoir.

Some parts have to be oiled individually, and are identified with red paint. Refer to the next page for a list of the parts.

MAIN OIL RESERVOIR

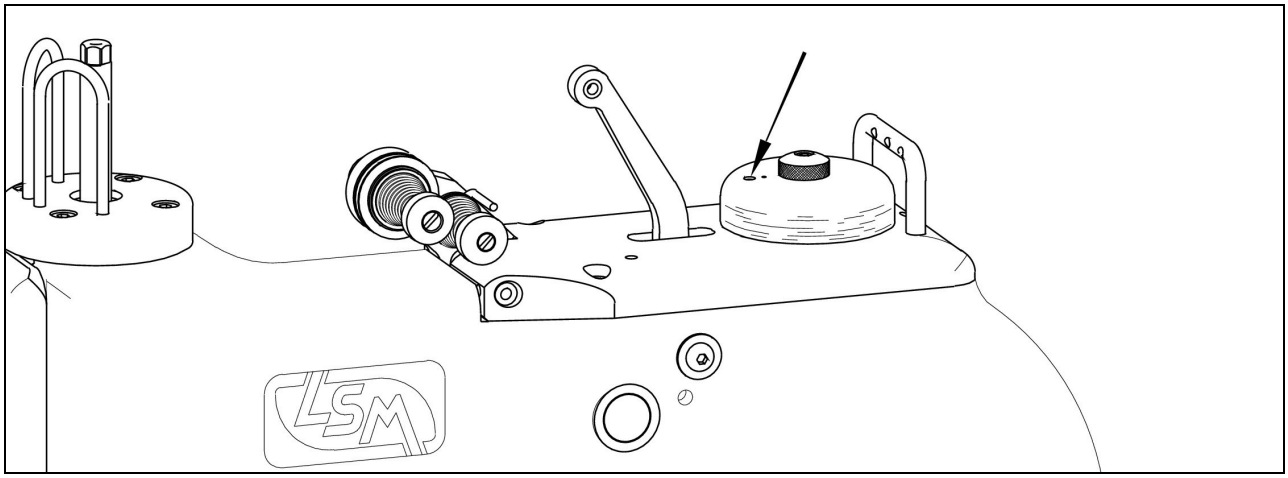


Fig 1

NEEDLE BAR RESERVOIR

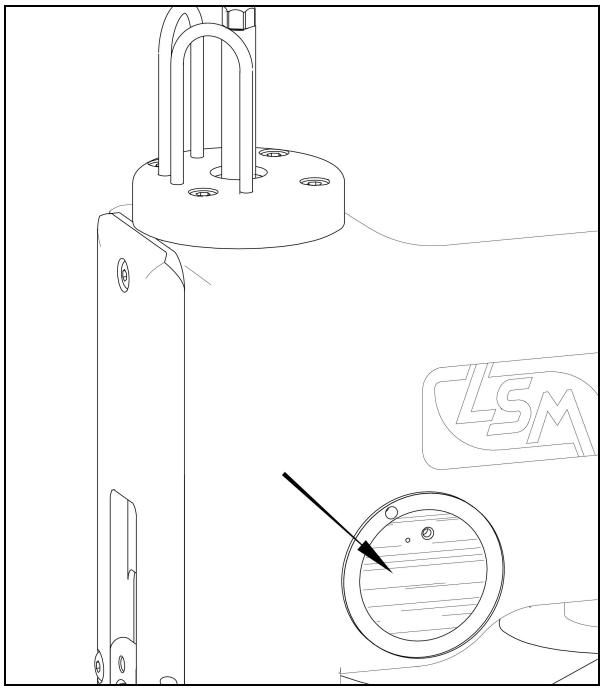


Fig 2

RACE OIL RESERVOIR

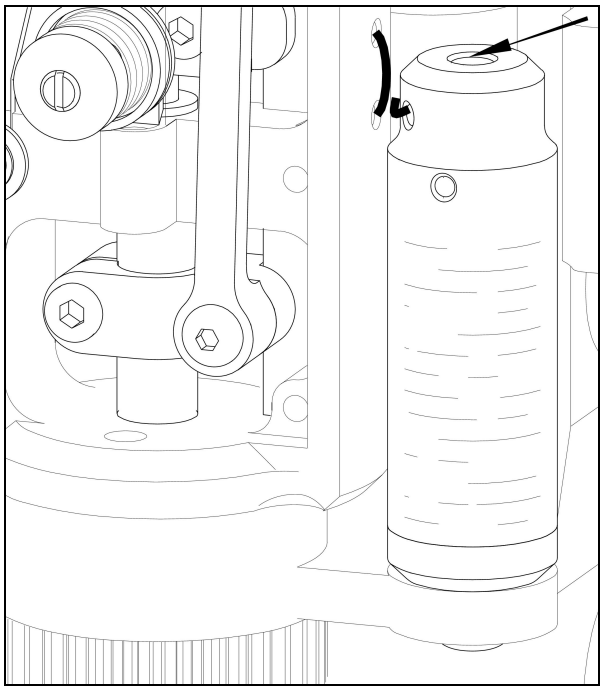


Fig 3

The following parts should be oiled once a week.

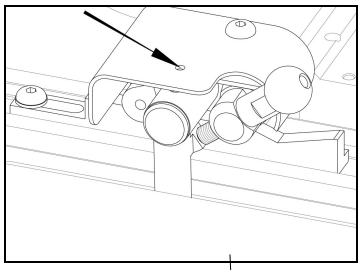


Fig 1

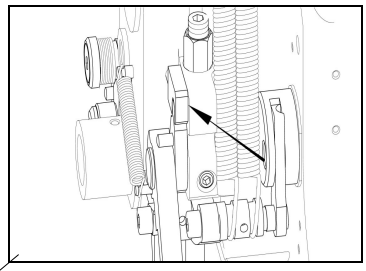


Fig 2

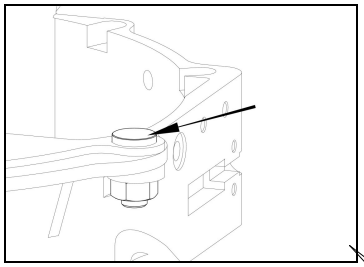


Fig 3

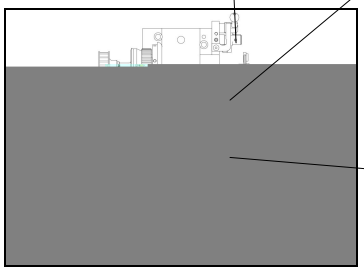


Fig 4

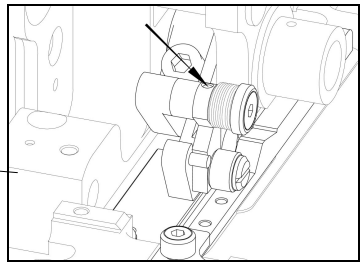


Fig 5

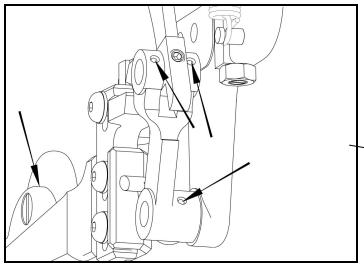


Fig 6

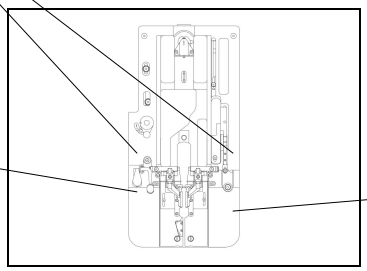


Fig 7

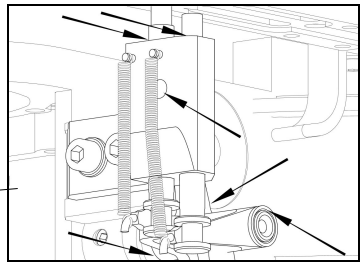


Fig 8

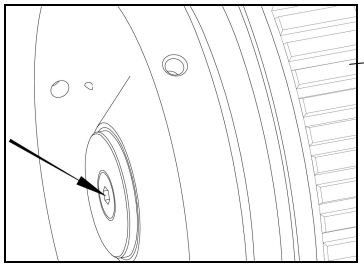


Fig 9

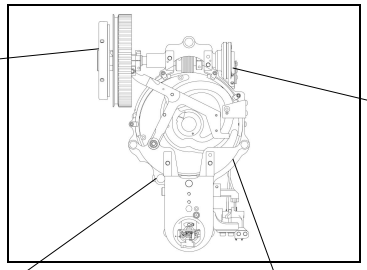


Fig 10

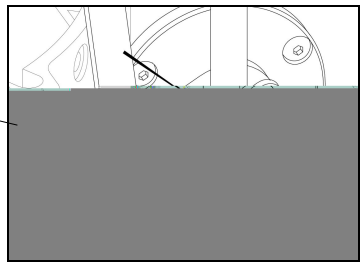


Fig 11

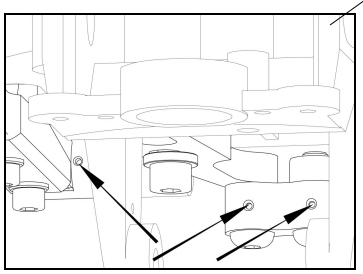


Fig 12

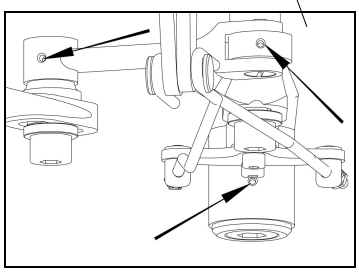


Fig 13

TOP THREAD

Thread Guide, Thread Take-up, and Top Thread Tension

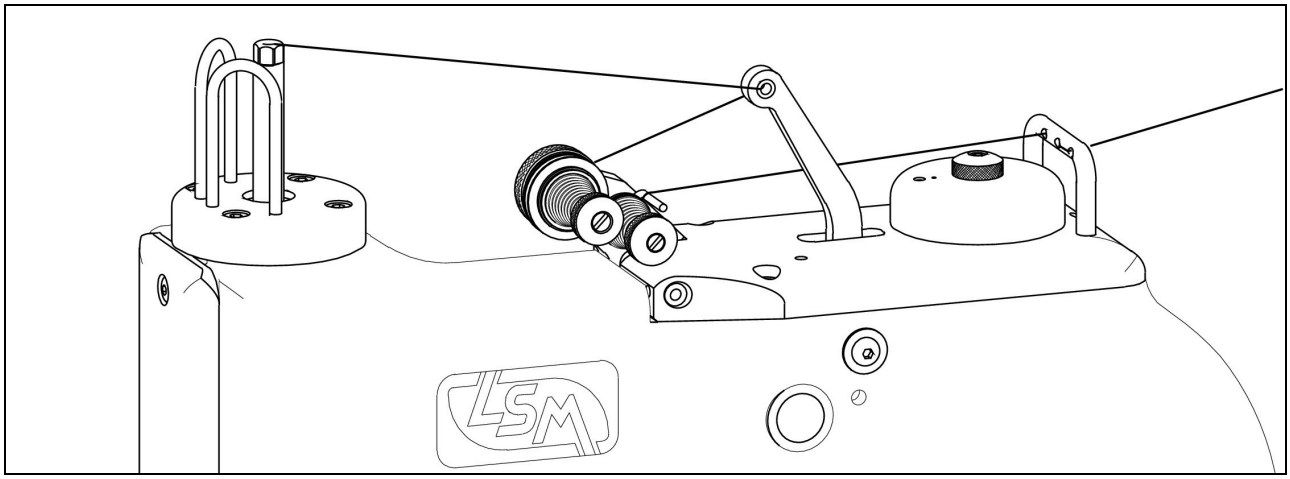


Fig 1

Needle Bar Tension

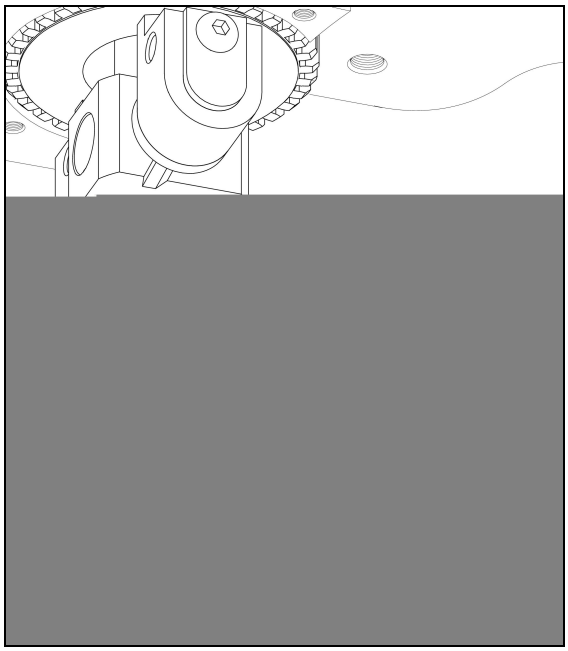


Fig 2

Roller Tension

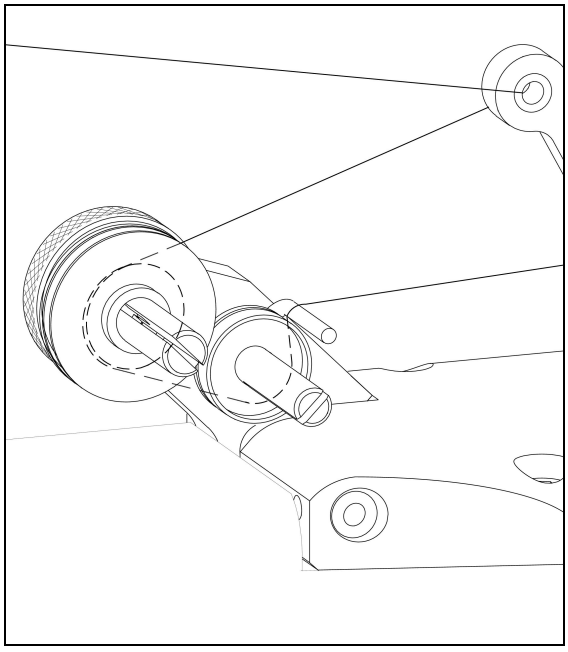


Fig 3

Bottom Thread

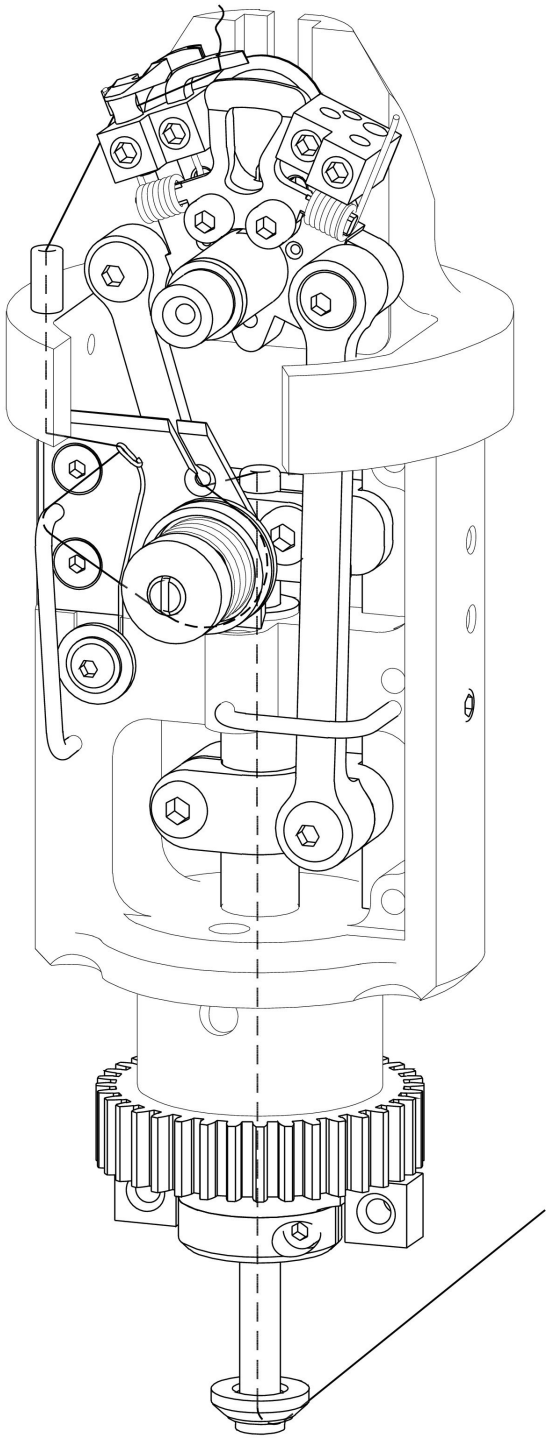


Fig 1

Gimp Cord

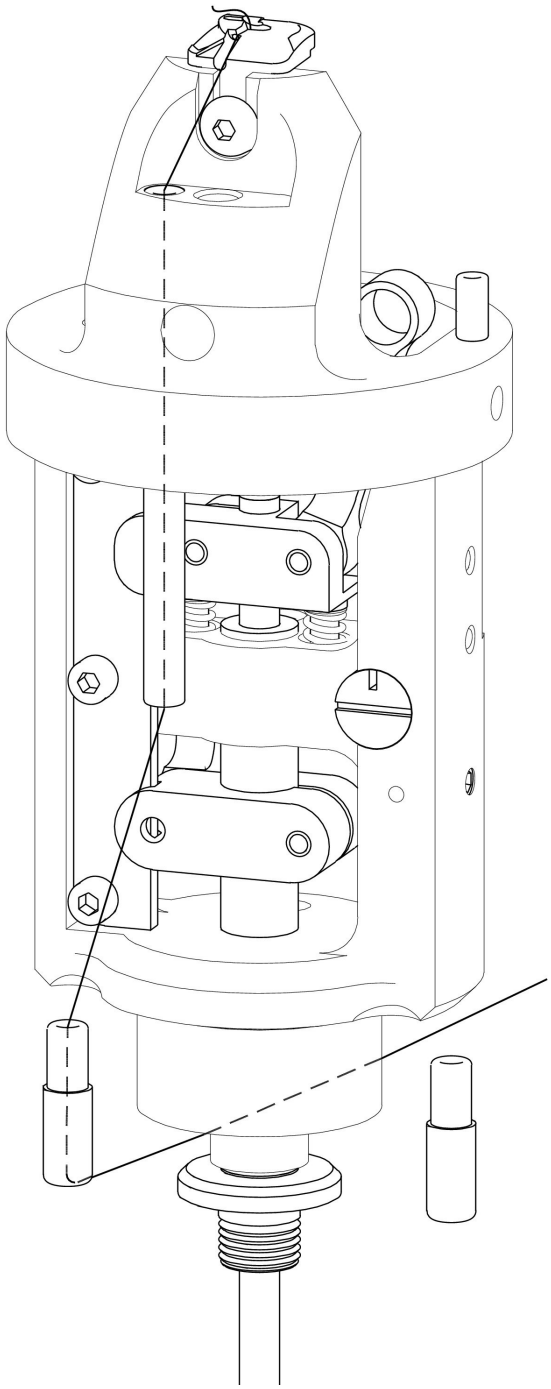
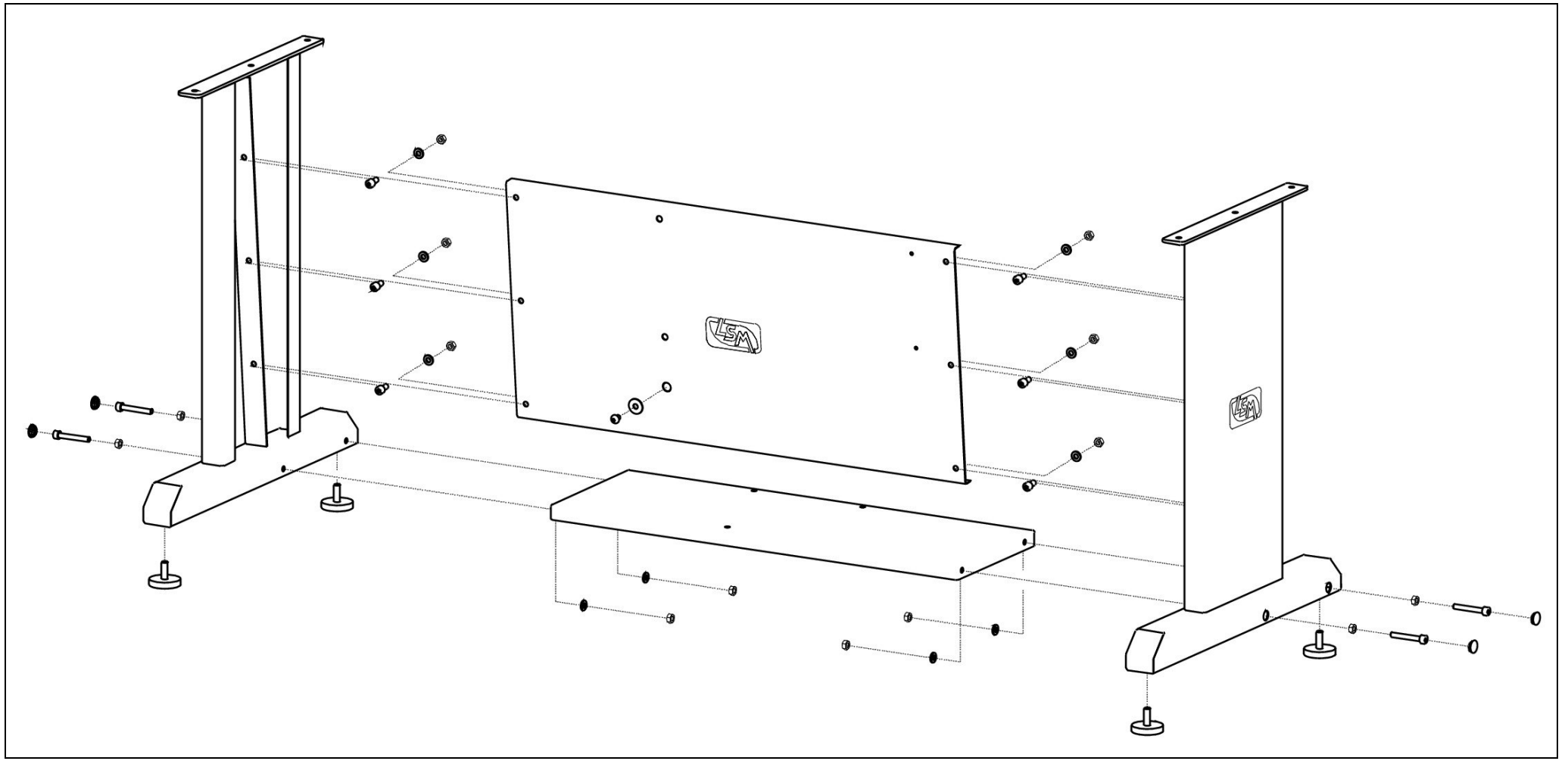
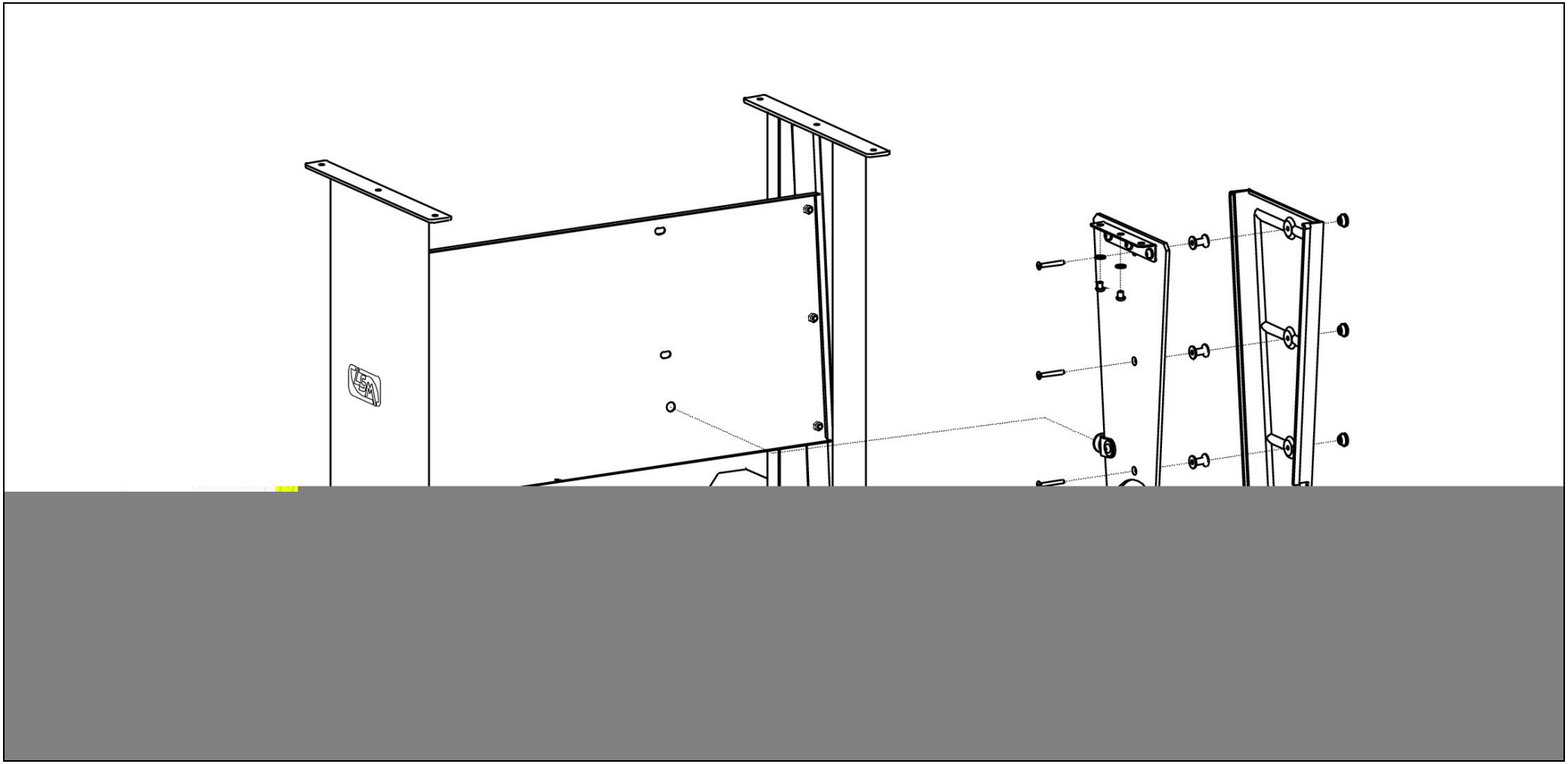


Fig 2

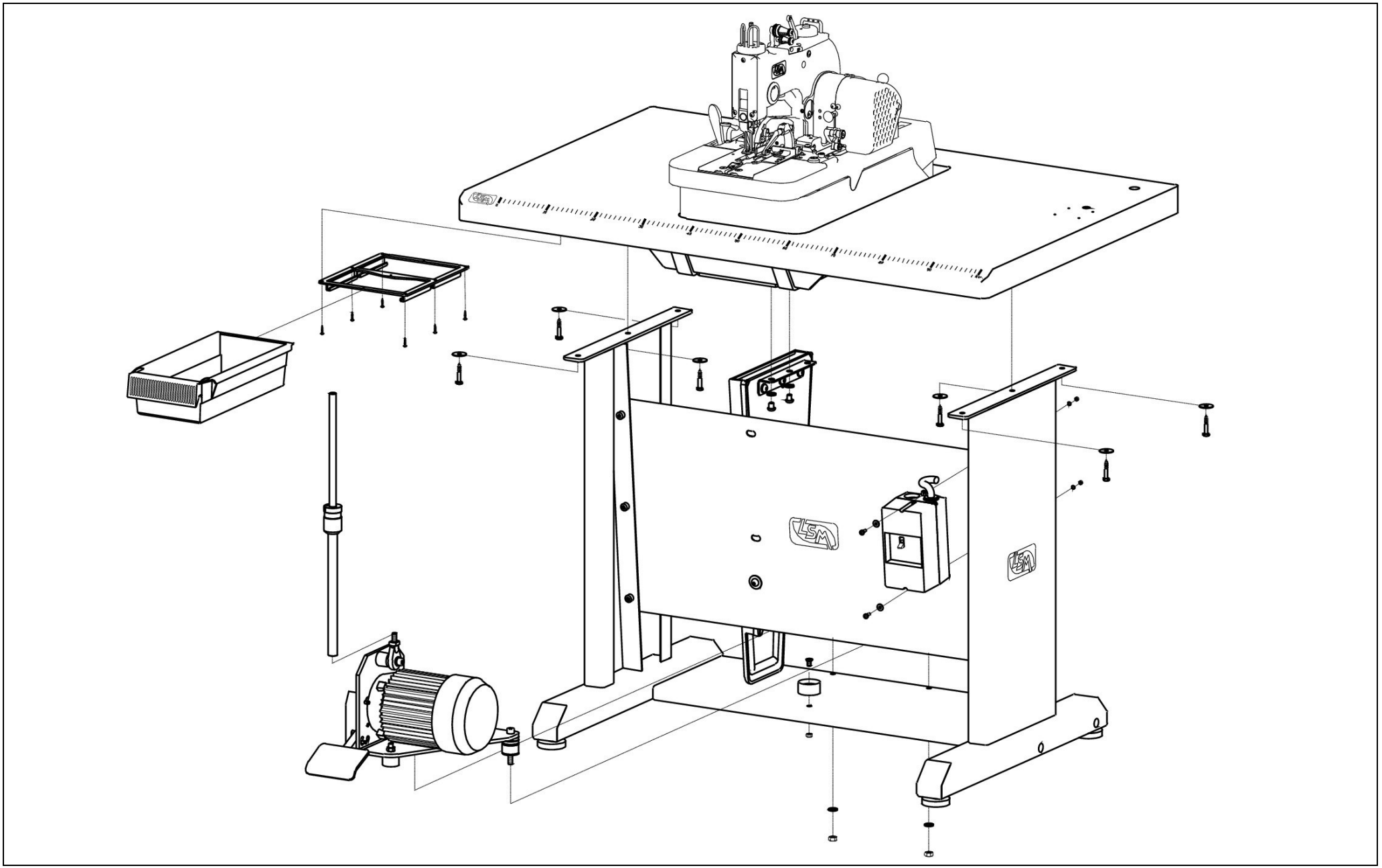
STEP 1



STEP 2



STEP3



STEP4