MODEL GLOBAL BH 1000

EYELET BUTTONHOLE MACHINE

PARTS AND SERVICE MANUAL

MACHINE SERIAL No.

TABLE OF CONTENTS

Page

A - INTRODUCTION
1. INSTRUCTION FOR SAFETY OF WORK 1-1
2. INSTRUCTIONS FOR THE SECURITY OF THE OPERATOR AND MAINTENANCE 1-2
3. LIST OF THE SAFETY LABELS AND DEVICES 1-4
4. POSITION OF THE LABELS AND THE SAFETY DEVICES 1-5

B - MACHINE INSTALLATION
1. CONTENT OF THE SHIPPING BOX 1-6
2. MACHINE UNPACKING AND ASSEMBLING 1-7
3. ADJUSTMENT OF THE T - BELT TENSION FOR SEWING 1-10
4. ADJUSTMENT OF THE LEFT T-BELT TENSION 1-11
5. THREAD STAND INSTALLATION 1-12

C - OPERATOR INSTRUCTIONS
1. PREPARING TO SEW 1-13
2. NEEDLE INSTALLATION 1-14
3. THREADING 1-14

D - MACHINE ADJUSTMENT
1. STITCHES DENSITY ADJUSTMENT - STRAIGHT SECTION 1-17
2. ADJUSTMENT OF THE STITCHES DENSITY IN THE EYE 1-20
3. LENGTHS OF THE SEWING 1-21
4. CHANGE OF THE BUTTONHOLE SHAPE - CHANGE OF THE LATERAL CAM 1-22
5. CHANGE OF THE WIDTH BITE 1-23
6. PRINCIPLES OF SEWING 1-26
7. BED PLATE ALIGNMENT 1-32
8. SETTING OF THE CAM POSITION 1-32
9. TURNING MECHANISM 1-33
10. STOPPING MECHANISM 1-35
11. SETTING-UP OF THE MECHANISM FOR FABRIC CLAMPING 1-37
12. CLAMP PLATE SPREADING 1-38
13. LENGTH SETTING-UP OF THE SECOND BUTTONHOLE ROW 1-39
15. NEEDLE BAR HEIGHT 1-40
16. ADJUSTMENT OF THE LOOPERS TO THE NEEDLE 1-41
17. SPREADERS ADJUSTMENT 1-42
18. ADJUSTMENT OF THE LOOPERS MOVEMENT 1-43
19. SETTING - UP OF THE SPREADERS MOVEMENT 1-46
20. CUTTING LEVER AND ANVIL 1-47
21. KNIFE AND CUTTING STEEL CHANGE 1-48
22. CUTTING SPACE MODIFICATION 1-50
23. CUT BEFORE AND CUT AFTER 1-51
24. KNIFE ADJUSTMENT FOR UPPER THREAD TRIM 1-52
25. THREAD DRAW OFF MECHANISM 1-54

E - MACHINE MAINTENANCE
1. CLEANING AND MAINTENANCE THE MACHINE 1-55
2. PERIODIC MAINTENANCE 1-56
3. MACHINE LUBRICATION 1-57
4. MACHINE DISPOSAL 1-58

F - DOCUMENTATION
1. ELECTRICAL WIRING DIAGRAMS 1-59
ASSEMBLY DIAGRAM 1-60
DIAGRAM OF CONNECTION 1N+PE 115V/60Hz 1-61
DIAGRAM OF CONNECTION 1N+PE 230V/50Hz 1-62
DIAGRAM OF CONNECTION 3N+PE 400V/50Hz 1-63
DIAGRAM OF CONNECTION 3N+PE 230V/60Hz 1-64

A - INTRODUCTION

1. INSTRUCTION FOR SAFETY OF WORK

The sewing machine BH 1000 is designed and produced to be highly reliable. Special attention is given for securing of the service simplicity and effective safety protection of the operators and machine maintenance.

The machine BH 1000 has safety appliance which protects operator but also machine and respects valid safety and hygienic rules for usual technological using of the machine. These safety appliances include plug of supply, operating switch (circuit breaker) and covers.

There are safety labels placed on the machine for warning for supplementary danger. Do not remove and damage these labels. When the label is damaged, order the new one. The said precautions can not cover all safety aspects that is why operator before using of the machine has to read and understand to this instructions. The mistakes will be eliminated during machine installation and during its own operation. Do not try to put the machine into operation without reading all the machine instructions and until well understanding to every function and progress.

There are three types of safety direction in these instructions:

DANGER! Possible loss of life.

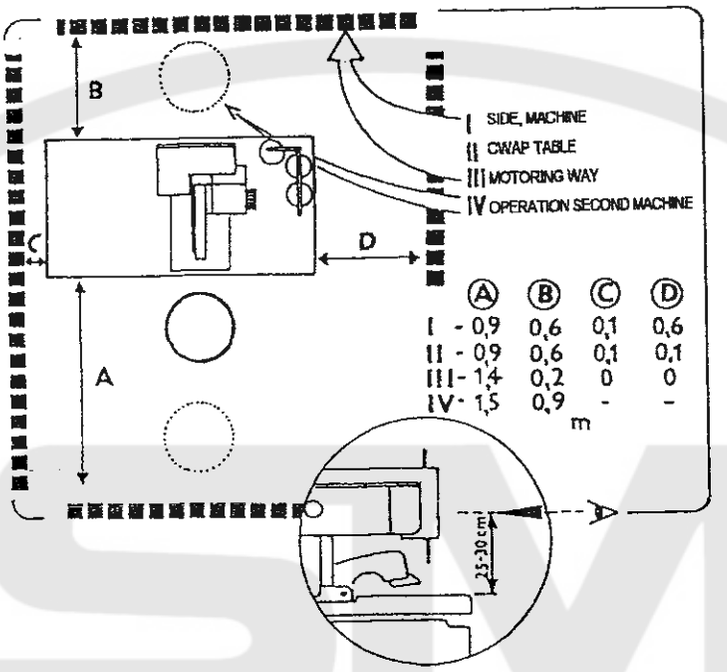
WARNING! Possible serious injury or machine damage.

NOTICE! Possible injury or machine damage.

It is recommended to service workers from our company oversaw to the installation and initial training of mechanics and operators.
Strictly given safety program, which part is the direction for safety operation, is the most effective security of the workers safety during the operating with the machine. The secure work with the machine is ensured by the safety covers which are useful, if they are mounted and fixed correctly. The warning labels and service must be done according to the instructions. Operators and service workers should wear safety goggles.

2. INSTRUCTIONS FOR THE SECURITY OF THE OPERATOR AND MAINTENANCE

When the machine is set to the working area, it is recommended to keep the minimal distance said in the drawing.



DANGER!

- Before machine connection to the power make sure, whether all safety covers are mounted.
- If it is necessary to remove some safety covers, switch off the operating switch (circuit breaker) and disconnect the machine by the fork of supply from the socket.
- Do not connect the machine to the power if some cover is removed.

WARNING!

- Remember the position of the operating switch (circuit breaker) so that is possible use it from the arbitrary position.
- Make sure, whether supply of energy and its dimensioning and safeguarding allows permanent supply of energy needed for dependable output of the machine.
- Do not forget to persuade yourself before fork connection to the socket whether both switches on the machine are switched off.
- Check if the electrical cables are not damaged, so that be touch with uncovered conductor, can not occur any injury.
- Check regularly if the safety covers are correctly mounted and whether they are not damaged.
- When the covers are demaged, repair or replace them immediately for the new ones.
- Do not switch the machine on without covers.
- Do not touch rotary shafts by hands.
- In any circumstance, do not put hands to the needle space.

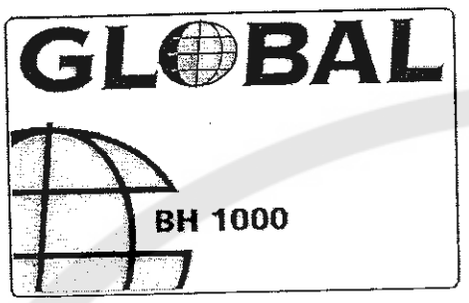
- Before changing the needle, switch off the operating switch (circuit breaker).
- In case when the operator will not work on the machine, disconnect the power supply by removing the plug from the socket.
- Before cleaning or any maintenance work on the machine, disconnect the power supply by removing the plug from the socket.
- Do not adjust the machine in any way, which could endanger its safety.
- Every part of the machine can be dangerous, if there is incorrect manipulation or faulty maintenance with the machine That is why everybody, who will manipulate, maintain or operate with this machine must be acquainted with informations included in this manual.

CAUTION!

- Perform all regular service as described by this manual.
- If there is any problem with power supply, turn off the mine power switch (circuit breaker).
- Do not remove, paint over, damage or any way change safety labels. If a safety labels are lost or cannot be easily read, order the new one in our factory and place them on the original place.
- Long hair and loose clothing may be dangerous near any machinery. Always contain long hair and avoid loose clothing, so that it cannot be caught by machinery and cause injury.
- Never use this machine while under the influence of drugs or alcohol.
- If anything seems to be operating incorrectly in the machine call for maintenance assistance immediately.
- Be sure that there is adequate light for safe operation. A normal minimum light level is 750 Lux.

3. LIST OF THE SAFETY LABELS AND DEVICES

❶



❷

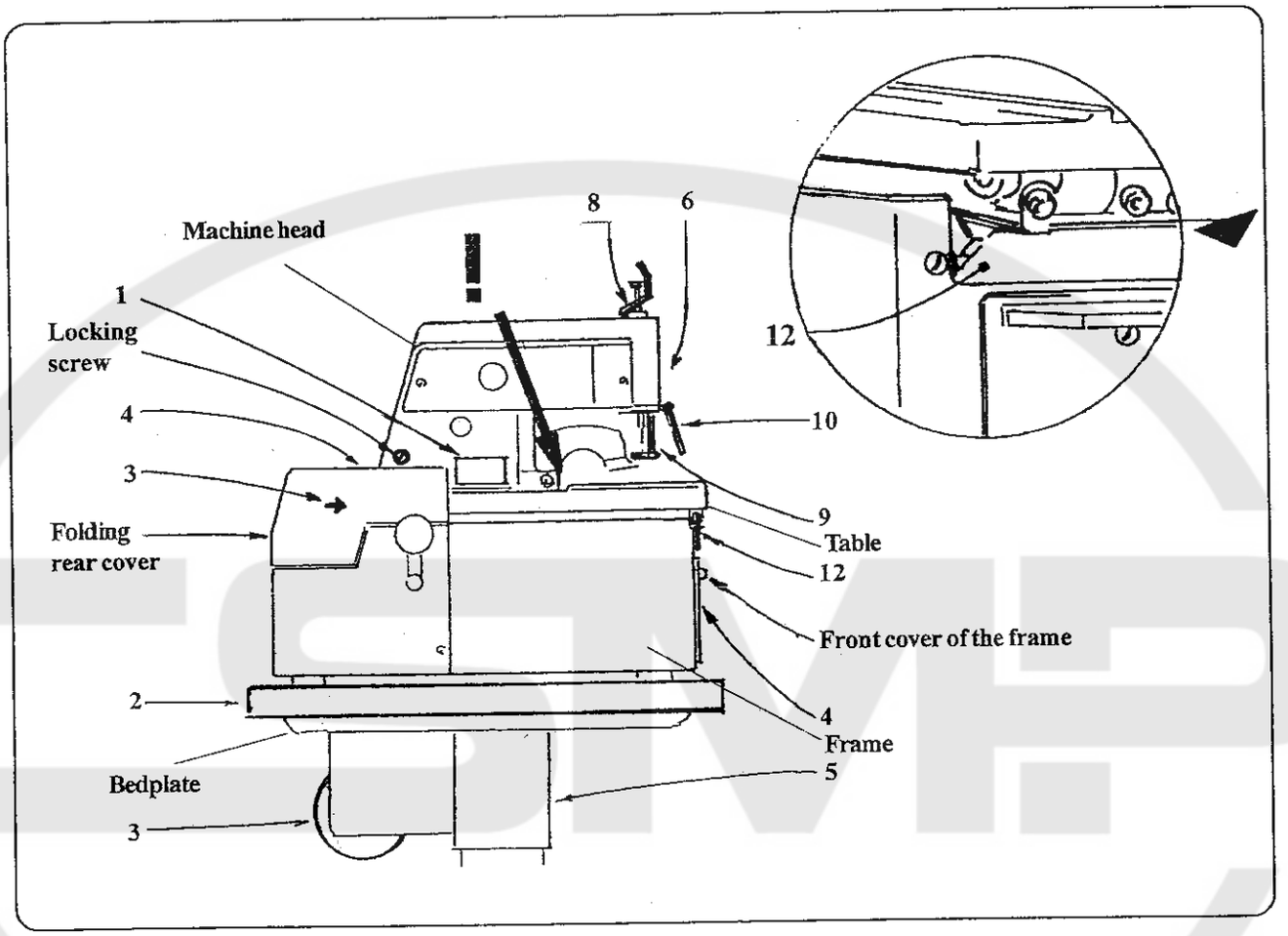
❸

❹

❺

❶ Standard label.
❷ Rotational direction (located on the right cover, left side of the rear cover, motor).
❸ Warning by the cover removing (front cover of the frame, right cover of the drive, rear folding cover, motor cover).
❹ Label of the safety conductor clip.
❺ Necessity of the safety goggles using (sewing head front part, above the needle).
❻ External covers of the machine folding or dismantling by the tools.
❼ Guard of the upper end of the needle bar.
❽ Fixed guard of the needle area.
❾ Folding transparent eye guard - in front of the needle area.
❿ Axis of the tilting head located irregularly to the driving axis. This solution ensure withdrawing of the belts from the driving pulleys for lifting of the head for cleaning and maintenance work . When the motor is switched on, the mechanisms of the sewing head will not move.
⓫ Folding front cover, which precludes the fingers inserting between the moving working board and the fixed frame.

4. POSITION OF THE LABELS AND THE SAFETY DEVICES

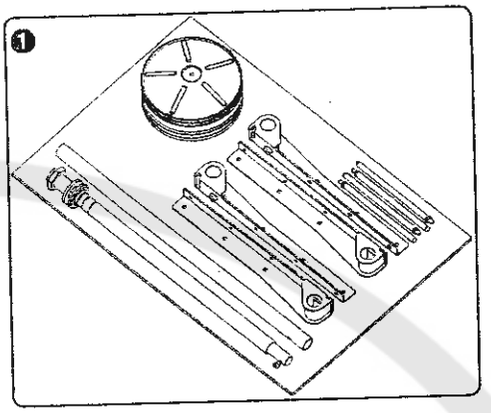


WARNING! When the machine works, it is not disabled to give the fingers to the space between the machine table and machine head in marked place. When the working board moves, the clearance in this place is about 50 mm. If fingers are accidentally put into this place, it can occur very serious injury.

Front cover of the frame and lock screw of the folding rear cover, which disable tilting of the rear cover, are dismantled during transport. It is necessary to install these safety parts to the machine before the machine is switched on.

CAUTION! If it is necessary to lift the head out of the home position, it is necessary to tilt the folding front cover to the operator side, then put the head back. If this process is not kept, and the machine is switched on, the cover will be damaged.

1. CONTENT OF THE SHIPPING BOX



1. The delivery usually contains two boxes. One box contains the table and wiring, second the head of machine.

2. The box contain also carton with accessories and operation instruction with spare parts manual and the thread stand ❶.

3. When unpacking the delivery, follow labels which are on the cover.

CAUTION! If the delivery was damaged during the transport, inform the carrier. Check the contains of the delivery with order. In case that there are some faults, immediately inform the manufacturer - later complains will not be taken into consideration!

2. MACHINE UNPACKING AND ASSEMBLING

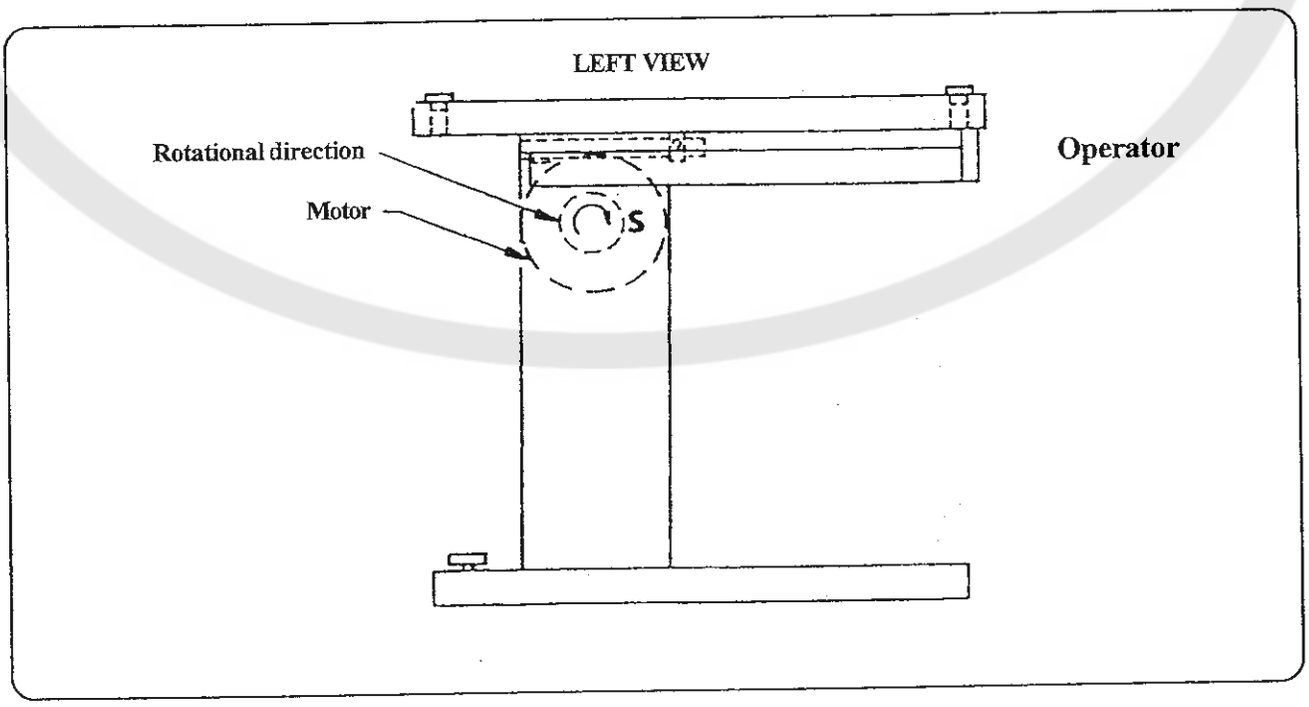
1. After unpacking it is necessary to put the table together according to the enclosed documentation. Delivered table is standardly took apart. For connection of the table frame, use enclosed connecting parts. For ensuring of the conductive connection among all metal parts of the table is necessary to put fan washers under the one of the two neighboring screws.

WARNING! Integrity of the protective connection of the machine metal parts must be kept according to the section DOCUMENTATION - Wiring diagrams.

CAUTION! The wiring assembly can perform only the person, who has an appropriate electrical qualification.

2. After putting the table together and wiring the assembly - before motor cover mounting, install the table to the given place. Its stability is ensured by the rear abutment, which is controlled by the manual screw.

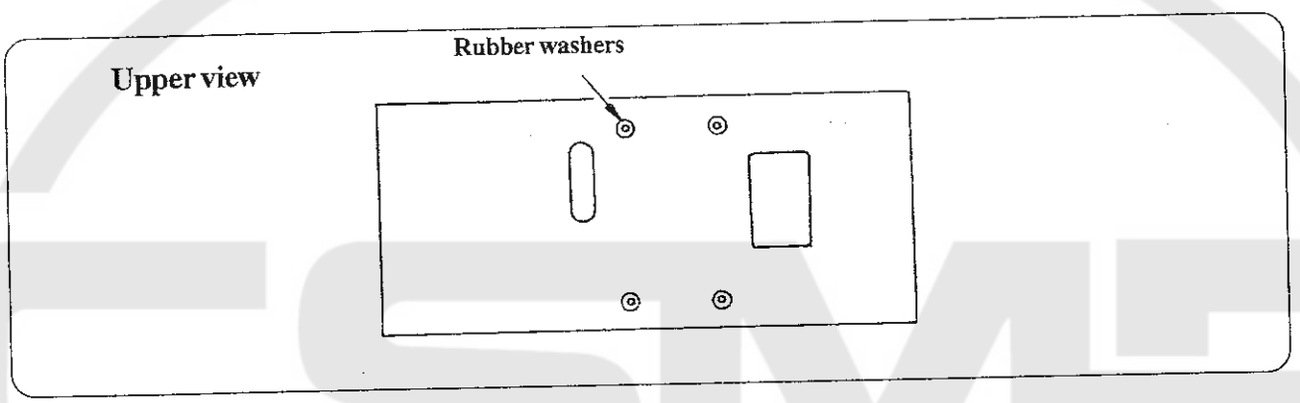
3. Before next assemblies of the machine, it is necessary to control if the motor turns in right direction, it is marked S on drawing. The plug of supply, which is used as a main switch, put into the socket. When the operational switch (circuit breaker) is switched on, activate the motor to run by the foot pedal. Check the right rotational direction of the pulley according to the arrow placed on the motor. Incorrect rotational direction of the electric motor can cause machine damage.



B - MACHINE INSTALLATION

WARNING! It is commended to use original table, part number 04.90.17.0.xxx, for delivered machine. If the user has to use another table, producer can not take the responsibility for possible troubles. In this case it is necessary to use such equipment, which allows to reach on the left driving pulley for the machine cycle max. 250 rev./min. and on the right pulley for sewing drive max 875 rev./min. Higher revolution can cause serious machine damage! The socket for plug of power supply has to comply with requirements of norm IEC 364-4-41.

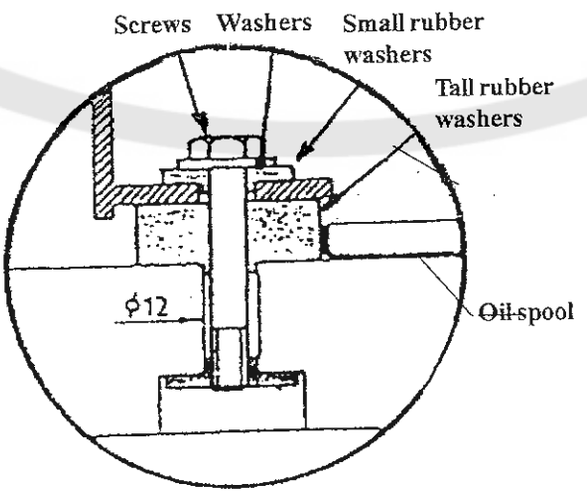
4. Insert tall rubber washers from the accessories to the four holes on the table board.



5. When the head from the cover is taken out, clean the head from the preservative grease. To catch the machine during the manipulation, use slots in front and back of the machine frame.

6. The removed machine head place on the installed rubber washers and according to the drawing fix it by the screws, washers and rubber washers to the table.

CAUTION! Do not take the machine head in the machine table!



B - MACHINE INSTALLATION

7. Fold the rear covers and tilt the head in the frame, make rear screws accessible during the assembly. Since some deliveries can have the covers partly dismantled, fix them to their place by using drawings in parts manual. All safety covers must be assembled according to the section: INTRODUCTION - Position of labels and safety equipment.

8. Oil reservoir should be placed between installed tall rubber washers.

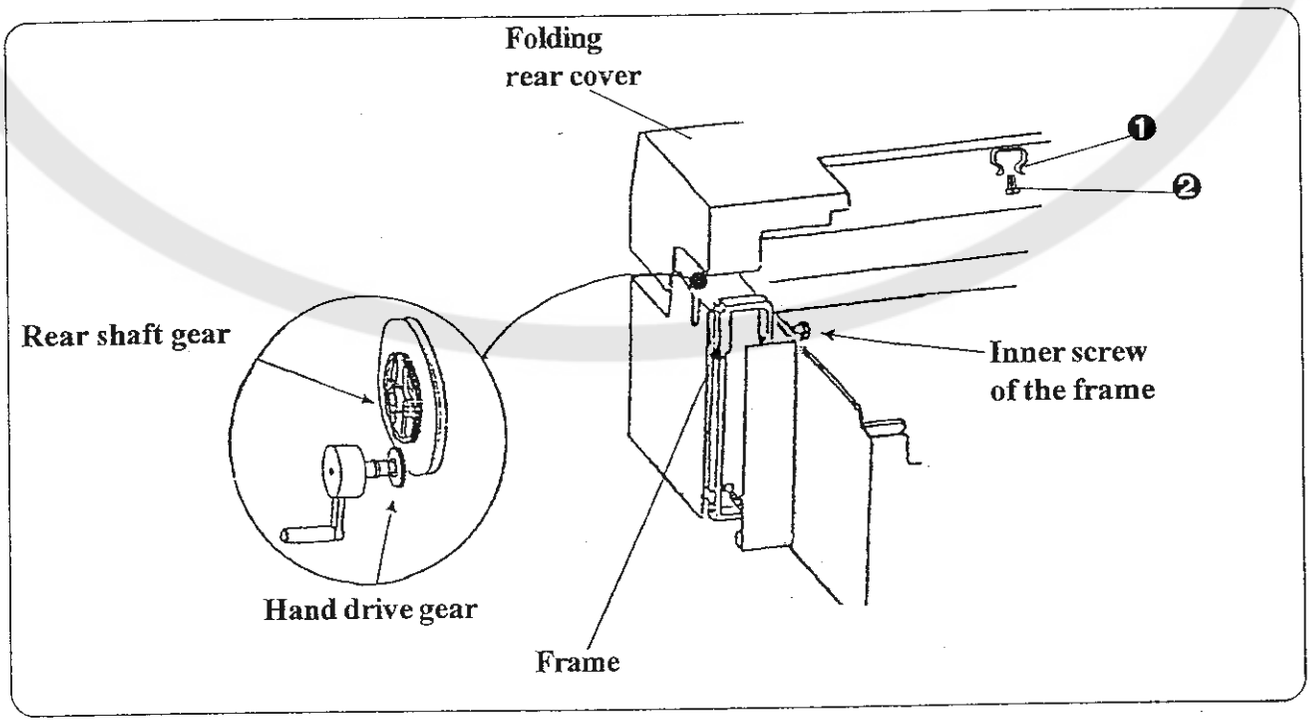
9. The installation of the right driving belt (longer) is done by loosening the screw of the right cover and its removal.

10. If the left drive belt is not put on the upper pulley of the head (tilting the rear cover to have the access to this belt), after loosening the inner screw of the frame, it is necessary to make adequate space between the gear of the hand drive and the gear of the rear shaft by tilting the frame.

11. After belt installation, tighten the frame inner screw again so that both gears fit in, use the hand wheel.
If the belts are correctly mounted, they will not touch the covers or bedplate.

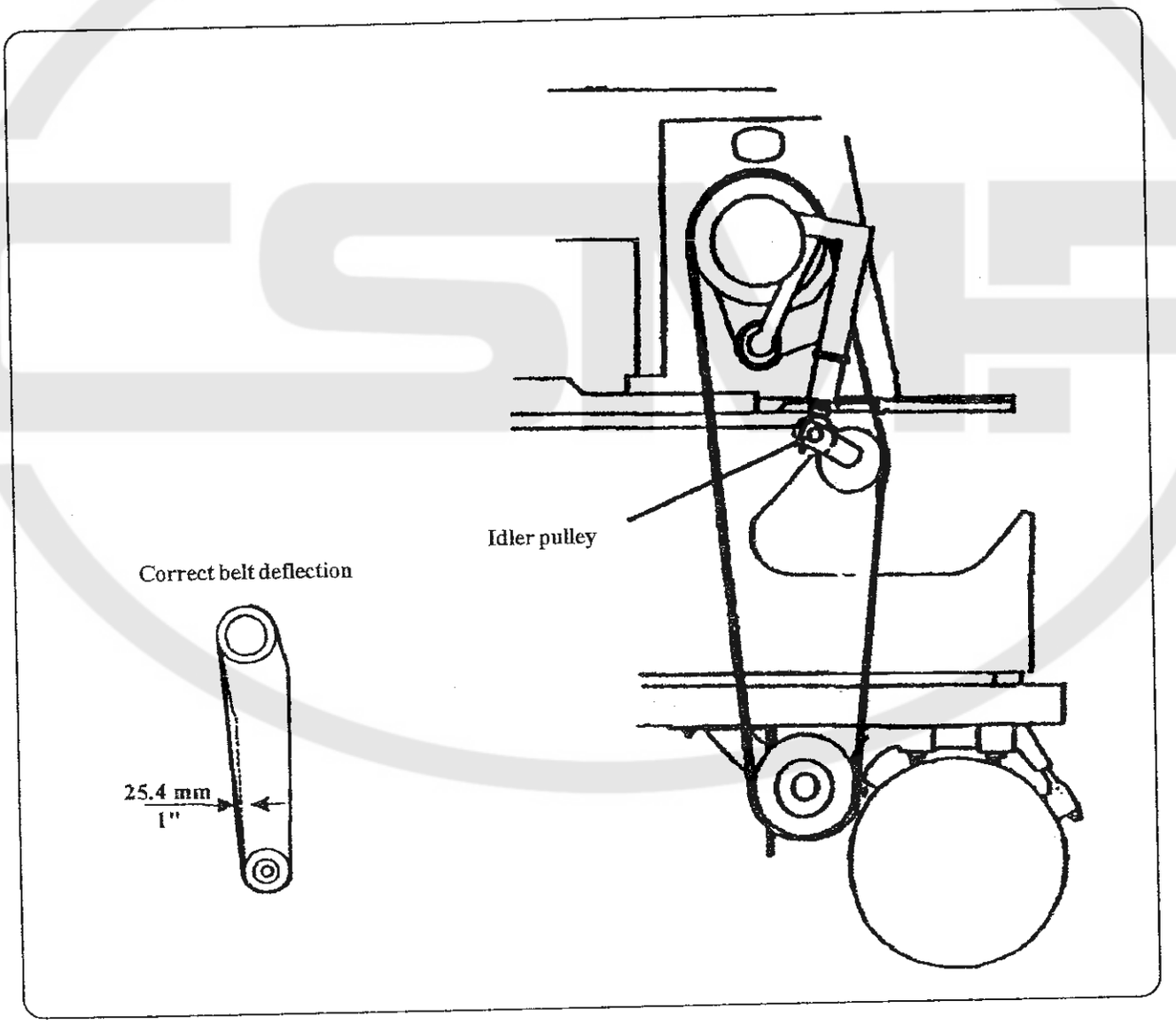
CAUTION! After installing the belts, install the motor cover. It is necessary to connect the cover, machine head and motor by the protective circuit breaker.

12. Before operating the machine, install the clip ❶ and the screw ❷ from the accessories on the rear cover.



3. ADJUSTMENT OF THE T - BELT TENSION FOR SEWING

The driving belt is placed under the right side cover. After its dismantling, loosen the pulley screw and adjust the V - belt pulley so that, so that during pushing on the front branch of the belt, there should be a sag about 25 mm (1"), as illustrated. Tighten the screw of the idler pulley.
For easy folding of the machine head, the pulley must be down with tilt min. 30° backwards.
Install the removed cover again.



4. ADJUSTMENT OF THE LEFT T-BELT TENSION

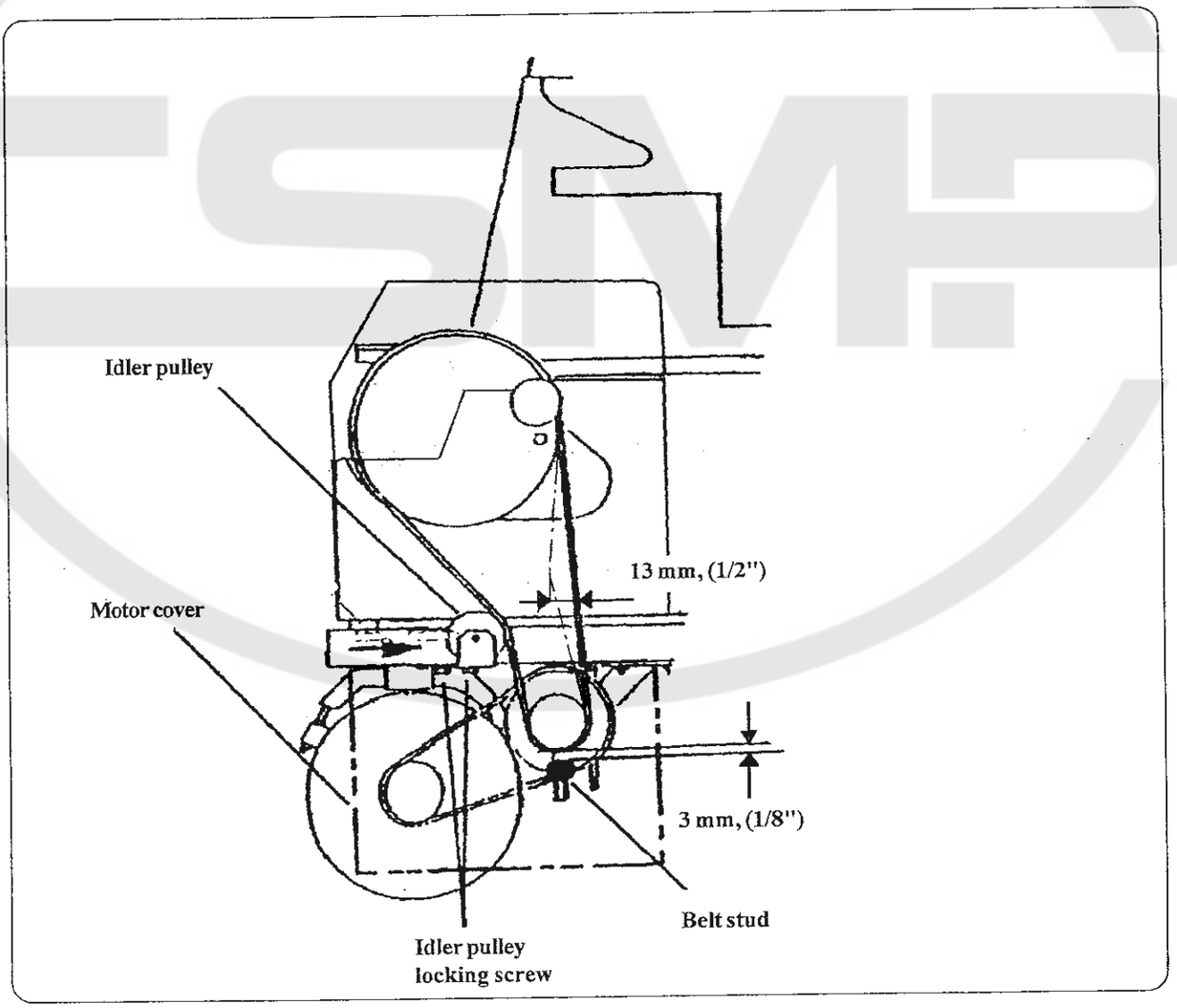
1. The access to the belt will be obtained after folding of the folding rear cover.

2. Then adjust the idler pulley until 13 mm, (1/2") of flex is obtained in the belt, as illustrated.

3. Tighten the idler pulley locking screws.

4. Install the motor covers and set the belt stud, which is fixed on the motor cover to the distance 3 mm, (1/8") below the pulley. This belt stud will prevent dropping of the belt when the machine head is lifted.

5. Install the removed covers again.

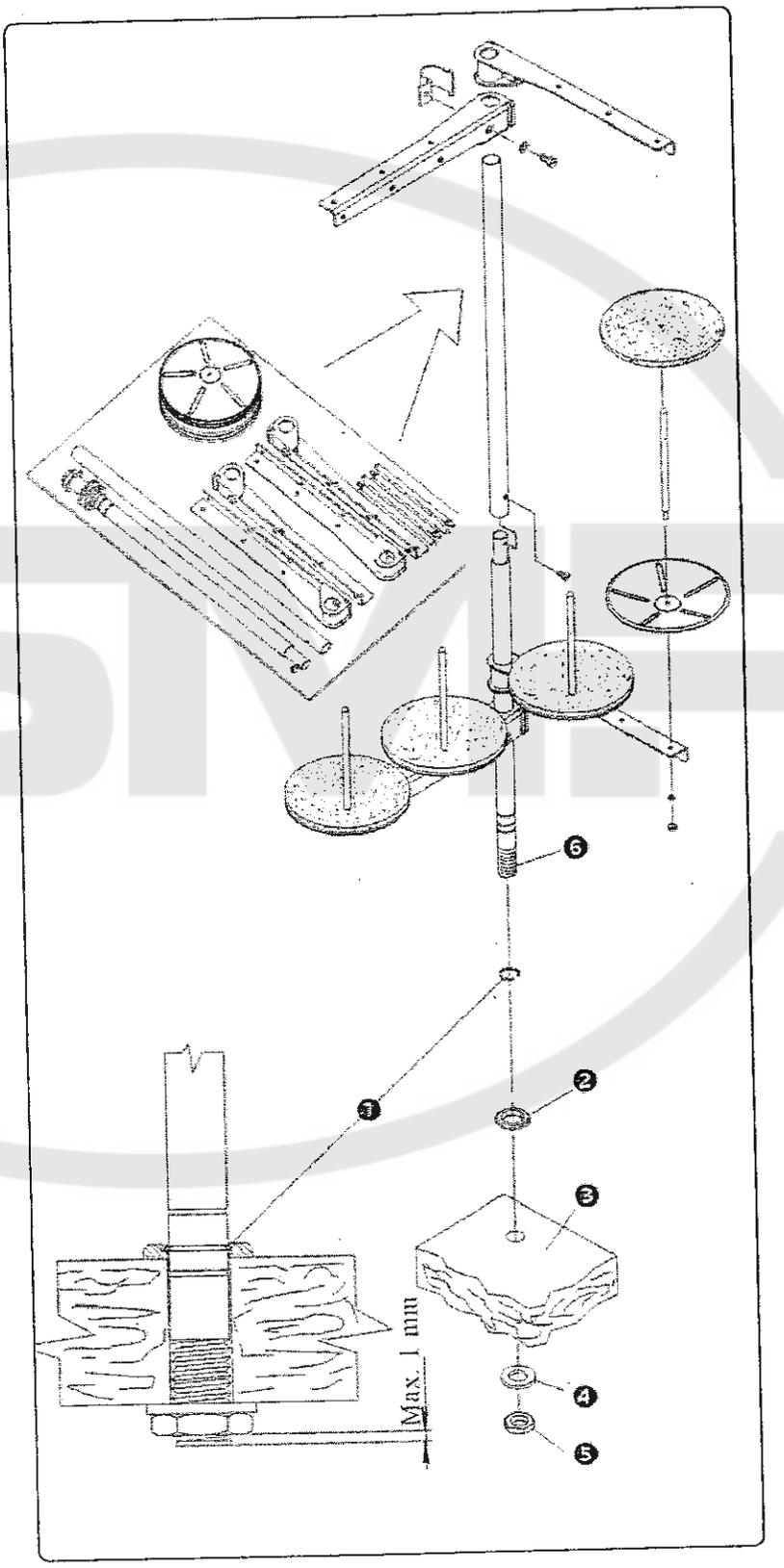


5. THREAD STAND INSTALLATION

1. Put the thread stand together according to the drawing.

2. Position of the locking ring ❶ allows assembly of the thread stand for various thickness of the table top. Threaded end of the post ❻ must not extend more that 1 mm (1/32) through the locking nut ❺.

3. Adjust the ring ❶, insert the washer ❷ and the post into the hole provided in the right rear of the table top ❸. Insert the washer ❹ and tighten the nut ❺.



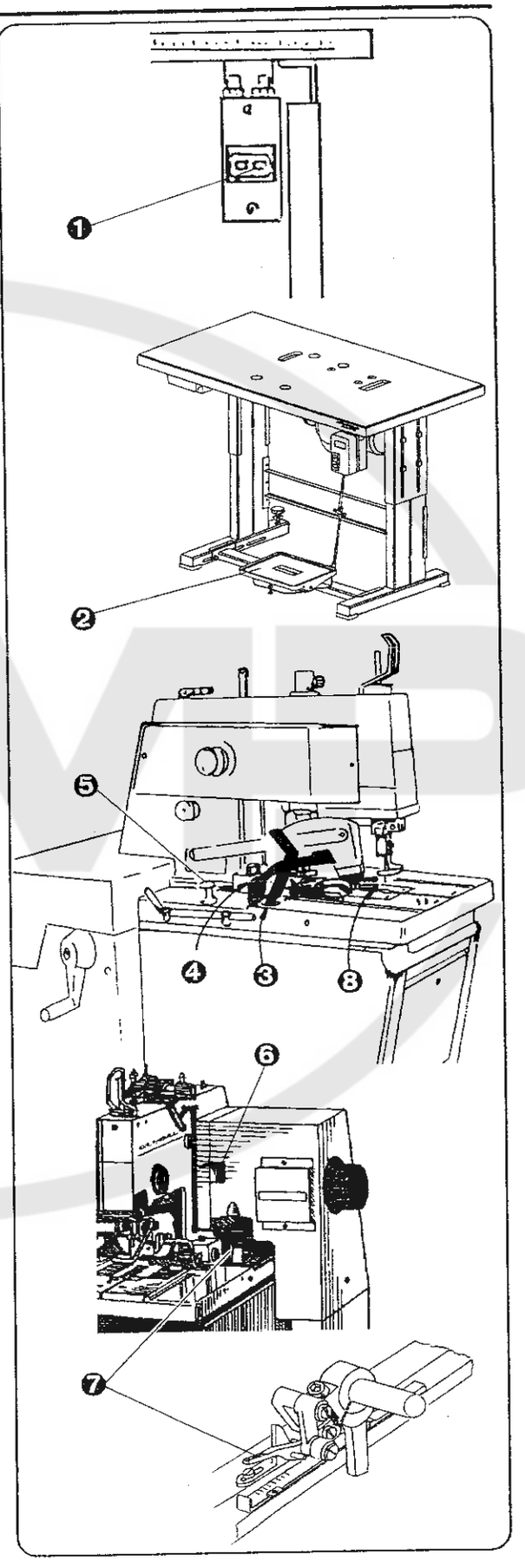
C - OPERATOR INSTRUCTIONS

1. PREPARING TO SEW

1. Read through all safety instructions and ensure all covers are installed.
2. ***Only Cord Trim*** - Check on the air pressure regulator that pressure is in range 4.5 - 5 bars (0.45 - 0.50 MPa), see note above the regulator.
3. Give oil to the manual oiling points and check the correct oil quantity in oil level indicator.
4. Check the needle and gimp threads are correctly threaded.
5. Before the first sewing, insert piece of fabric similar to sewing work under the clamp feet.
6. Insert the input cable into socket and by switching on of the operating switch (circuit breaker) ❶ switch the motor on.
7. Drive of the machine is activated by the table foot pedal ❷.

CAUTION! To make sure the machine is sewing correctly, it is recommended to sew a few buttonholes on a scrap piece of material before sewing on a quality garment.

8. Insert the material under the clamp feet.
9. To lower the clamp feet ❸, move the lever ❽ forward.
10. Press the starting lever ❹, the clamp feet are automatically lowered. After the buttonhole is sewn and cut, the clamp feet are raised.
11. If the emergency stop button ❺ is pressed and held during sewing, the clamp feet will not raise at the end of the sewing cycle and it is possible to sew the buttonhole again.
12. If it is necessary to interrupt the sewing cycle press the stop lever ❻. The machine will finish the cycle without sewing and the clamp foot will raise. (if the stop lever is pressed and then emergency stop is pressed ❺ the machine will finish the cycle without clamp raising.
13. To stop the machine immediately in any place of sewing cycle, press foot pedal (by heel down the sewing cycle is stopped, by toe the sewing cycle is started.
14. To start the sewing cycle without sewing, lift the lever ❼ and after the cycle is started, the machine makes cycle without sewing.

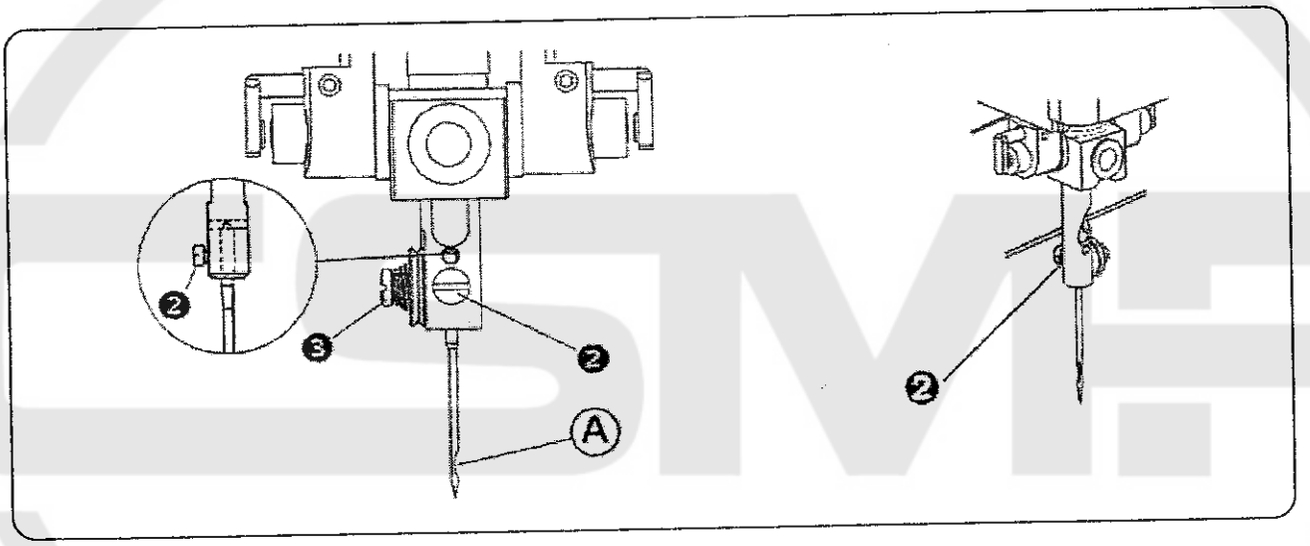


2. NEEDLE INSTALLATION

1. Loosen needle locking screw ❷ and dismantle the original needle.

2. Insert the new needle, so that the needle flat **A** is on opposite side from screw ❸ of the tension. Do not install a bent or broken needle. Roll the needle on a flat surface to check for straightens. The good quality needle does not have a deflection of the point.

3. Tighten the needle locking screw ❷ well.



3. THREADING

WARNING! Check if the operating switch (circuit breaker) is switched off.

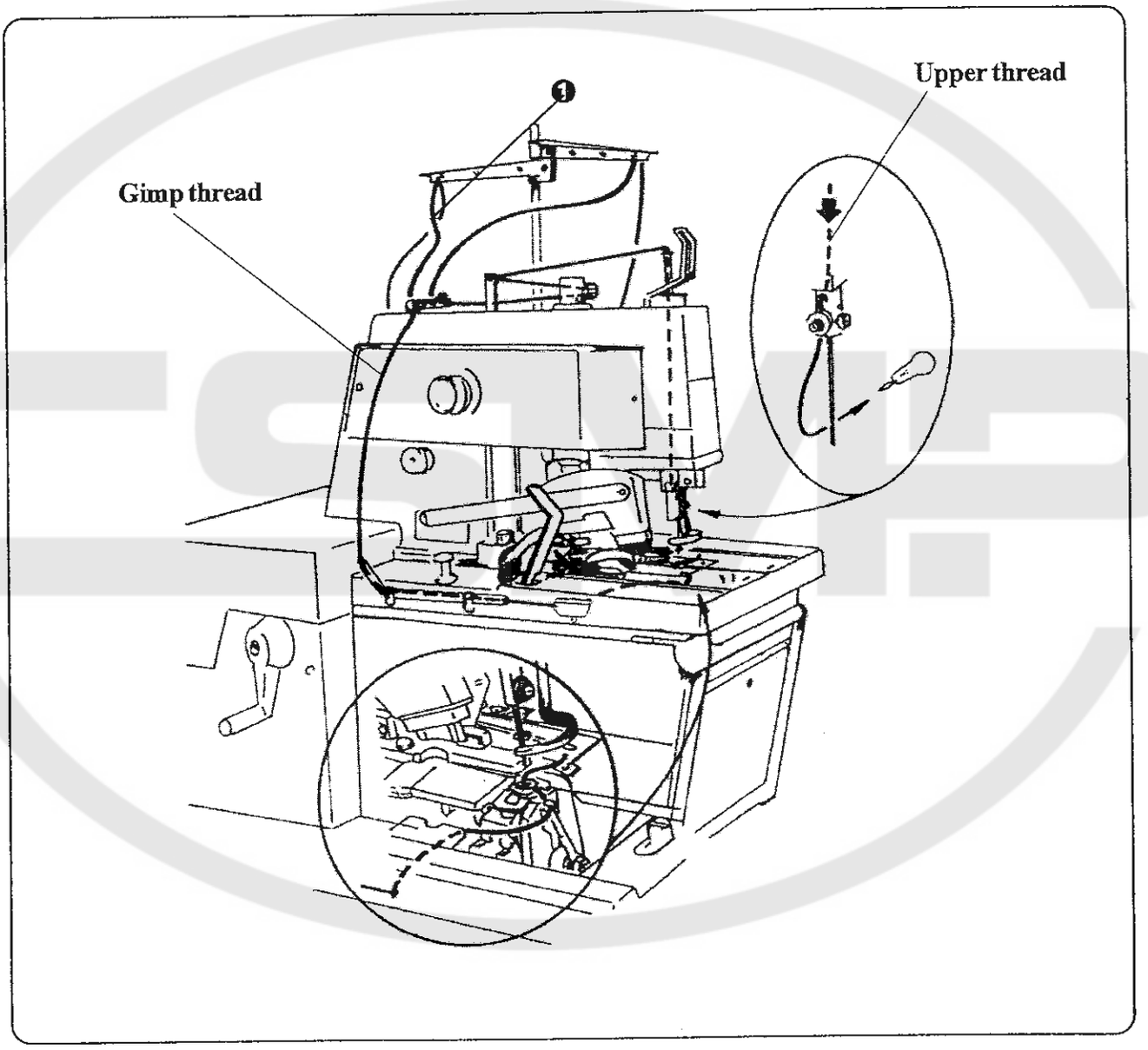
Thread the thread, as illustrated.

The appearance and quality of the buttonhole may be affected by one or more of the following

- stitches density
- used thread strength, colour
- thread elasticity
- used sewn material
- tension of upper and lower thread
- used thread thickness
- width of stitches
- choosen sewing thechnological procedure

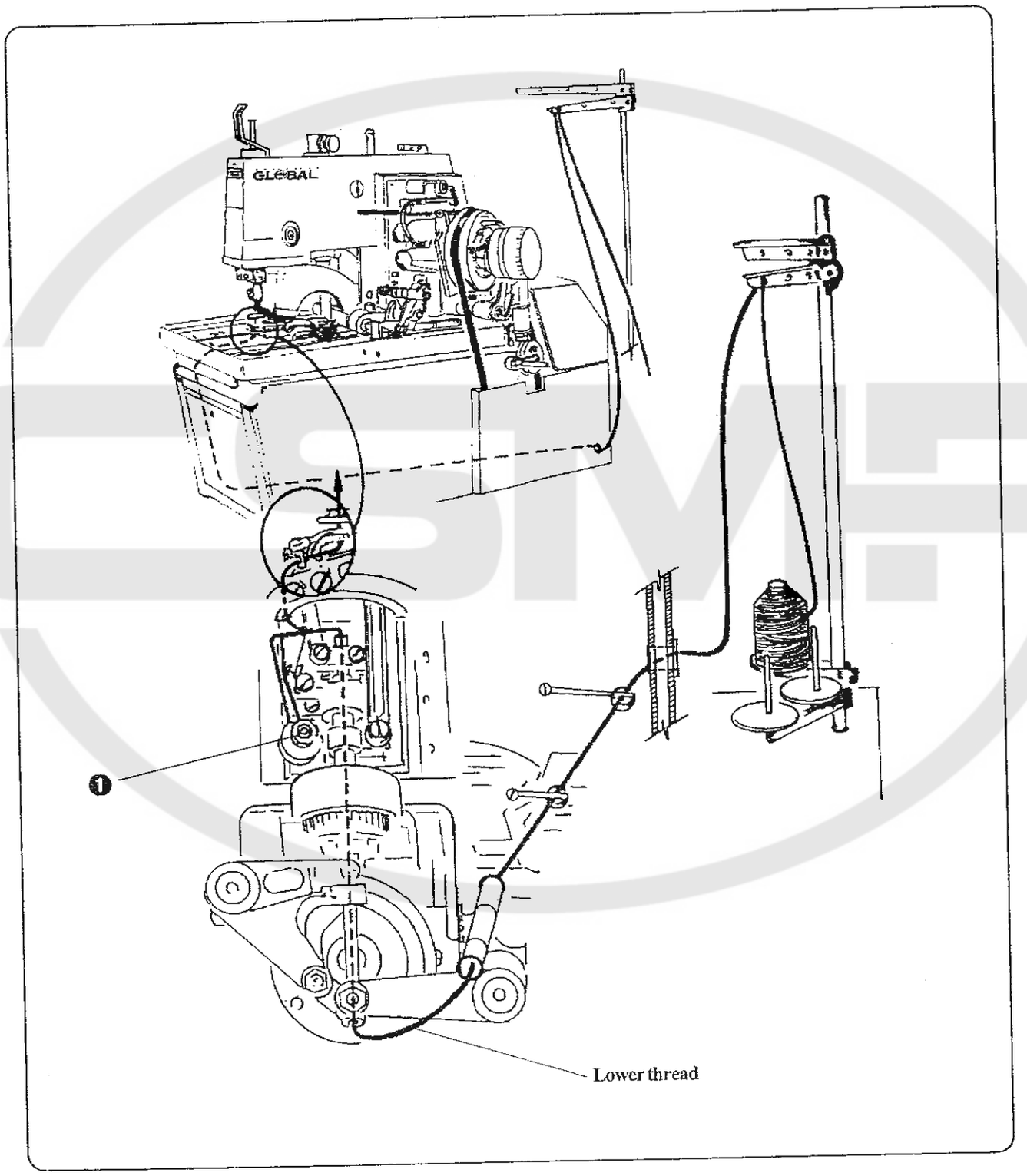
Threading the gimp and upper thread to the machine - BH 1000

To change the upper thread tension, use the nut ❶.



Lower thread

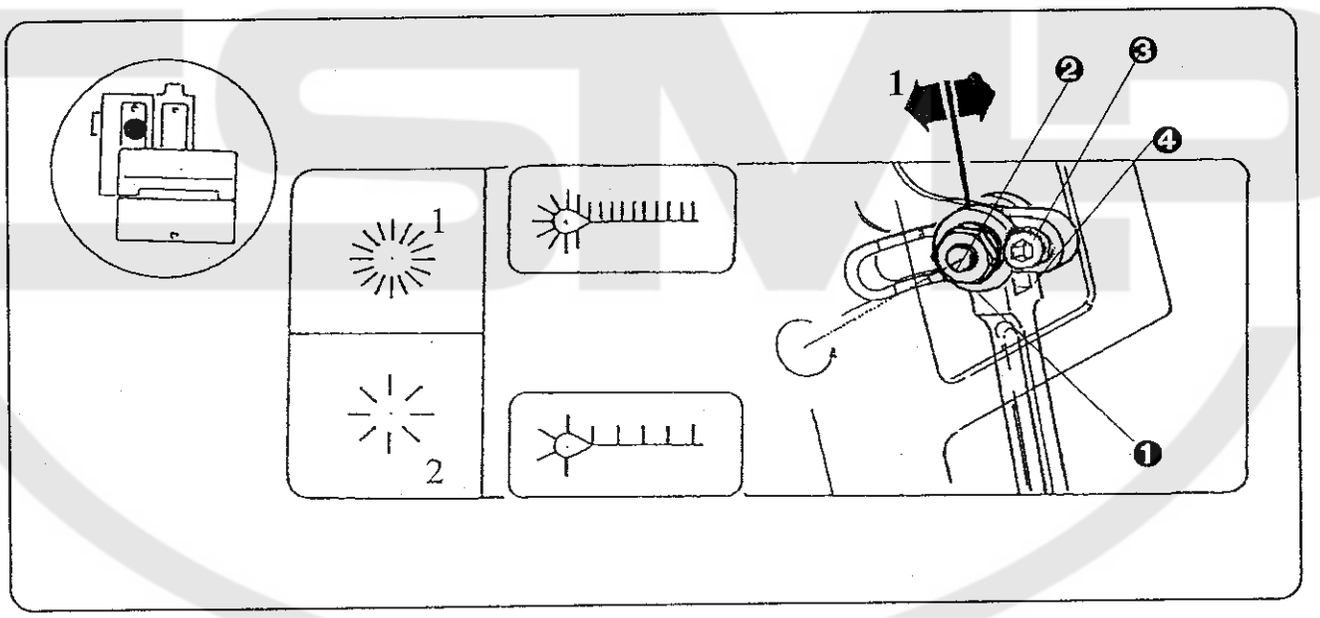
Use the manual nut ❶ to change the lower thread tension.



1. STITCHES DENSITY ADJUSTMENT - STRAIGHT SECTION

1. Remove auxiliary rear cover.
2. Loosen the stud nut ❶.
3. Shift the rod stud ❷ in direction 1 to increase the stitch density, in direction 2 to decrease stitch density.
4. Tighten the nut ❶.

Note: The limiter ❹ is installed on the lever ❸. To obtain the stitch density 8-9 stitches/cm, shift the rod stud ❷ towards the limiter. To decrease the density, remove the limiter ❹.



D - MACHINE ADJUSTMENT

Warning : When the machine is used for long time, the stitch density can be changed because of the running of the main cam brake and main shaft brake. That is why it is necessary to adjust the brakes.

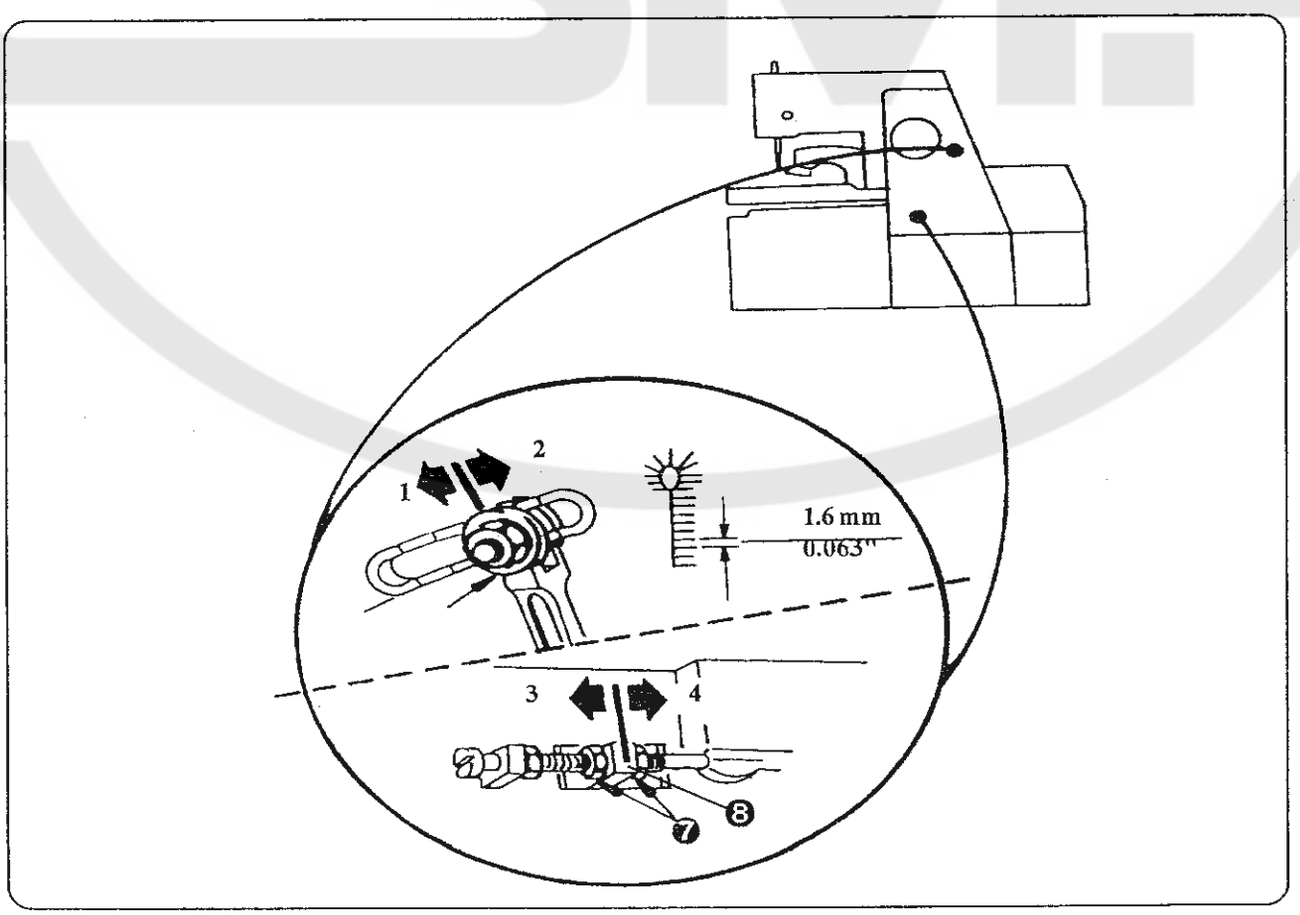
Adjusting main cam brake

The main cam brake controls the density of stitches which is adjust in chapter 2. It is a producer specification for setting the distance between stitches. Under normal use, the brake band will need to be adjusted again. The reason is to run in the brake band:

1. Loosen the locking nuts ❼.
2. By rotating the nuts ❼ is moving the brake band ❽ (in direction 4 to increase the break pressure, move the brake band in direction 3 to decrease the pressure).
3. Tighten the locking nuts ❼.

CAUTION! If the main cam brake pressure is excessively high, the machine may malfunction. The brake pressure is used for easy breaking of the main cam brake, so that the main cam brake is not moving itself by rotary inertia.

HELP: Adjust the stitch density according to the chapter 2 to require density with loosen the brake. Then lightly pull the brake, so that the number of stitches increase maximally to one stitch of length of the buttonhole. This will ensure correct function of the brake.

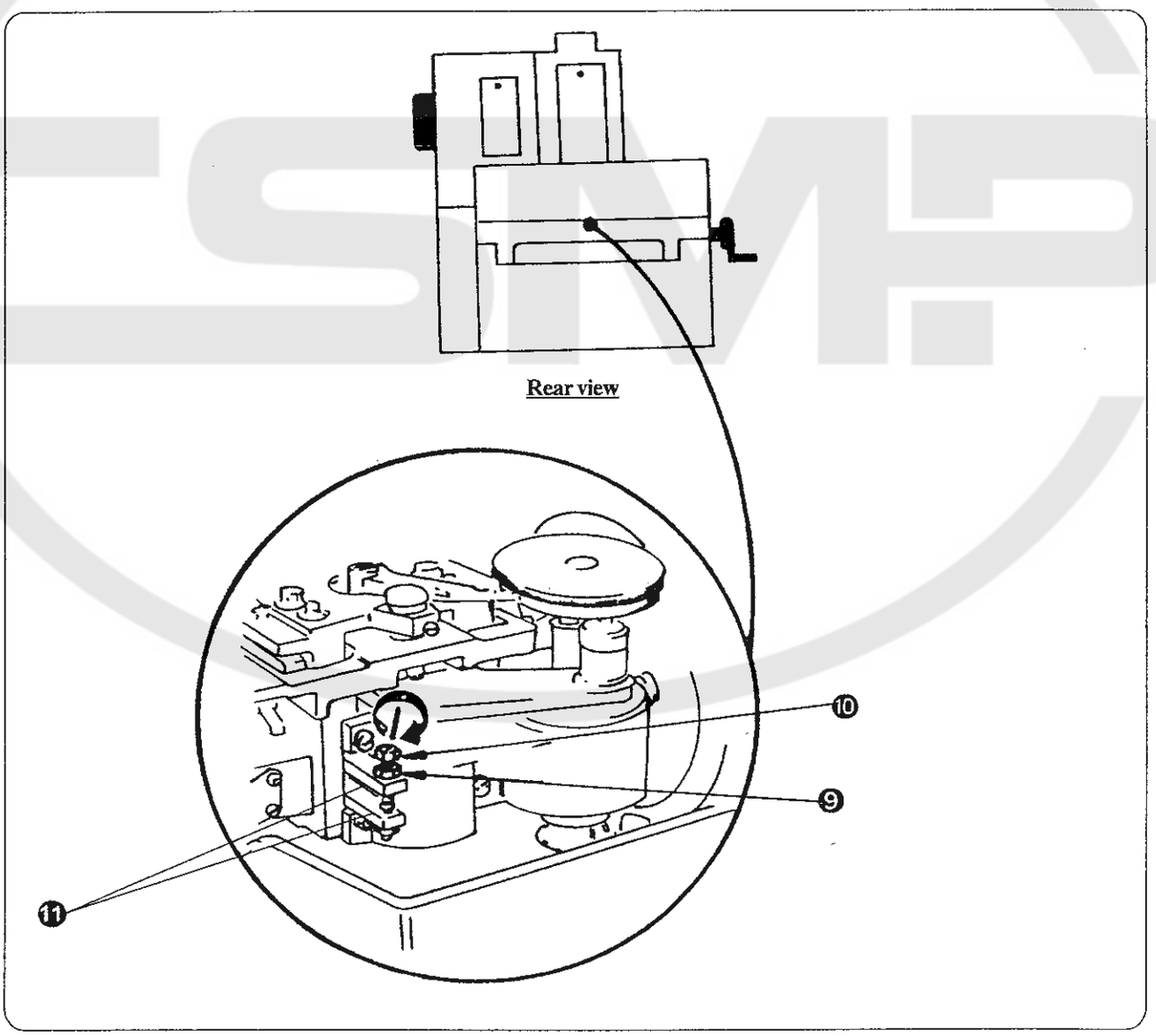


Adjustment of the main shaft brake

The main shaft brake equalizes the stitch density of the buttonhole seam for the left and right-hand sides.

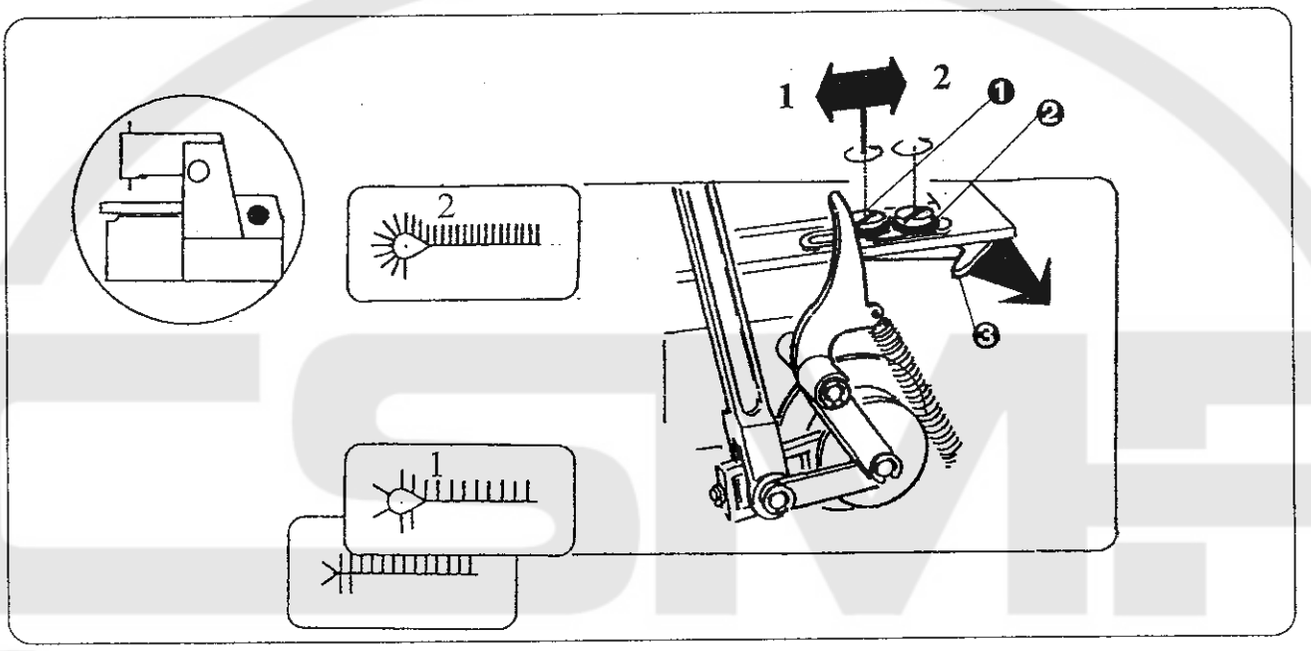
1. Loosen the locking nut ⑨ of the adjustment screw ⑩ in the main shaft brake ⑪.
2. Adjust the brake pressure to obtain equal stitch density between the stitches. Tighten the adjusting screw ⑩. Rotating the adjusting screw clockwise, increases the brake pressure.

CAUTION! The main shaft brake is an auxiliary brake, used to obtain equalization of stitch density on the left and right-hand sides. If the main shaft brake pressure is excessively high, the machine components may malfunction. Adjust the lightest brake pressure as possible.



2. ADJUSTMENT OF THE STITCHES DENSITY IN THE EYE

1. Fold the rear cover.
2. Loosen the screws ❶ and ❷. Move with shim ❸ forward operator and the stitch density will de crease.
3. Tighten the screws ❶ and ❷.



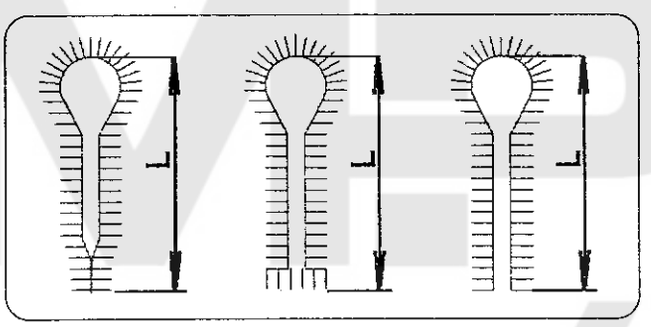
3. LENGTHS OF THE SEWING

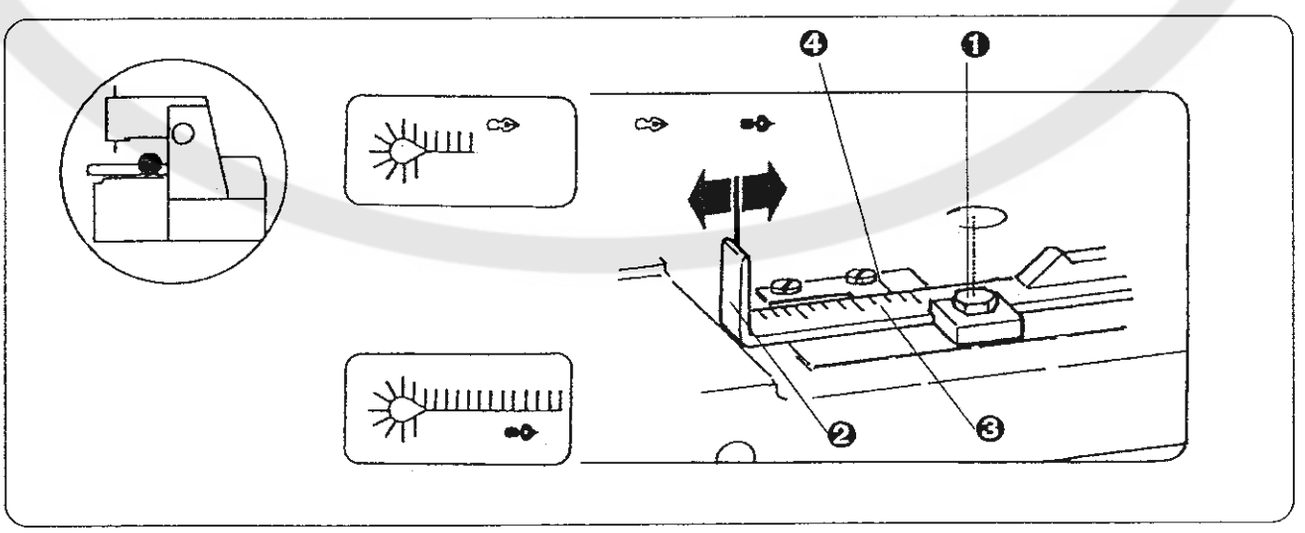
1. Loosen the clamp screw ❶ and move with the rod till ❷, so that the needed sewing length on the dial rod ❸ is covered with the indicator mark ❹.

2. Tighten the screw ❶.

The total length of the sewing **L** was just adjusted - see picture.
Note: The total sewing length is the sum of the: **length of cutting plus the length of the bar**.
If the fly bar sewing is needed, it is necessary to change the length of the shape cam.

WARNING ! When the length of buttonhole is changed, it is necessary to change also the cutting steel with appropriate length.





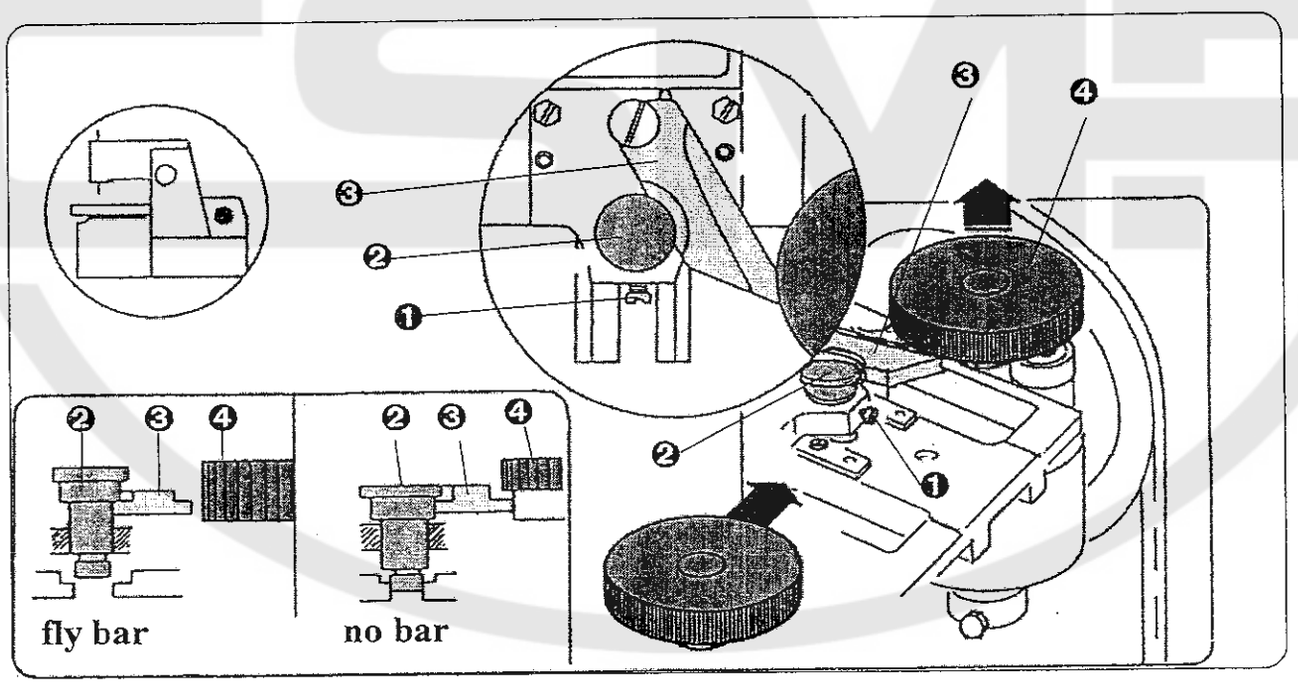
4. CHANGE OF THE BUTTONHOLE SHAPE - CHANGE OF THE LATERAL CAM

Fly bar

1. Loosen the screw ❶.
2. Lift the roll stud ❷, so that the locking lever ❸ allows the insertion of new lateral cam ❹.
3. Tighten the screw

No bar - to adjust the fly bar with open end of the buttonhole, follow this steps:

1. Loosen the screw ❶.
2. Push the roll stud ❷ and insert the cam.
3. Tighten the screw ❶.



D - MACHINE ADJUSTMENT

Supplied lateral cams:

Length	FOR BUTTONHOLES WITHOUT EYE		FOR BUTTONHOLES WITH EYE	
	eye/shape		eye/shape	
13-40	0	17.0067.4.101	3/5	17.0067.4.102
32	0	17.0067.4.145	3/5	17.0067.4.161
29	0	17.0067.4.144	3/5	17.0067.4.160
26	0	17.0067.4.143	3/5	17.0067.4.159
24	0	17.0067.4.142	3/5	17.0067.4.158
22	0	17.0067.4.141	3/5	17.0067.4.157
20	0	17.0067.4.140	3/5	17.0067.4.156
19	0	17.0067.4.139	3/5	17.0067.4.155
18	0	17.0067.4.138	3/5	17.0067.4.154
16	0	17.0067.4.137	3/5	17.0067.4.153
16			* 3/5	17.0067.4.403
14	0	17.0067.4.136	3/5	17.0067.4.152
13	0	17.0067.4.135	3/5	17.0067.4.151
12	0	17.0067.4.134	3/5	17.0067.4.150
10	0	17.0067.4.133		

* Only for order: flybar 7 mm, stitch width 2 mm

WARNING ! When the lateral cam is changed, it is necessary to ensure the adjustment of the correct buttonhole length, and install the correct cutting steel or knife.

5. CHANGE OF THE WIDTH BITE

Can be use for all machine modifications.

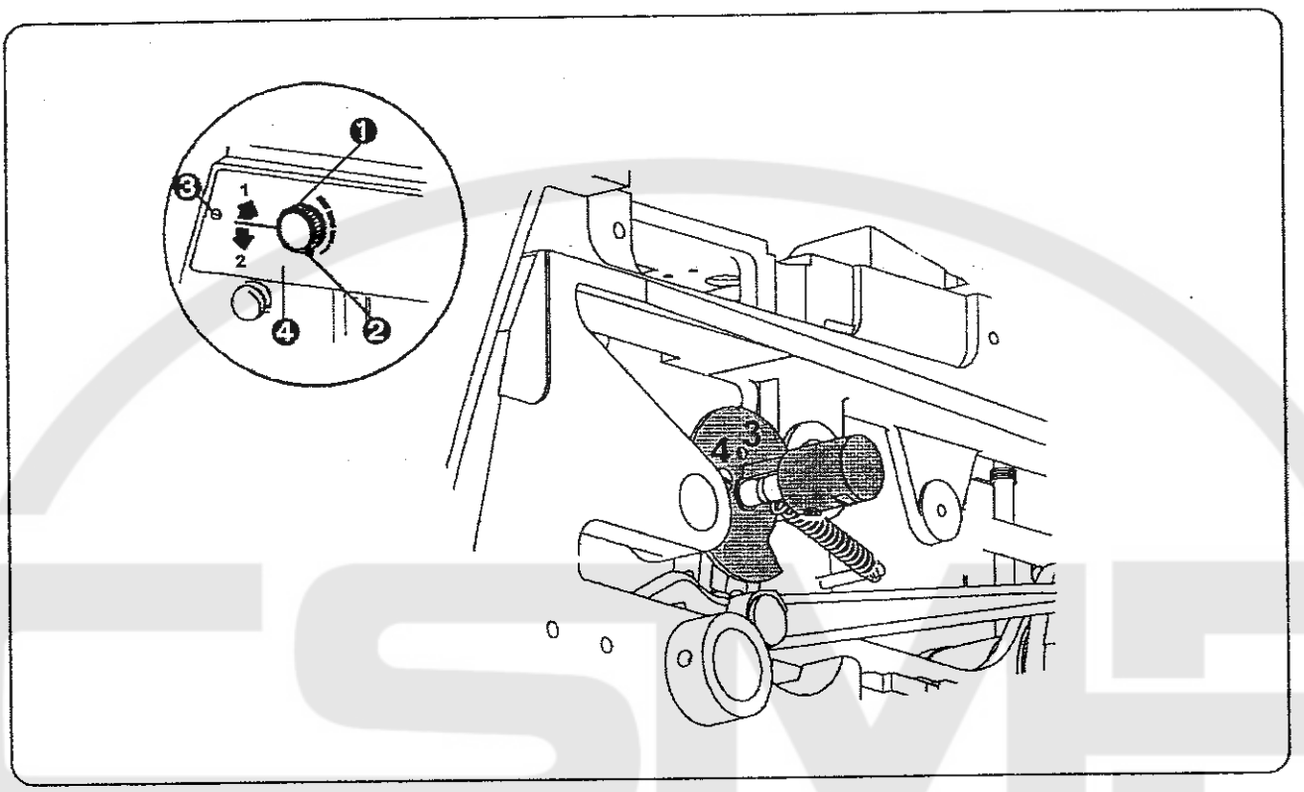
To adjust the width bite turn the button ❶ clockwise the width bite will decrease - see **1.**
By turning the button ❶ counter clockwise, the width bite will increase - see **2.**

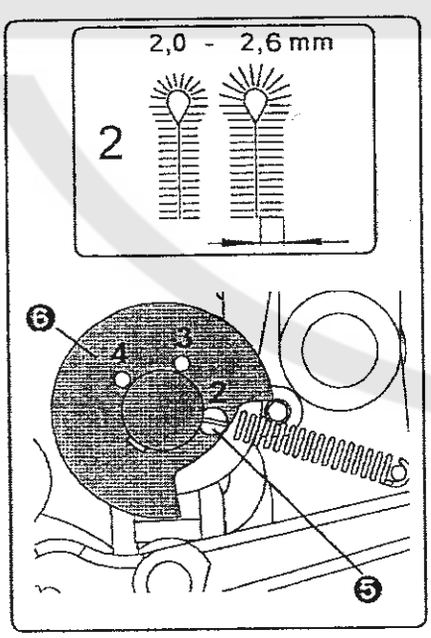
The standard width bite is in range from 2,8 to 3,4 mm (0.110" to 0.134") it is adjusted by the manufacturer.
To change the width bite adjusted by manufacturer, follow this steps:

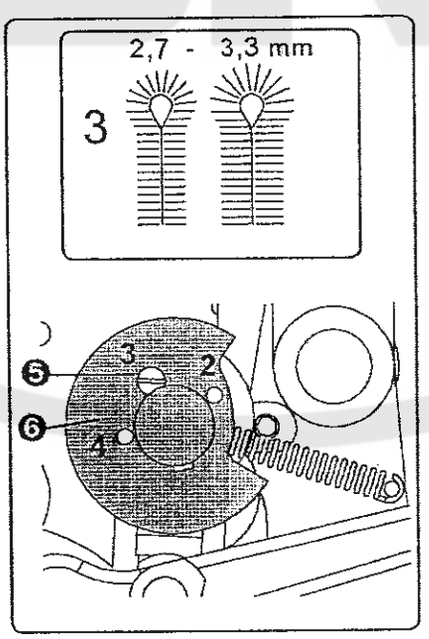
1. Loosen the screw from the button ❷ and remove the adjustable button ❶.
2. Remove the screw ❸, the cover ❹ and also the adjustable screw of the width bite ❺.
3. Rotate with adjustable segment ❻ until the hole determining the width bite is not obtained.
4. Install the adjustable screw ❺ and mount removed parts.

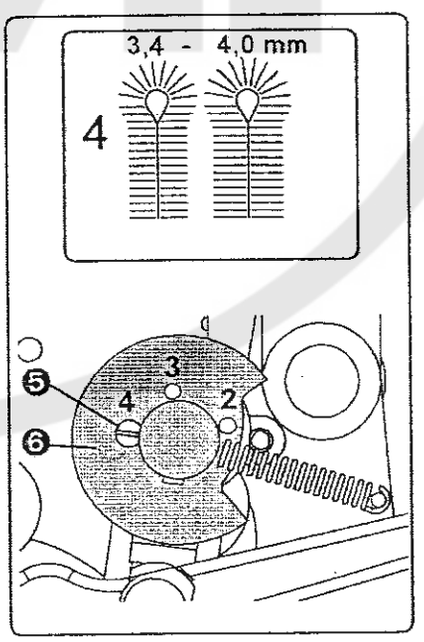
WARNING ! When the width bite is changed, it is necessary to adjust the loopers.

D -MACHINE ADJUSTMENT









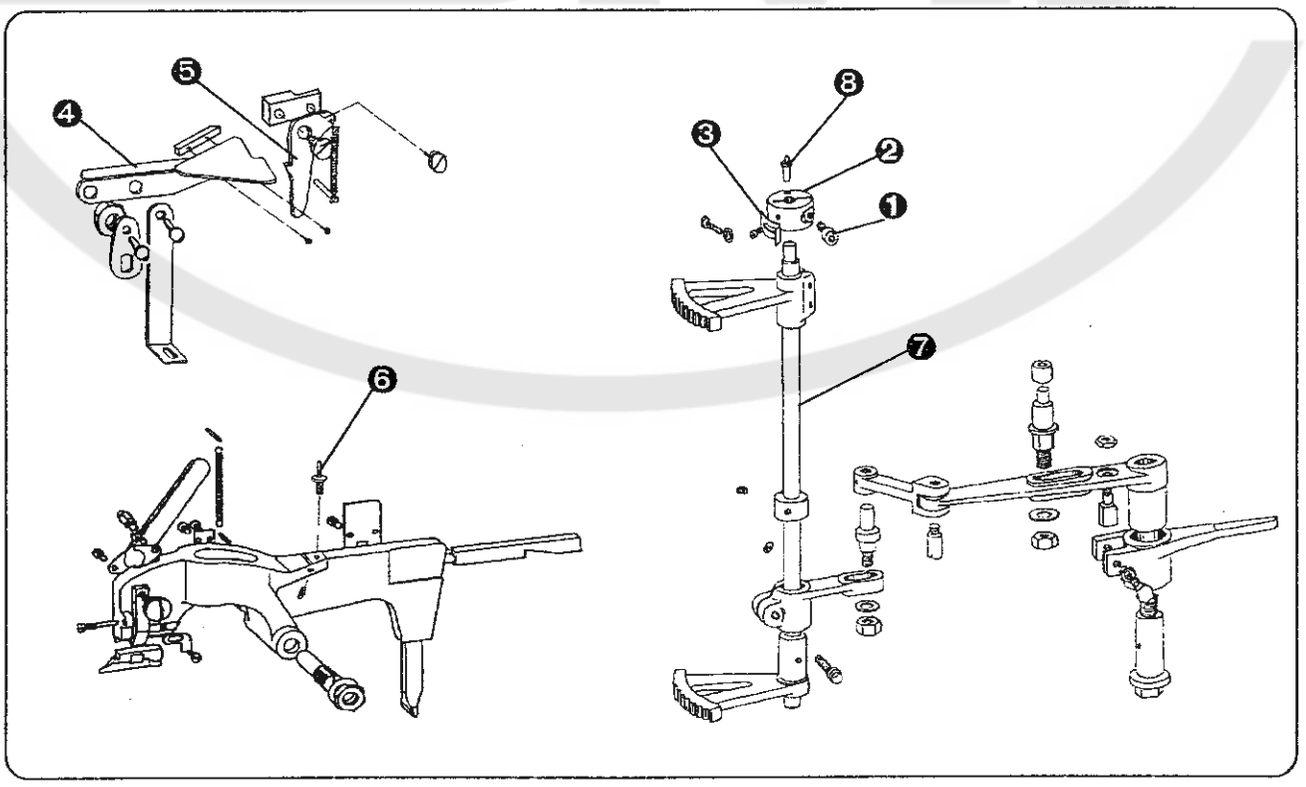
D - MACHINE ADJUSTMENT

Adjustment of the width bite in the cross bar

The cross bar can be narrow down only by maximally 0.6 mm in adjusted width bite;.

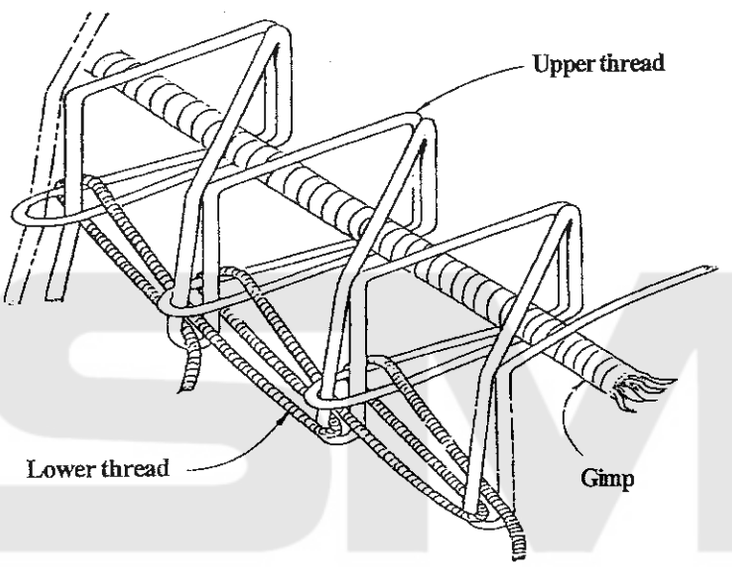
1. Remove the side cover of the head.
2. Check if , is in the moment of maximal pressure during the cutting the bracket ❹ over the tooth on the block ❺. If is not, heave it by screw ❻, so that is maximally 2 mm over the tooth ❺. After turning the mechanism ❼ to the working position, the bracket ❹, must fall to the top of the pivot ❽. After the buttonhole is sewn is the bracket ❹ in the front of the pivot ❽. During the sewing the cross bar, the bite size is decreased.
   If the bracket fall down to the front of the pivot before the sewing first part of the buttonhole, it will occur prematurely decreasing the bite size, in that case, is the table moving minimally and the machine is sewing almost in one place.
3. Loosen the screw ❶, and rotate the ring ❷ to change the bite width in the cross bar (counter clockwise, the bite size increases, clockwise is the bite size decreased - from upper view)
3. Tighten the screw ❶.
4. It is necessary to move the stop ❷ by the same amount of the millimeters as the ring ❸ has been moved, but in the opposite direction.
5. Install the left side cover.

NOTE : This width is adjusted from the manufacturer and it is not necessary to adjust it again.



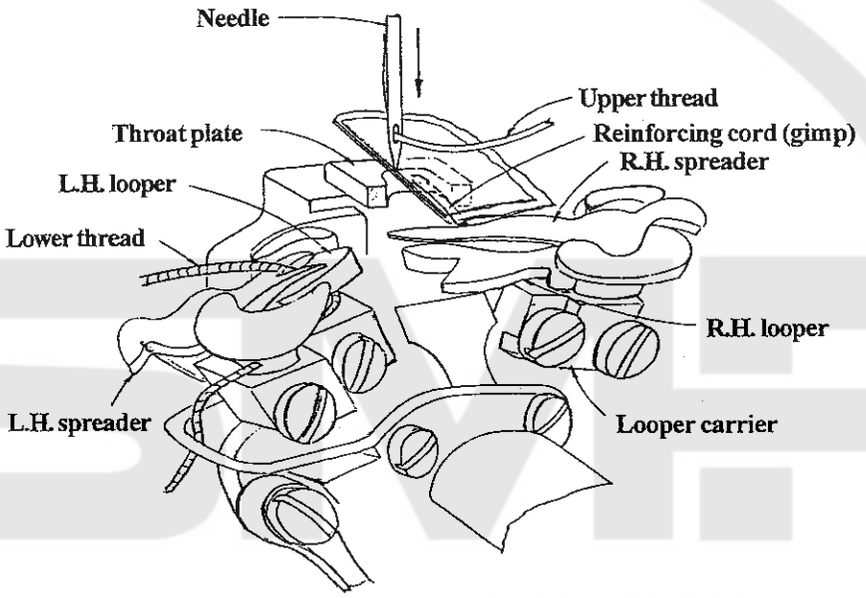
6. PRINCIPLES OF SEWING

BH 1000 machine, sews two-thread, chain stitches with possibility to insert the gimp.

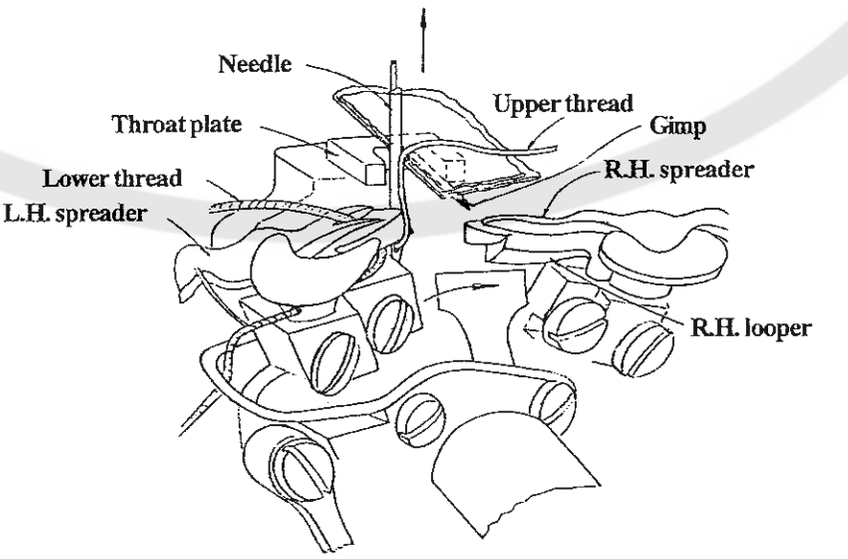


D - MACHINE ADJUSTMENT

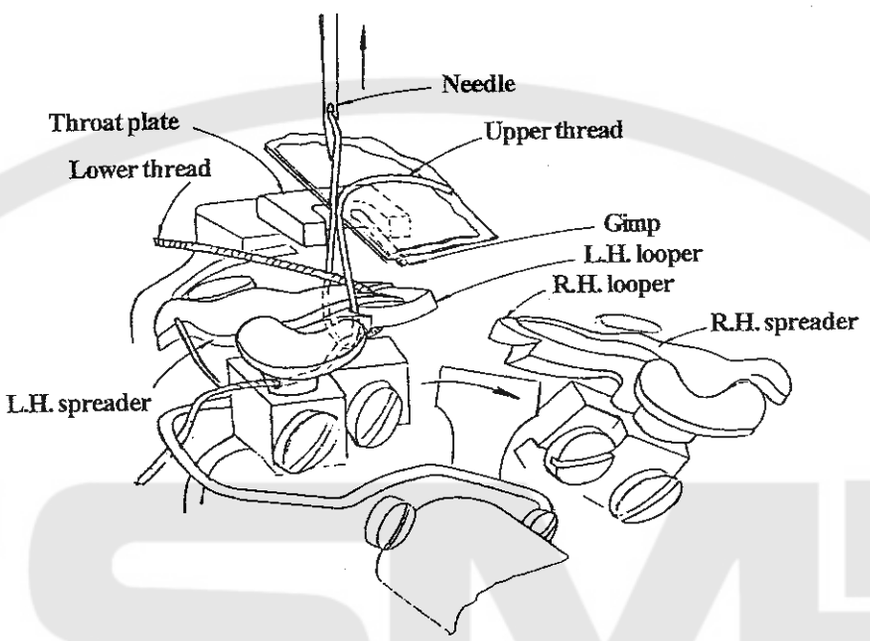
A stitch is the unit of thread formed in the production of seams and stitching.
Stitching is defined as a series of stitches embodied in a material for ornamental purposes, for finishing an edge, or both.
The type of stitch used in the eyelet buttonhole machine is a 401 stitch, two-thread, chain lock, purl stitch enveloping a reinforcing cord. When the thread, loopers, and spreaders create a buttonhole:



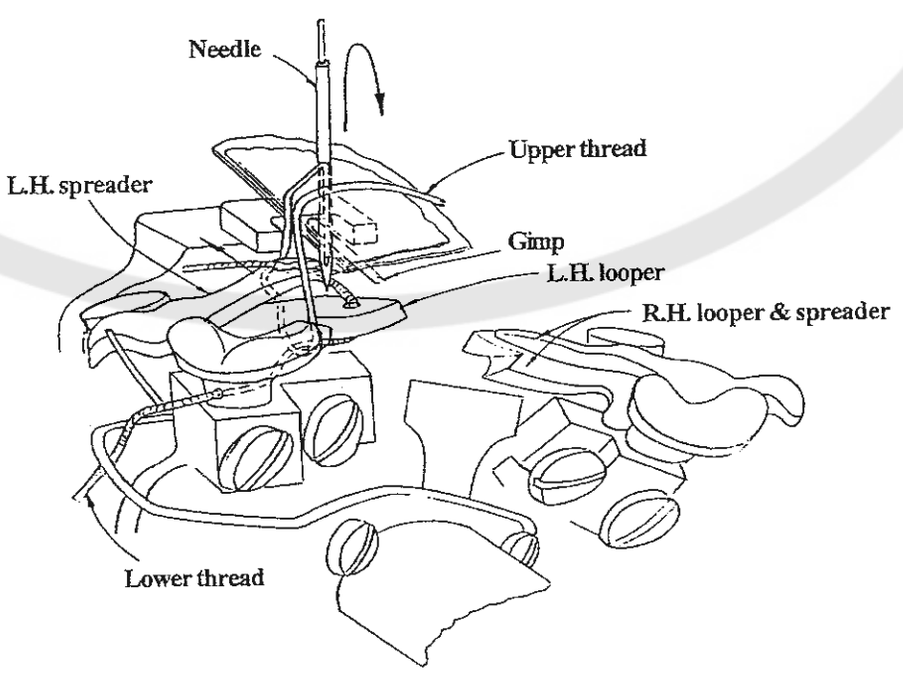
A loop is formed when the needle rises. The looper carrier moves to the right and the left-hand looper enters the formed loop.



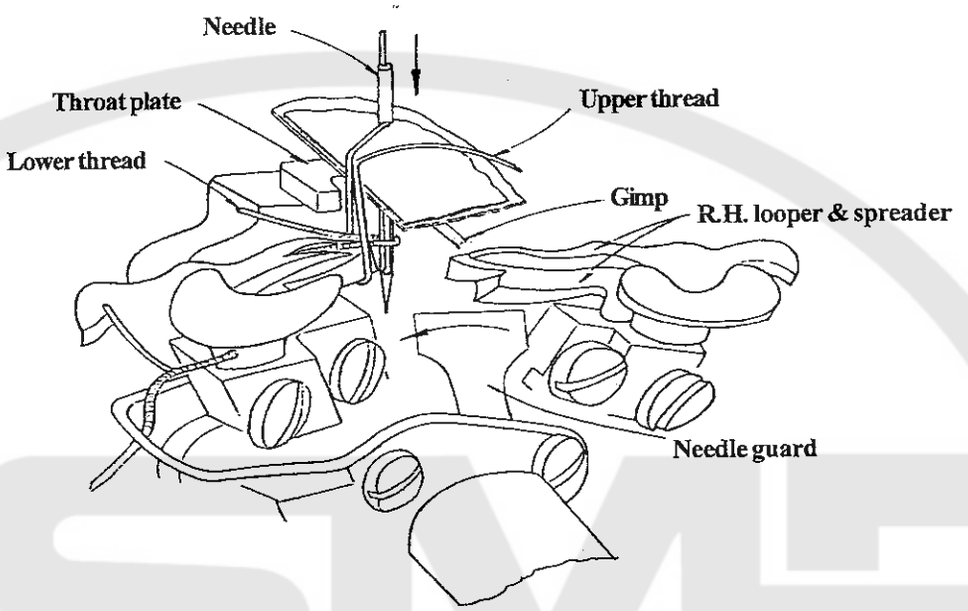
The looper carrier continues moving to the right, carrying the lower thread, the left-hand looper, and the spreader, fully enter the formed loop.



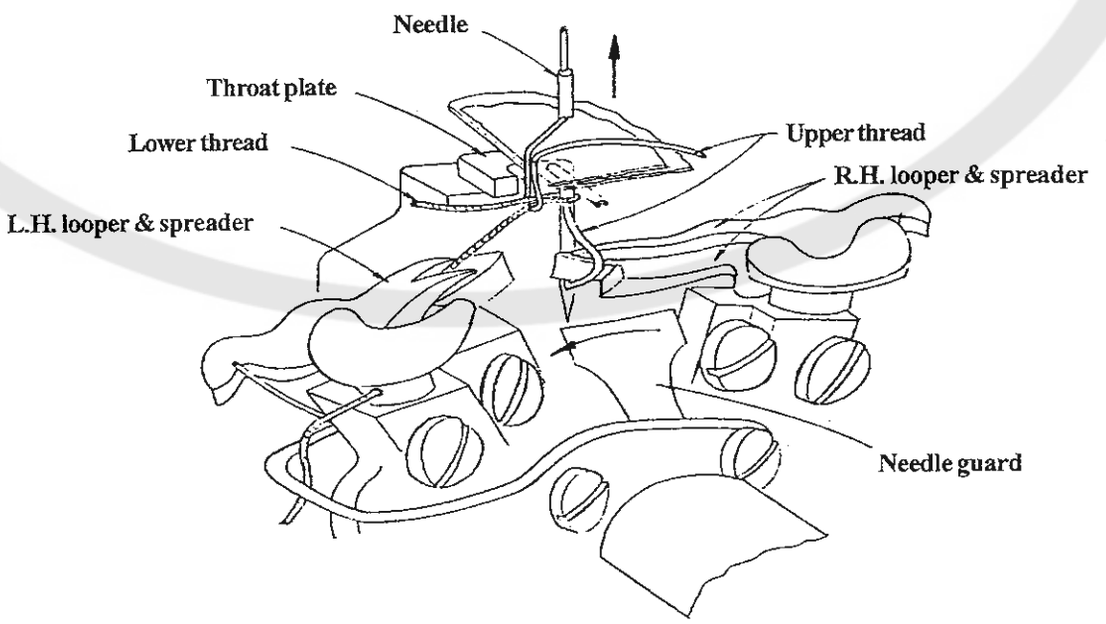
The left-hand spreader opens, making room for the needle to pass through a loop formed by the lower thread. With this penetration, the needle encompasses the cord.



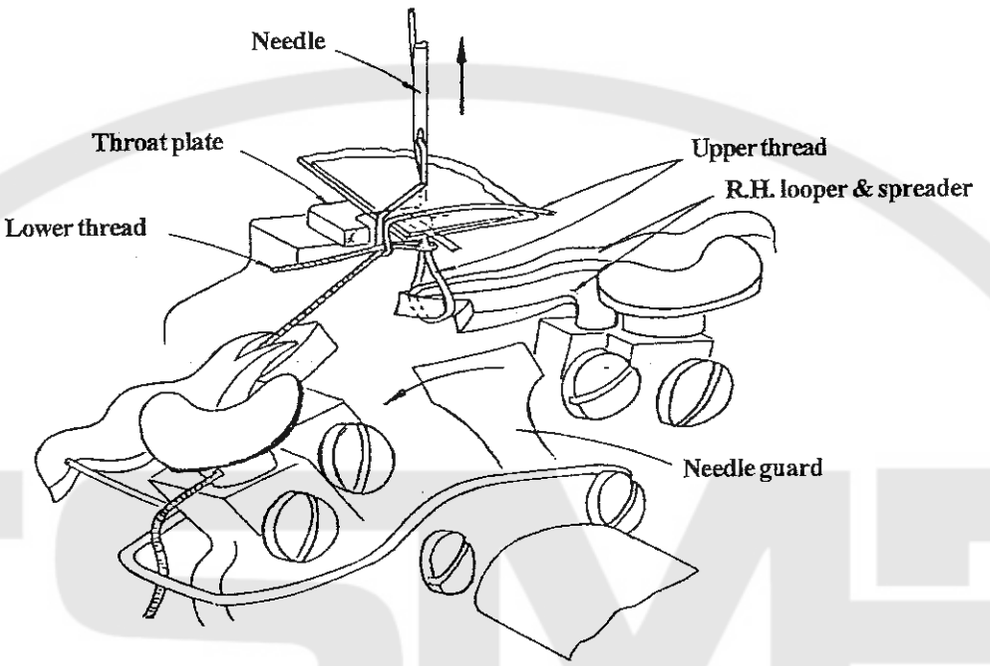
As the needle moves down to form a new loop, a take-up implement pulls the upper thread up into the material, and brings the lower thread with it.



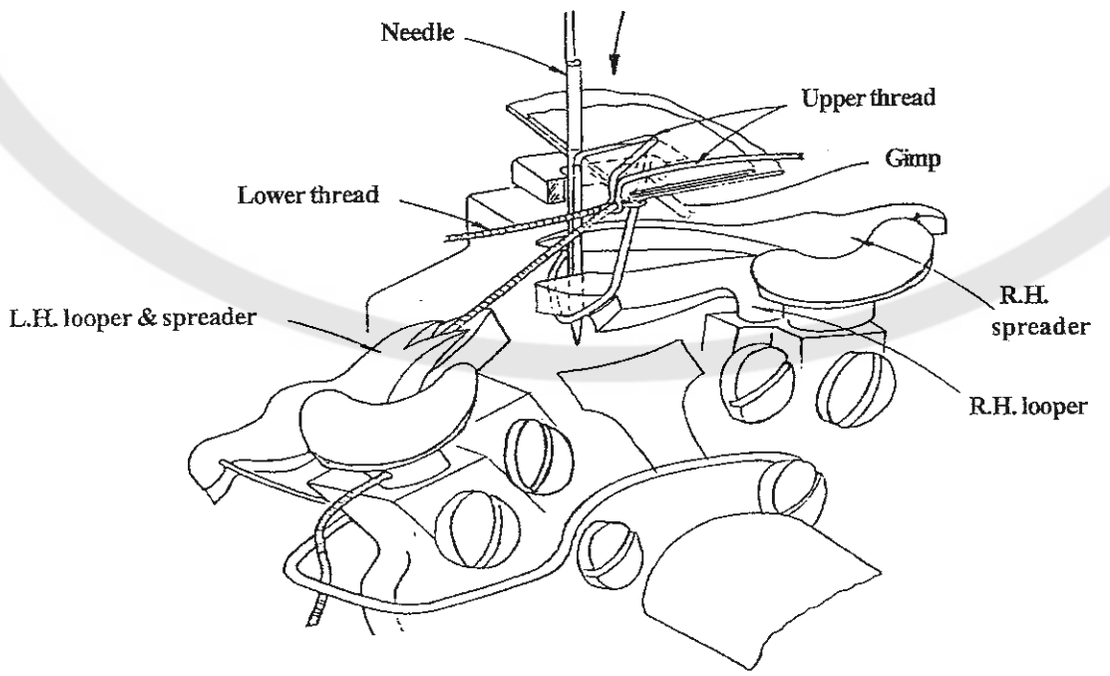
A loop is formed as the needle rises. The looper carrier continues moving to the left and the right-hand looper, enter the new loop formed. The previous loop is pulled up tight against the material.



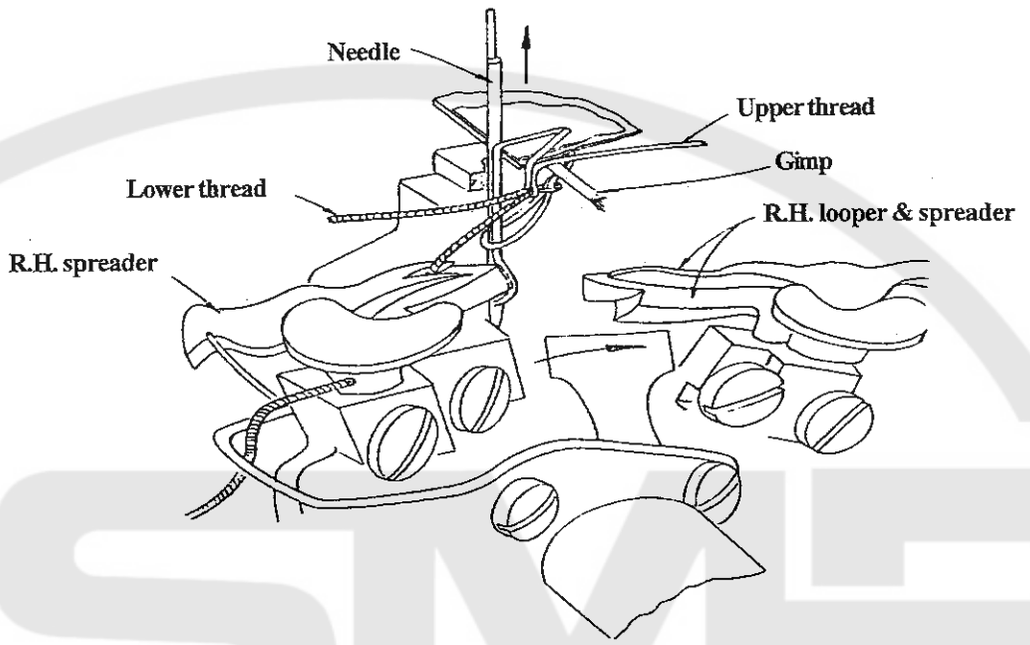
The looper carrier continues moving to the left. The right-hand looper and spreader fully enter the formed loop.



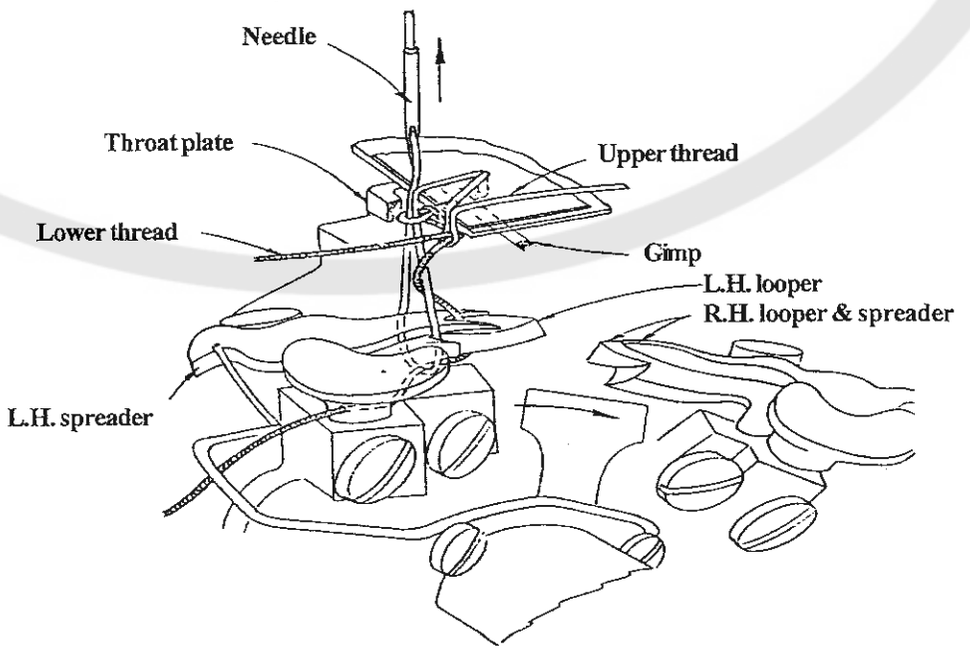
The right-hand spreader opens, making room for the needle to pass through a loop formed by the upper thread.



The looper carrier moves to the right as the needle "strips" the loop previously formed. The left-hand looper enters the new loop which is being formed.



The lower thread forms a purl as it, and the previously formed thread loop, are pulled up against the material. The enveloped cord provides the buttonholes with body.

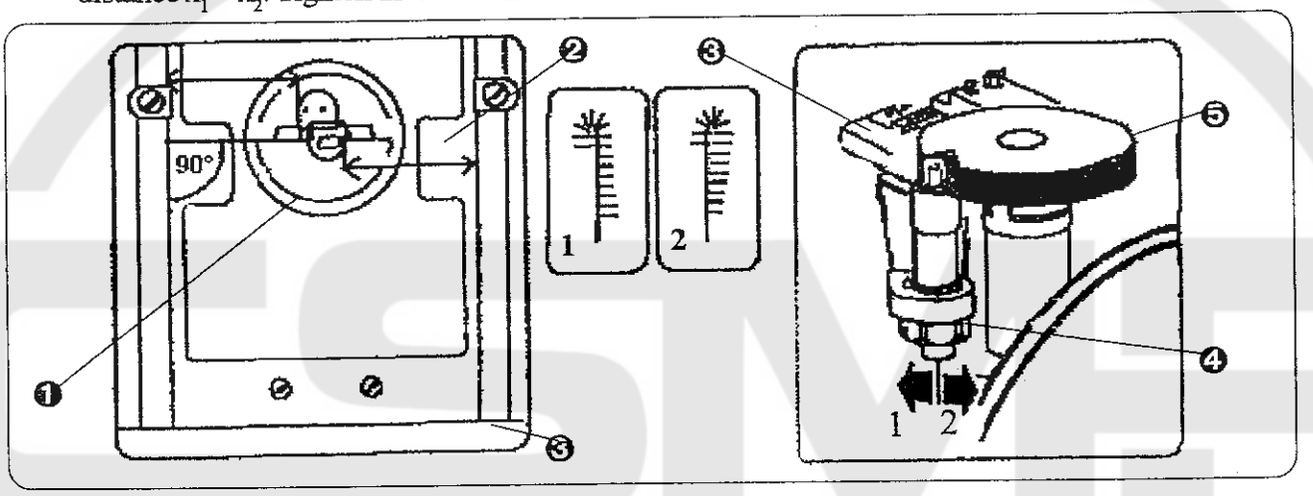


D - MACHINE ADJUSTMENT

7. BED PLATE ALIGNMENT

Make the adjustment with the lateral cam for sewing of the buttonhole without eye and without flybar.

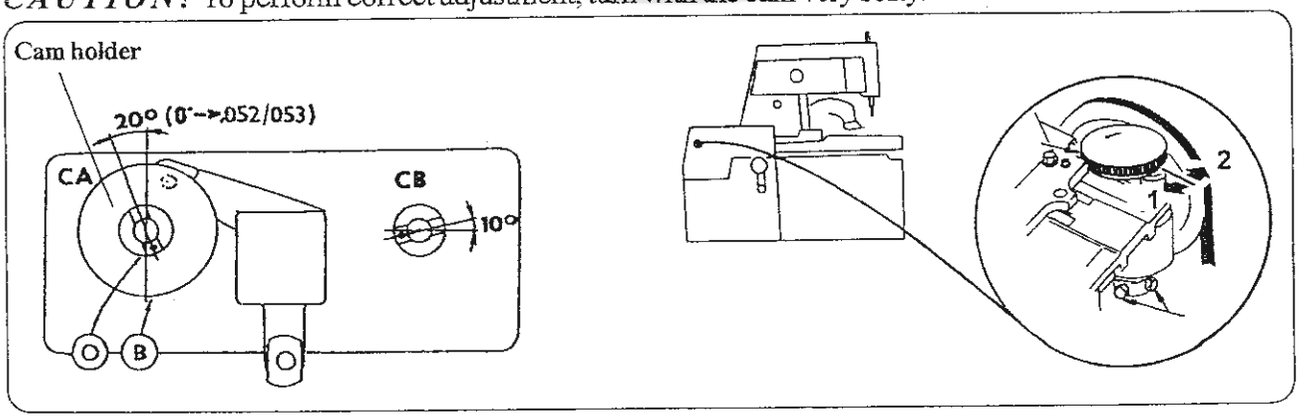
1. Remove feet plates and instead of stitching plate install support of the gauge ❶ from accessories.
2. Turn by the handle and stop the machine approximately in the middle of the table protrusion ❷. Measured distance between support of the gauge ❶ and the table slat ❸ on the right side has to be the same as distance between support of the gauge and table slat on the left side after moving to the same place after race turning.
3. Possible difference adjust after loosing the nut stud ❹ of the cam ❺ by its shifting to reach identical distance $x_1 = x_2$. Tighten the nut well.



8. SETTING OF THE CAM POSITION

In home position of the machine, during cutting after, adjust the position of the cam holder, so that locating pin points obliquely towards operators.
Loosen adjusting screws on the shaft in teething of the cam and turn with the cam. By this will be change the buttonhole eye shape. Tighten adjusting screws.
Remove cutting knife and take the thread out of the machine. Insert the paper under clamp feet and without thread sew the buttonhole on the paper for check. If the eye shape looks like picture **1** below, turn the cam in direction **2.** If the eye shape looks like picture **2** down, turn the cam in direction **1**.

CAUTION! To perform correct adjustment, turn with the cam very softy.



9. TURNING MECHANISM

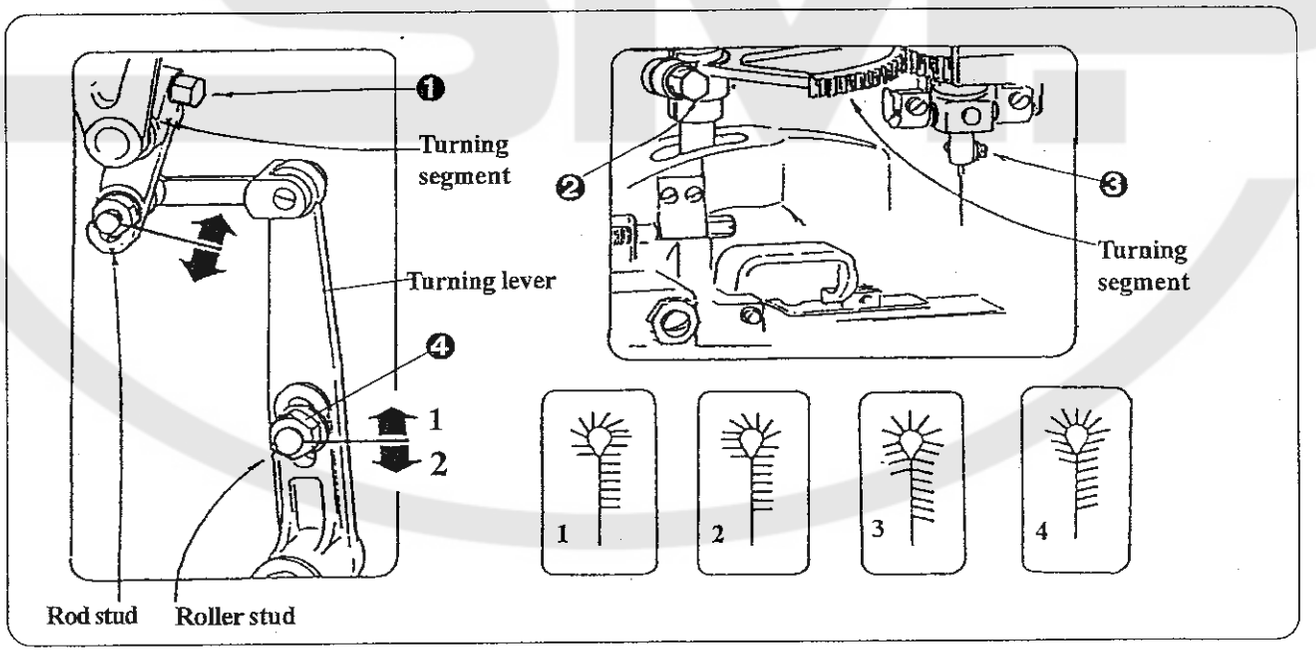
WARNING ! This adjustment can be performed only by well trained mechanic.

If the stitches are not vertical to the catted hole, it is necessary to adjust the turning mechanism:

1. The machine must be in home position.
2. Loosen the screw ❶ and adjust the looper holder, so that the looper holder is vertical to the length ways axis of the table. Tighten the screw ❶.
3. Loosen the screw ❷ and adjust the needle bar so that tension discs ❸ are in direction towards the operator. Tighten the screw ❷.

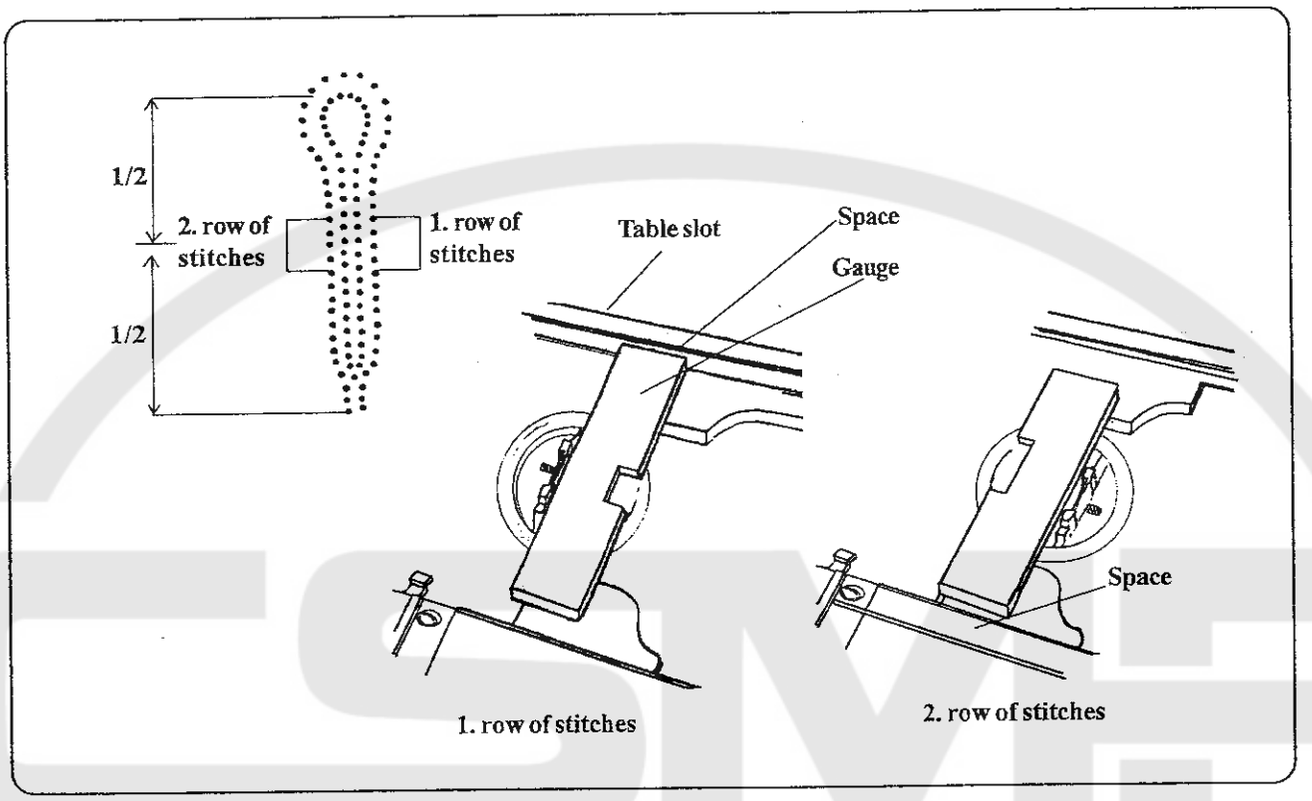
If the stitches are not in direction to the centre of the eye, follow this steps:

1. Lift the machine head.
2. Loosen the nut on the roller stud ❹ of the turn lover according to the necessity. By moving down direction **2**, turning starts earlier and by moving up direction **1**, turning starts later. Tighten the nut stud ❹.



Check the correct position by means of the enclosed gauge from accessories.
Give down the machine head. Remove the stitching plate. By turning the handle on the machine left side, go with the table to the half of the sewn buttonhole in the first row of stitches.

D - MACHINE ADJUSTMENT



Give straight edge of the gauge over front edge of the supporting surface of the loopers. Check the space between the gauge and the table slat.

By turning of the handle on the left side of the machine, go with the table to half of the second row of the stitches.

Check the distance between gauge and the left table slat again.
The position is correct, if there is no clearance between the gauge and the straight edge - the edge is parallel to the table slat.

If not, modify the turning of the sewing mechanism by 180 ° ± 2° so that after machine lifting, loosen the nut stud of the rod and shift until tilt between the gauge and the table slat is decreased to the half. Tighten the nut.

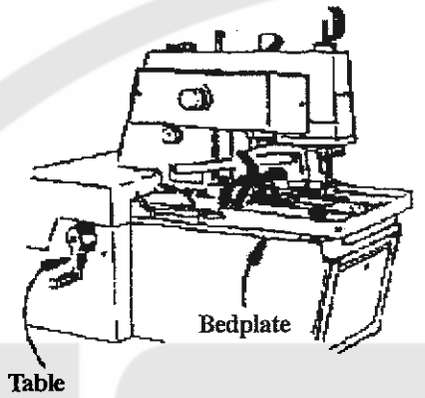
During the stud movement towards **3**, increase the rotation angle of sewing mechanism , towards **4**, the turning angle decreases.

Normally, this adjustment is pursued several times until you reach correct adjustment.

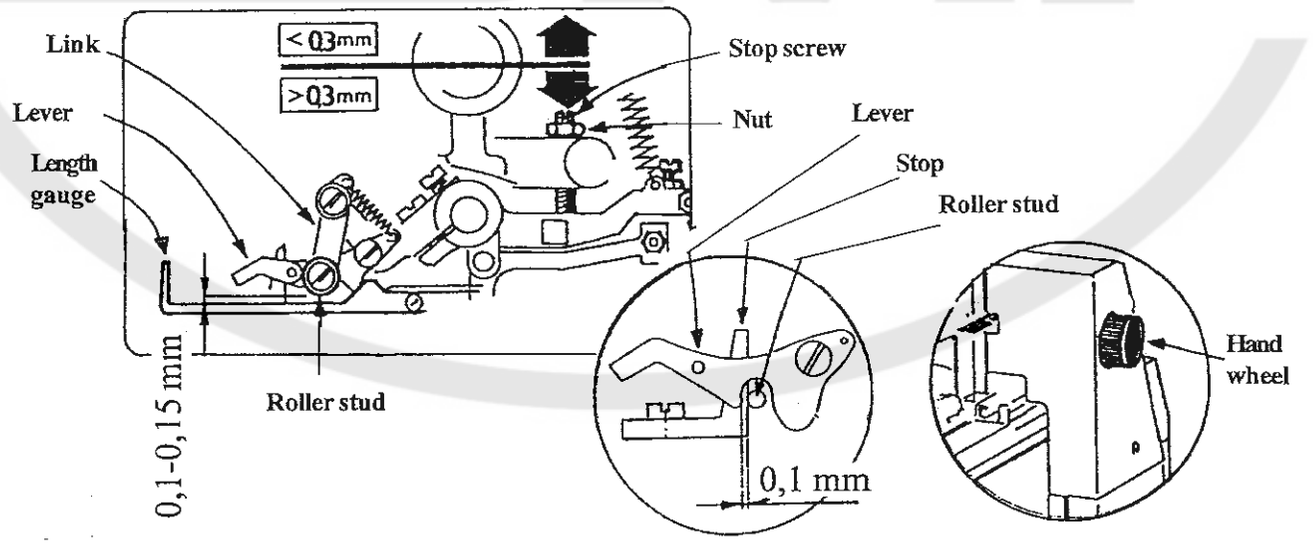
10. STOPPING MECHANISM

WARNING! Switch off the main power to prevent accidental engagement of the machine.

Rotate the handle until the machine is in the home position. In the home position, the bedplate no longer moves to the rear. This adjustment is pursued when cutting after - CA is adjusted.
Rotate the hand wheel until stopping mechanism locks the movement of the sewing drive.

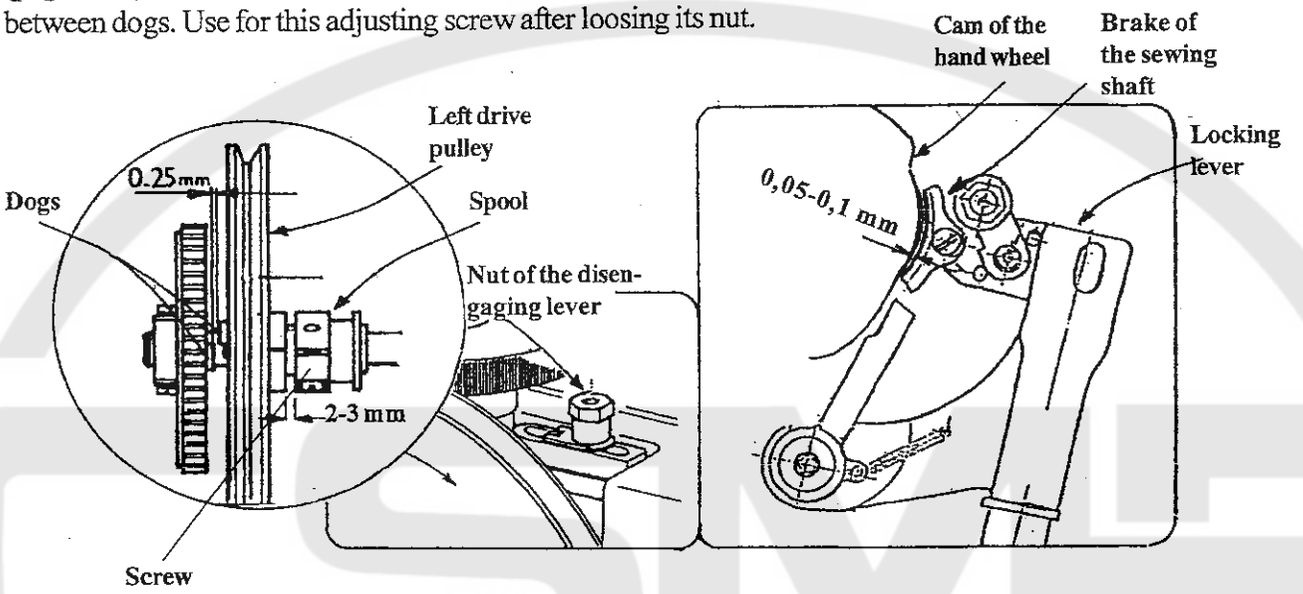


Push the link back. The lever must latch over the roller stud. After loosing the nut adjust by the stop screw clearance 0,1 - 0,15 mm (0.0039 - 0.0059") between roller and length gauge. Then setup stop to the roller stud with clearance min. 0,1 mm (0.0039").

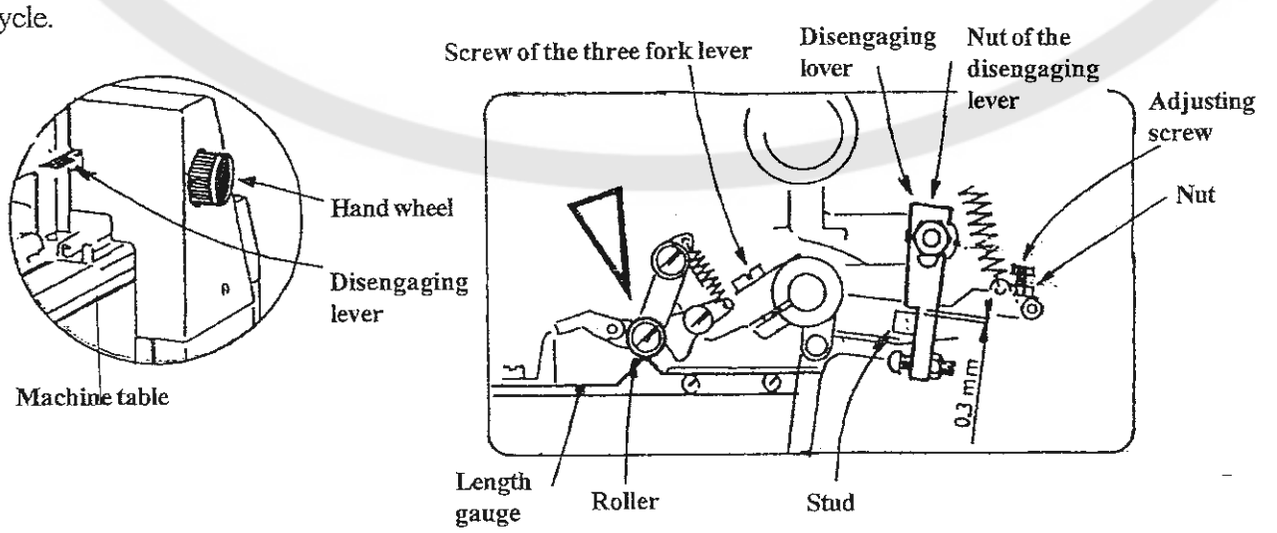


D - MACHINE ADJUSTMENT

The clearance between the brake shaft and the cam of the hand wheel should be 0,05 - 0,10 mm, (0.002" - 0.004"). It can be adjust after loosing the screw of the three fork lever (below). Pull up the locking lever forward.
In the lowest place of the cam of the hand wheel, after clearance adjustment, tighten the screw.
Adjust the clearance between left drive pulley and spool to 2 - 3 mm. (0.078" - 0.118")". Turn the handle (page 1-34) till the shaft of the hand wheel is loosen and adjust the clearance min. 0,25 mm, (0.098") between dogs. Use for this adjusting screw after loosing its nut.



By turning the hand wheel and when the roller is in the highest position of the length gauge, adjust the clearance 0,1 - 0,2 mm (0.004" - 0.008") between the stud and disengaging lever after loosing the nut of this lever. Tighten the nut well.
Turn the hand wheel till the roller is out of the highest position of the length gauge. Push the disengaging lever. In this moment during the turning the hand wheel anti-clockwise, the brake is in contact with travel of the hand wheel. The clearance between the dogs must be at least 0,25 mm (0.098") or more.
By handle move with the machine table to the end position. Adjust the clearance between the dogs after nut loosing to 0,25 mm (0.098") or more. Switch on the main power (circuit breaker) and test the machine cycle.

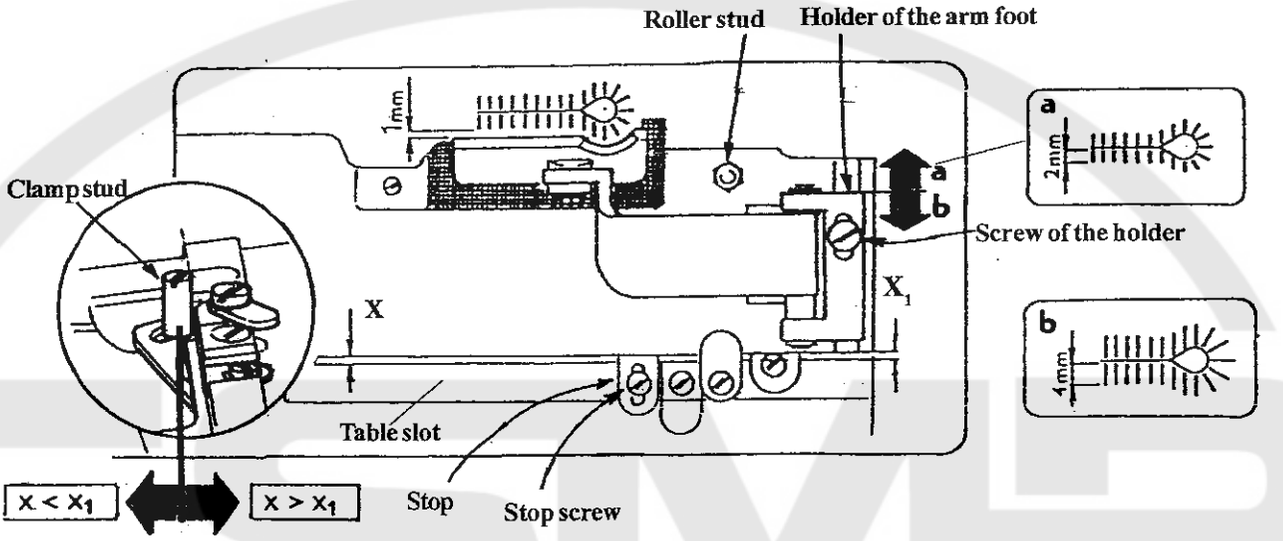


Note: Normally, this adjustment is pursued several times until you reach correct adjustment.

D - MACHINE ADJUSTMENT

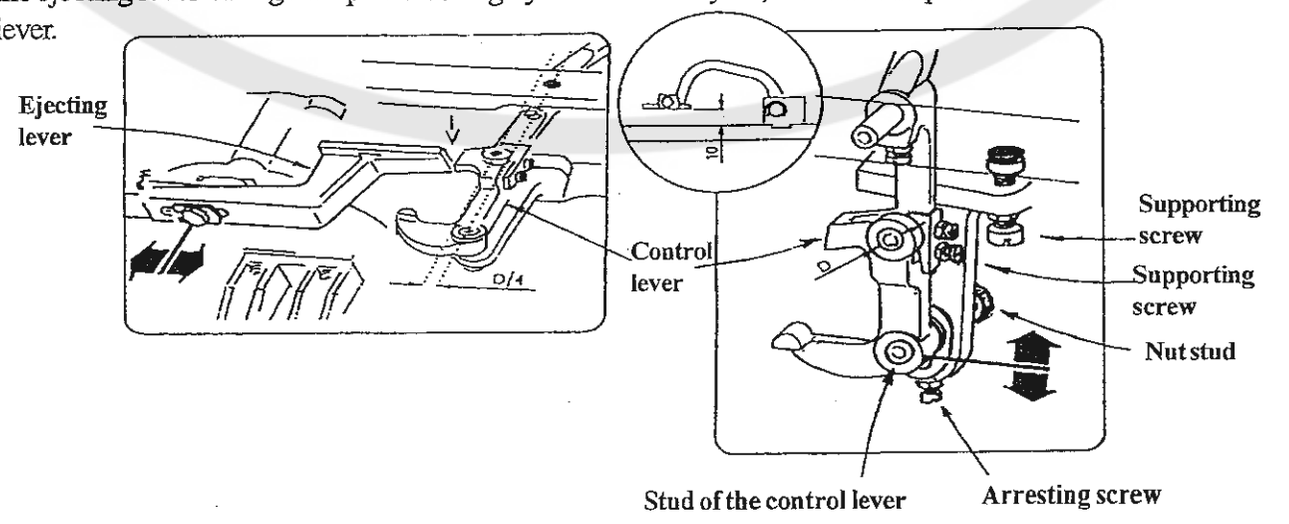
11. SETTING-UP OF THE MECHANISM FOR FABRIC CLAMPING

Basic position of the feet plates with the feet is possible to adjust in position, when by turning the hand wheel the rollers are on the spreader block of the knife holder (picture, page 1-37) and feet plates are opened. After stop screws loosing is possible to adjust the stops. The space X between the table slat and feet plate should be identical by both plates (approximately 0,8 mm, 0.031"). It is reached after setting the space by first foot plate, and loosening its screw and pushing the second stop, so that the plates are leaned on stops. Parallelism of the plates, adjust by shifting of the clamp stud for $x = x_1$.



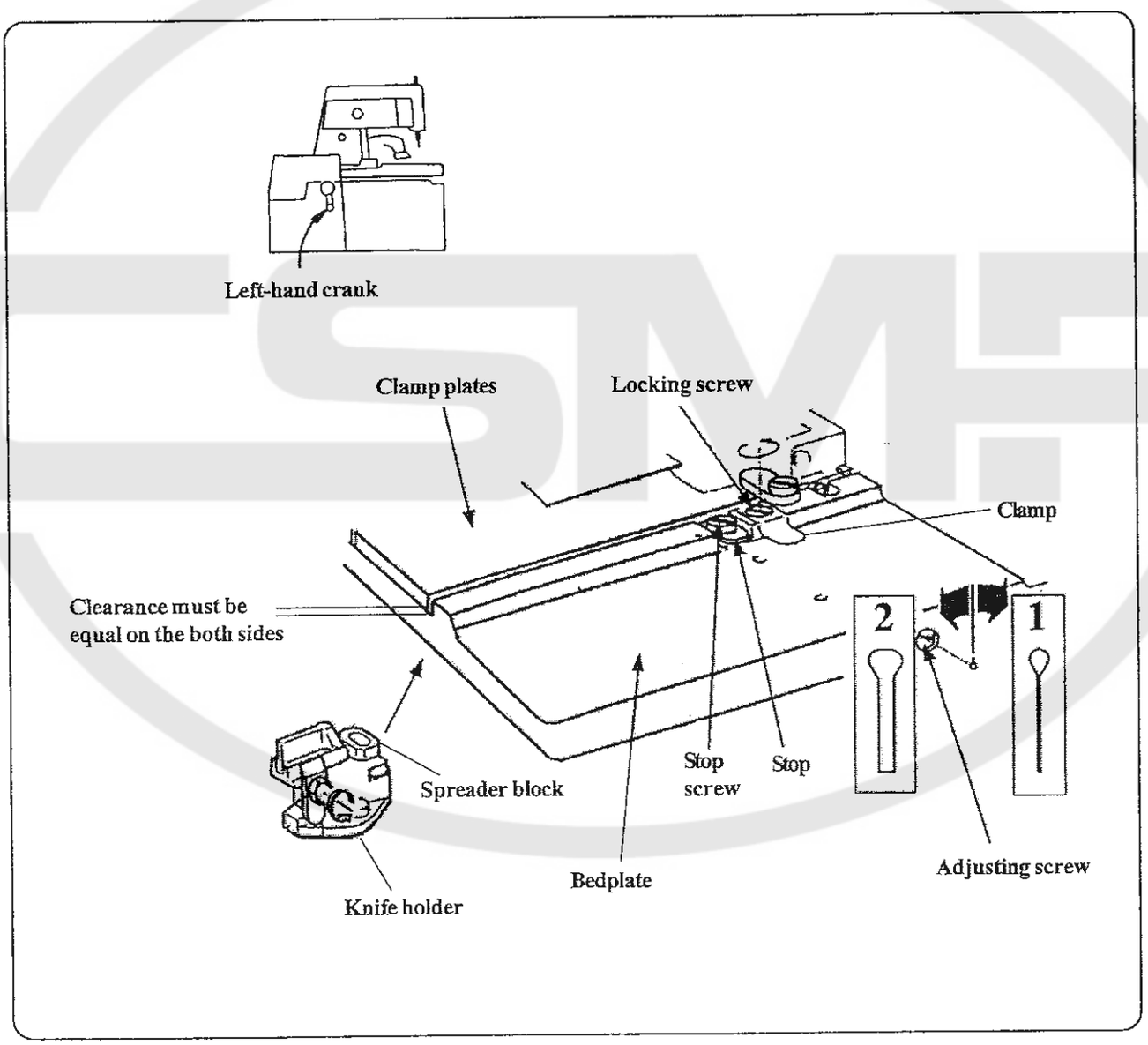
The standard clearance between the clamp feet and the needle surface is 1 mm. To change the standard bite size (2,8 - 3,4 mm, 0.110" - 0.134"), to bite 2,0 - 2,8, (0.078" - 0.110") or 3,4 - 4,0 mm, (0.134" - 0.157"), loosen the screw of the holder and adjust the needed clearance by shifting the holder of the arm foot. The clamp feet are set by manufacturer for medium/heavy weight materials. The construction of the spring-loaded drive levers allows to sew wide range of the fabric thickness. For sewing of the thin fabrics is possible to adjust the press by shifting the stud of the control lever after loosing its nut. Ensure the set position by arresting screw.

Standardly set height of the clamp feet 10 mm (0.393") is possible to adjust by screw of the support. The needed overtravel to cca 1/4 of diameter of the stud (D/4), adjust by supporting screw. After swinging of the ejecting lever during clamp feet closing by the machine cycle, must its end pass the tooth of the control lever.



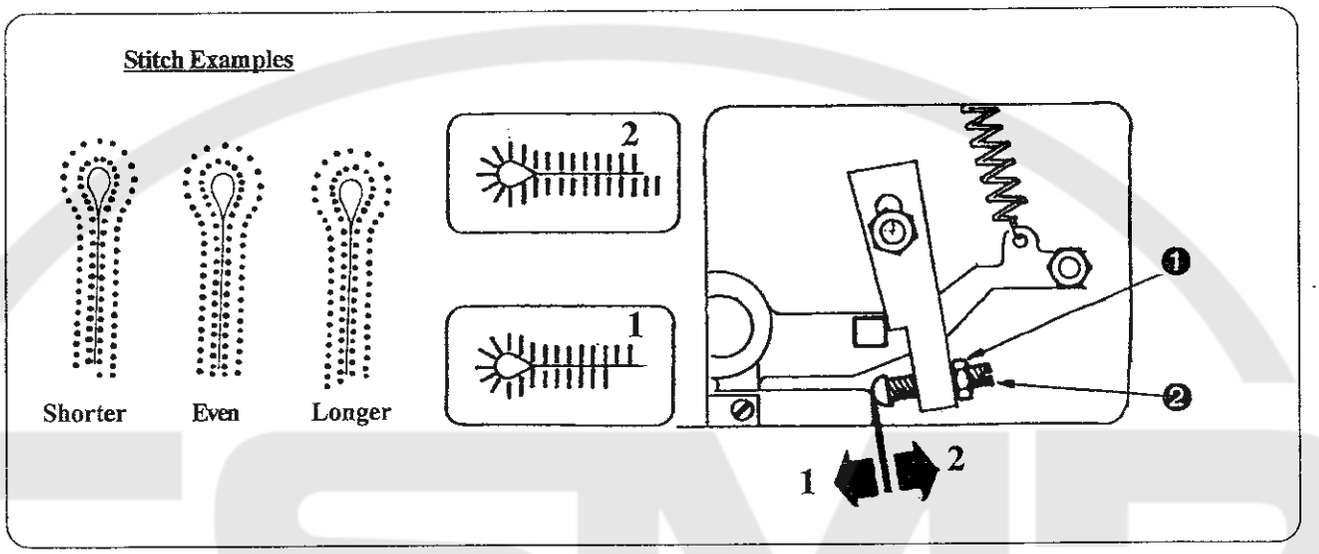
12. CLAMP PLATE SPREADING

The amount of spread distance is determined by the sewing application. Loose fabric (especially thin) should cause stitches missing.
Rotate the left-handle until the clamp plate rollers are positioned to the widest part of the spreader block..
After loosing the locking screw of the clamp, change the spreading size by the adjusting screw.
For denim, the producer recommends the spreading 0,6 mm between plate and located slipped out stop.



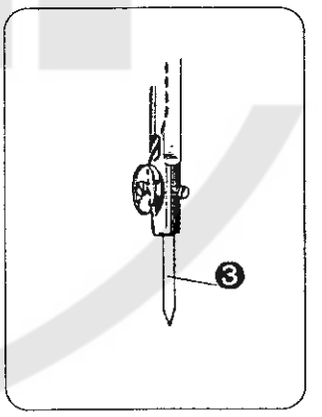
13. LENGTH SETTING-UP OF THE SECOND BUTTONHOLE ROW

1. Loosen the locking nut ❶ and rotate the adjustable screw ❷ for the correct last stitch stop location.
2. Rotating the screw in, the second row of stitches will be shorten, rotating the screw out, the second row of stitches will be longer.



14. EYE SHAPE CONTROL

1. Install the throat plate.
2. Insert the prick-in needle ❸ 02.0001.0.000 into the needle bar. The depth of the needle into the needle bar must allow the point of the needle to just barely penetrate a piece of paper.
3. Place a piece of paper across the clamp area of the bedplate to check needle penetration.
4. Switch on the motor power.
5. Sew the sample and check regularity of the eye shape sewing. Remove appropriate faults according to the previous sections.

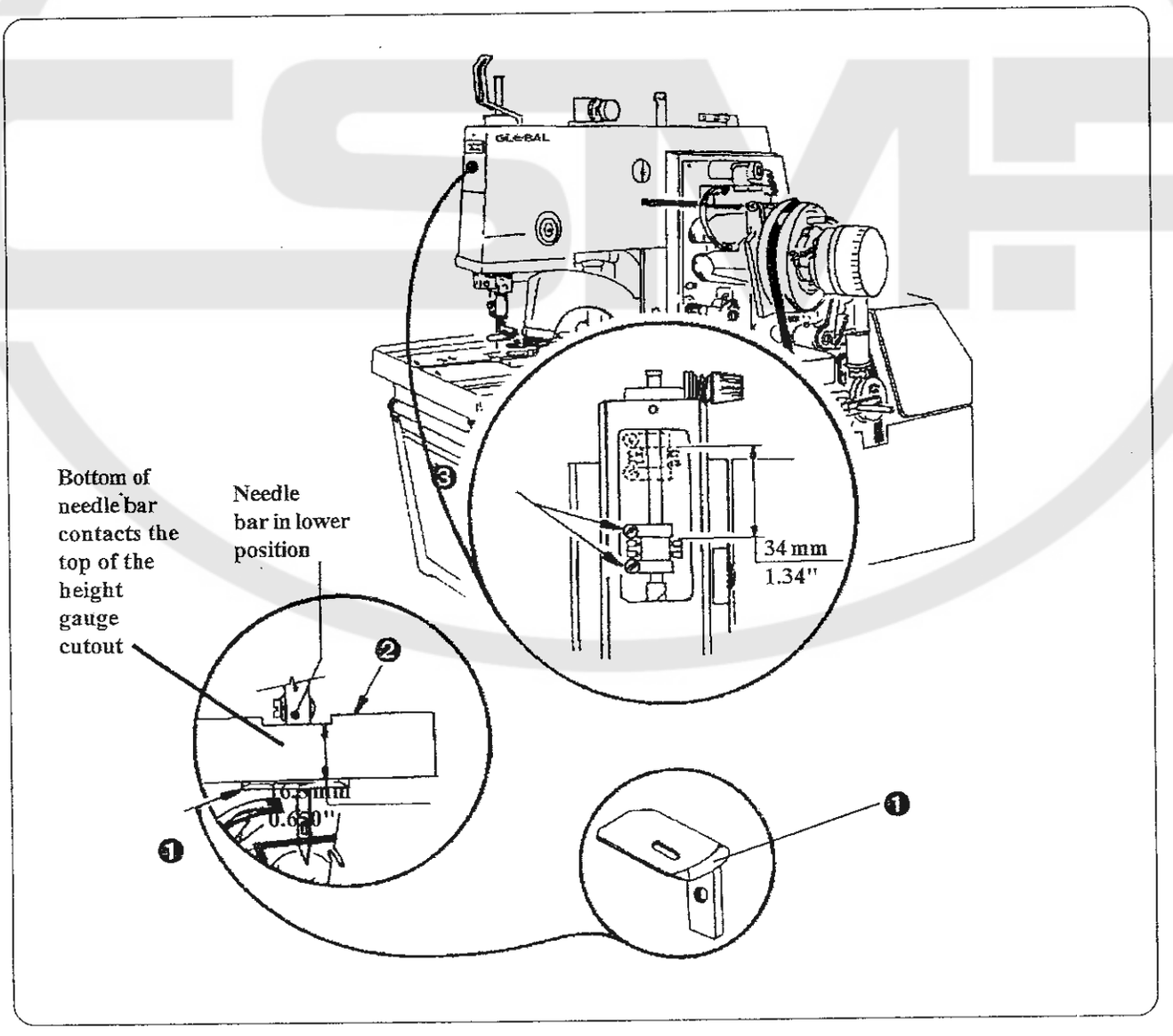


15. NEEDLE BAR HEIGHT

1. Perform this adjustment when the machine is in the home position
2. Remove the throat plate and the needle.
3. Install the support of the gauge ❶, instead of throat plate.
4. Install the needle bar height gauge ❷ and check the needle bar height, with the needle bar set at the bottom of the stroke. Standard height of the needle bar is 16.5 mm, (0.65") between the top of the gauge cutout and the bottom of the needle bar, when the needle bar is at the lowest point.

If the adjustment is incorrect :

5. Remove the front cover of the head.
6. Loosen the screws ❸ and move the needle bar up or down as needed. The needle bar can not have an axial clearance, but it must free rotate.

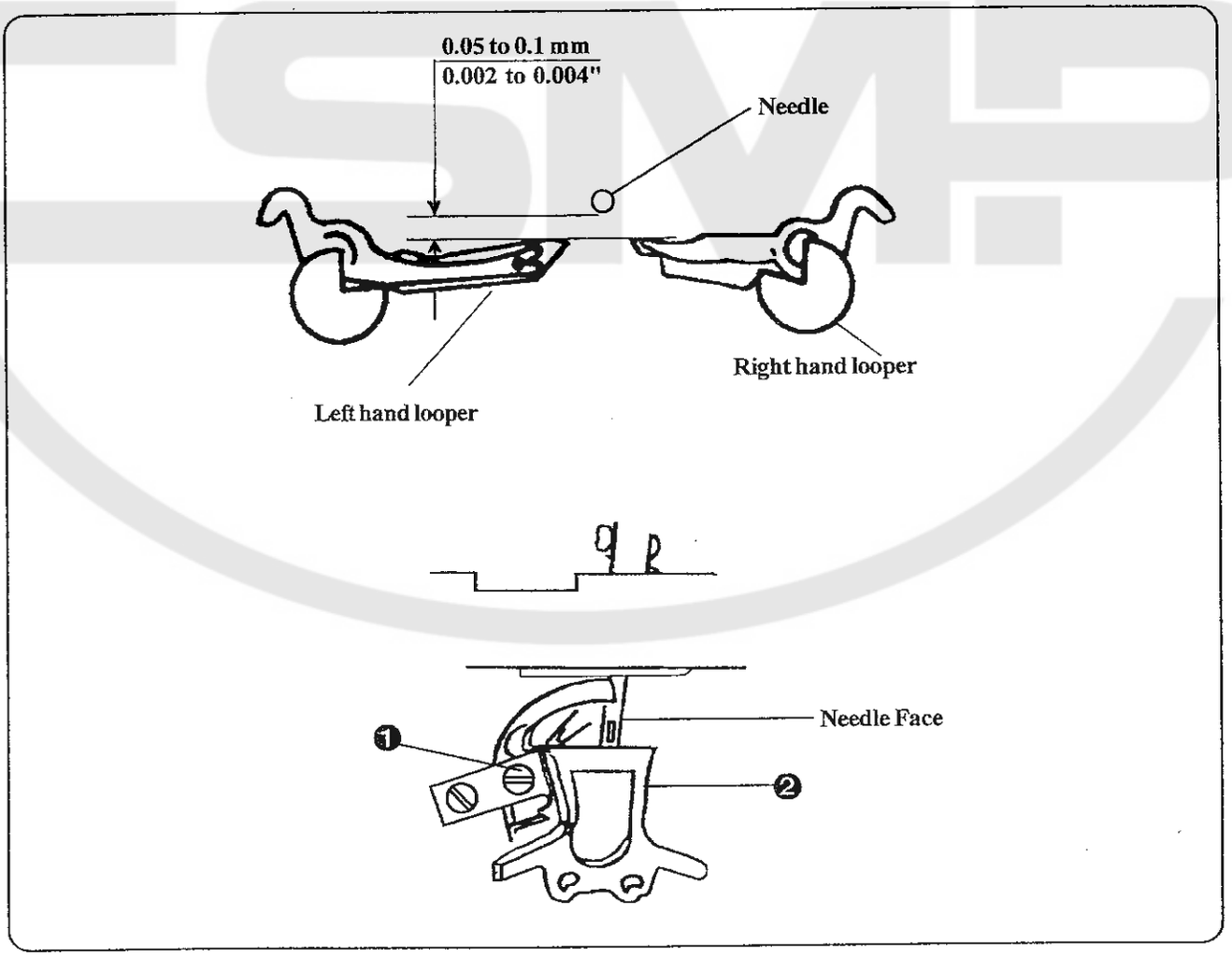


16. ADJUSTMENT OF THE LOOPERS TO THE NEEDLE

After setting of the loopers is necessary to adjust center puncture to the buttonhole axis. Differently adjust the needle bar by the machines BH 1000, see MACHINE ADJUSTMENT ROUND BUTTONHOLE - Differently position of the machine mechanisms BH 1000. The standard clearance between the loopers and needle is 0.05 to 0.1 mm, (0.002 to 0.004").

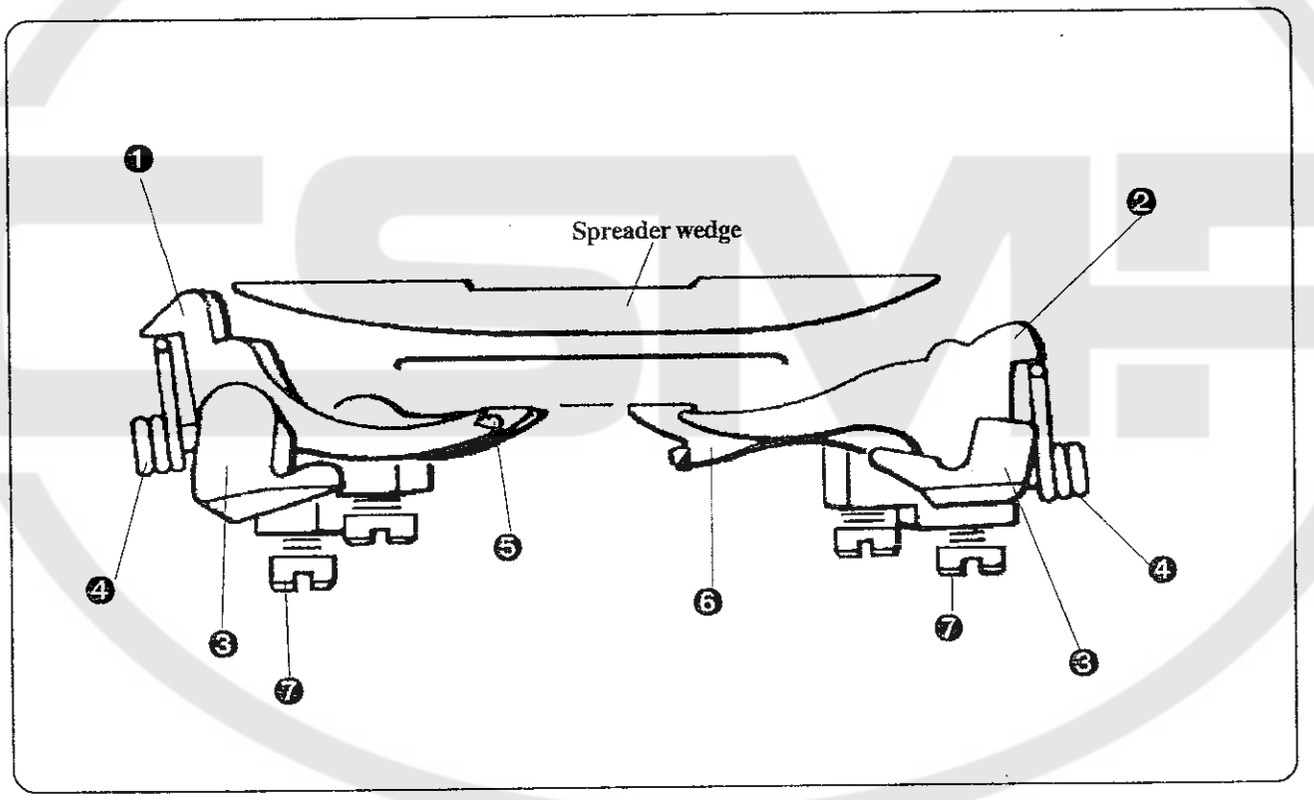
1. Manually rotate the right hand wheel and ensure the distance between the needle and each looper, as the needle passes the loopers at the closest point, are equal. Is suitable to check it on the both sides of the buttonhole.
2. It is possible to adjust the clearance after loosing the screw and turning the loopers forward or backwards to obtain the proper clearance. Then tighten the screw ❶.

The recommended clearance between the face of the needle and back of needle guard ❷ is between 0.05 to 0.1 mm, (0.002 to 0.004"). To adjust, bend the needle guard in or out as necessary in order to obtain the proper clearance.



17. SPREADERS ADJUSTMENT

Install left ❶ and right spreader ❷, spreader stops ❸ and its springs ❹.
Left fork spreader adjust above the hole in the left looper ❺.
Inner side of right spreader adjust to the same level with appropriate inner side of the right looper ❻.
It is possible to do adjustment after loosing the screws of the stop ❼ by its swinging.
Check both spreaders operation and find if the spreaders do not catch the loopers or spreaders stops.
Check whether the loopers have axial clearance. If yes, define the clearance after loosing the screws of the spreader stops by shifting of the stops ❼.

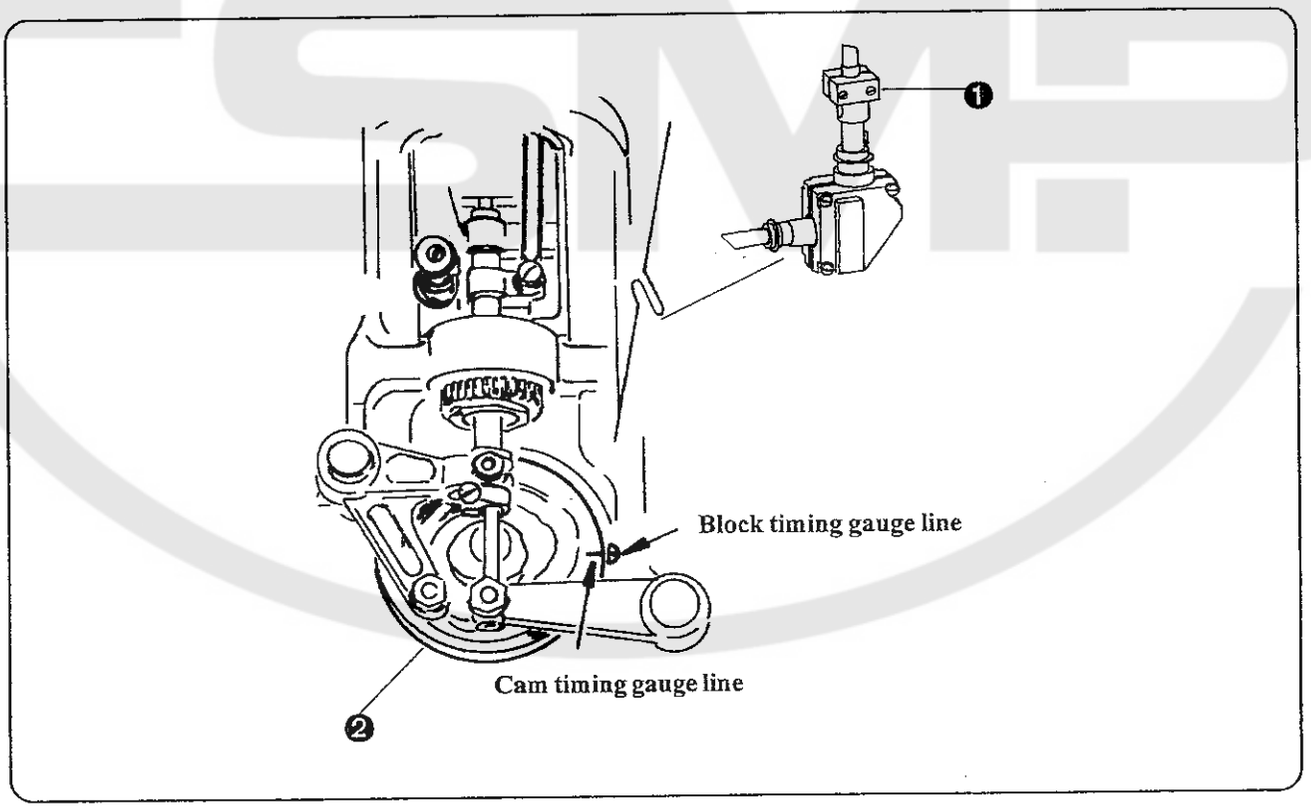


18. ADJUSTMENT OF THE LOOPERS MOVEMENT

Turn the left handle of the machine until the drive shaft is released. Turn the right hand wheel until the needle bar is in the lower position of the center puncture.
Lift the machine head and after loosing of the screws ❶ of the clutch is possible to turn by the sewing cam ❷ until the timing gauge lines are aligned, which determines the correct position of the loopers adjustment.

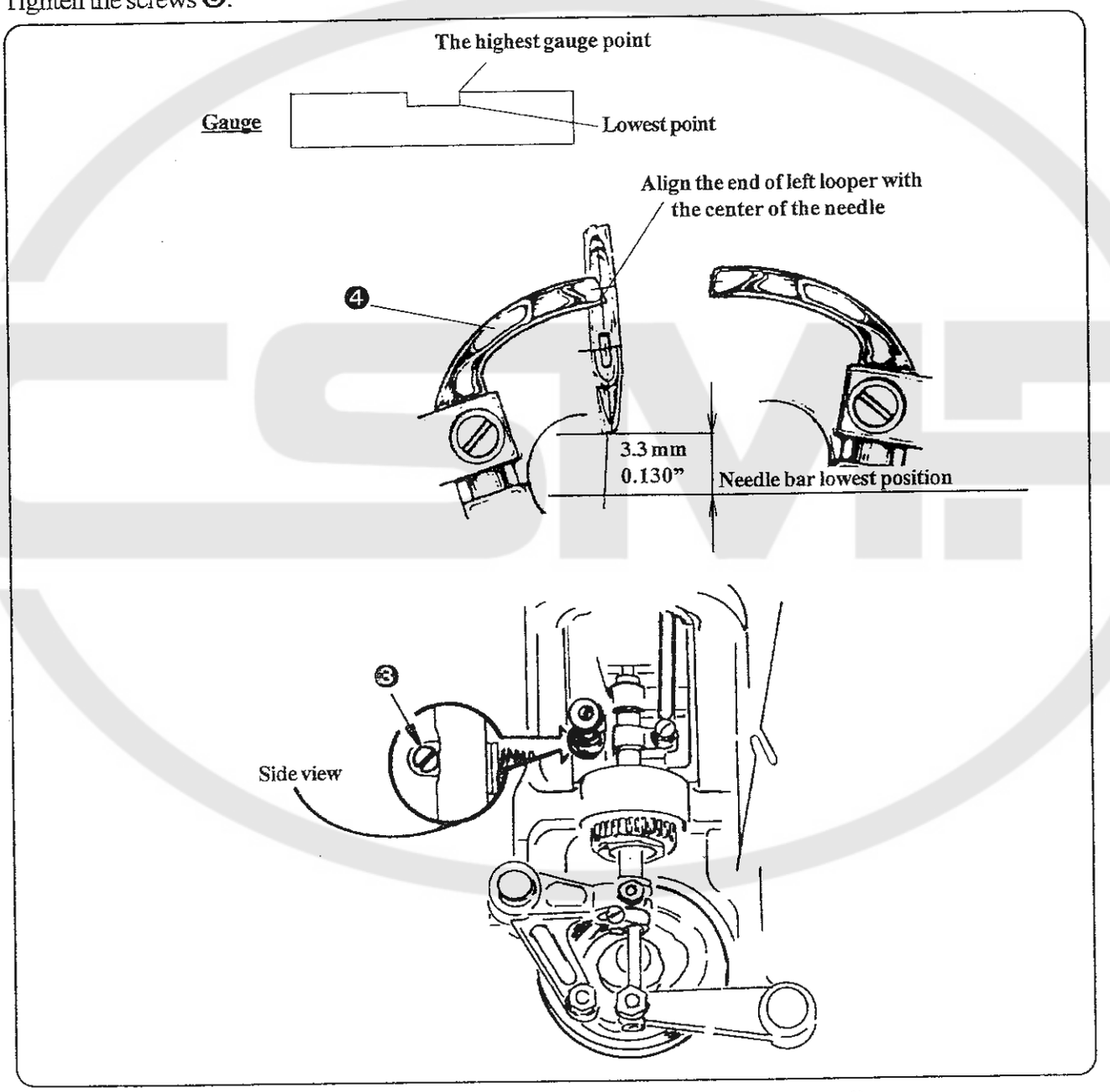
CAUTION! If there is no gauge line on the block, adjust the cam by the timing gauge line to the center of the block.

Tighten the screws ❶.
During the machine control is possible to check this adjustment when the threads are threaded. The needle bar is in the lowest position, center puncture, timing gauge lines should be aligned.



Rotate the right-hand wheel until the needle bar reaches the lowest point of the first needle bar stroke 3,3 mm (0.130"). The correct adjustment allow enclosed gauge located on the support. The point of the left-hand looper must be half way across the needle. Needle bar must lean on the highest point of gauge. Now it is necessary to loosen the screws ❸ and move the left-hand looper ❹ to the right or left, to bring the looper into the needle center line.

Tighten the screws ❸.



Note: Repeating the above mentioned steps is usual for reaching of the correct adjustment.

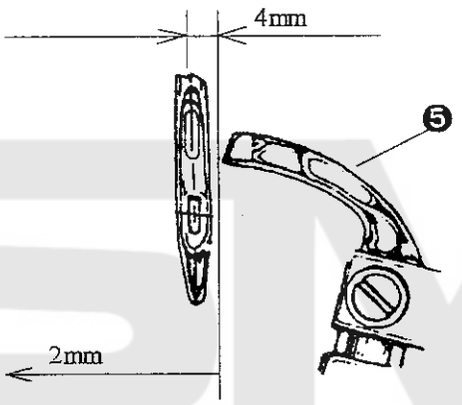
CAUTION! Using BH 1000 designed replacement parts, will ensure the best quality and highest production possible. The part numbers are listed in the Parts Section of this manual.

D - MACHINE ADJUSTMENT

Rotate the right-handwheel until the needle bar reaches the lowest point of the vibrator stroke. After raising the needle bar 3.5 mm, (0.140"), note the position of the right ❺ looper point to the center line of the needle.

If the looper point is not to the center line of the needle, loosen the clip screw and move the right-hand looper half the distance to the needle center line, by this you align the distance of both loopers.
Tighten the screw.

Example: **Total distance is 4 mm - move the end of the looper toward the center of the needle 2 mm (0.079")**



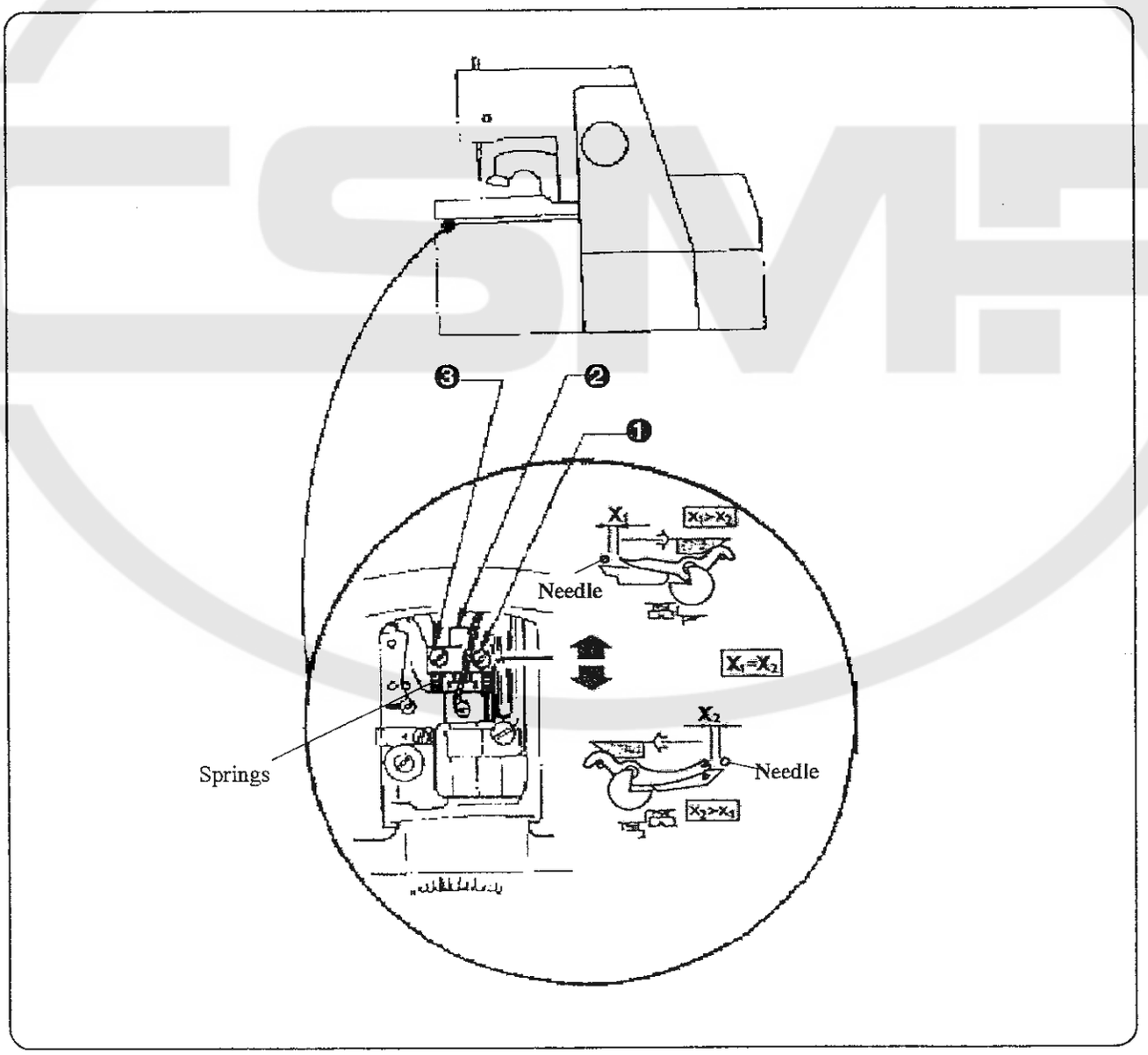
CAUTION! Check both needle bar strokes to ensure both sides are equal distance from the point of the looper to the needle centerline.

19. SETTING - UP OF THE SPREADERS MOVEMENT

It is necessary to adjust the spreaders so that the left and right spreader is opening and closing equally on the left and right, without contacting the needle.

Carefully loosen the spreader crosshead set screw ❶, located in the spreader spindle. ❷. It is necessary to hold the spreader crosshead ❸ to protect it against self adjustment by the pressure of the springs. Adjust the correct position.
Tighten the crosshead set screw ❶.

IMPORTANT! The right and left-hand spreader distances X, from the needle, must be equal.



20. CUTTING LEVER AND ANVIL

1. Side adjustment of the cutting lever do with inserted knife after loosing the cutting lever studs locknuts ❶ and by moving the studs ❷ to the left or right, as needed.

2. Tighten the studs ❶.

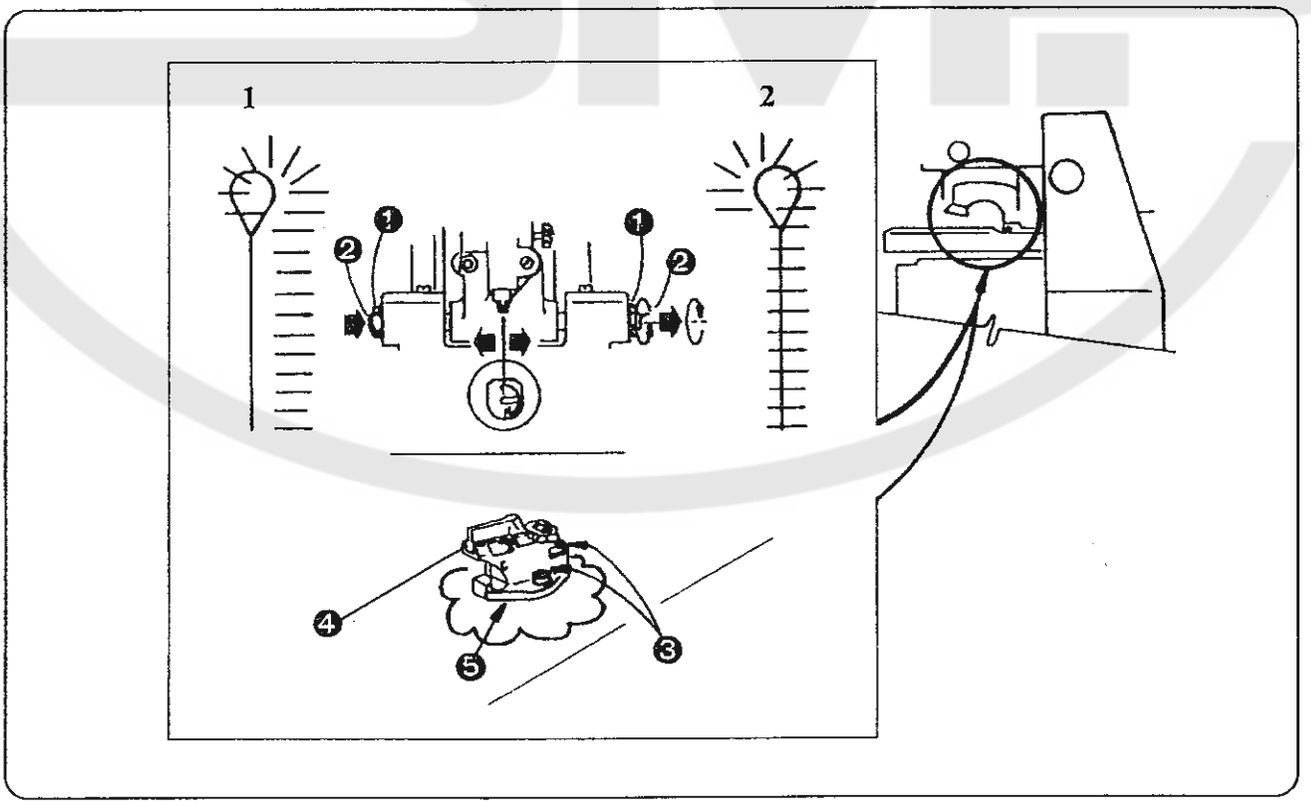
Note : If the buttonhole cut looks like illustration **1**, rotate the studs ❷ to the right, if the buttonhole cut looks like illustration **2**, rotate the studs ❷ to the left.

3. After anvil adjustment ❹, insert the cutting knife.

4. Loosen the knife holder set screws ❹, and by holder ❺ shifting to the left or right, obtain the proper position of the lower knife.

5. Check by manual pressing of the cutting lever, if both knives have the same position.

6. After setting-up, do not forget to replace one of the knives by suitable cutting steel. Then tighten the set screws ❸.



21. KNIFE AND CUTTING STEEL CHANGE

Various types of knives (straight buttonhole, cutting before and after sewing) and steels for machine BH 1000 can be replaced.
It is possible to place the knife to the cutting lever and steel down or opposite.
It is possible to deliver below mentioned cutting knives and steels.

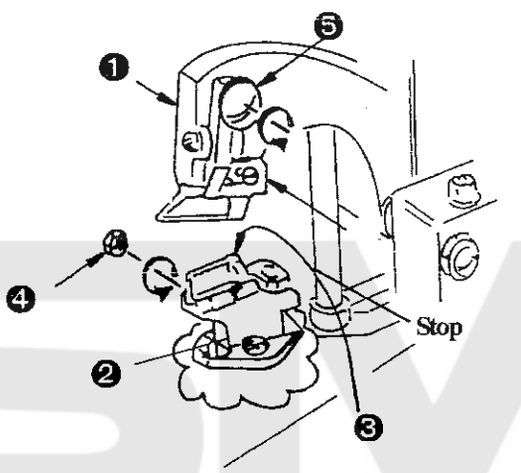
Length of buttonhole	Washers Length	Knives					
		3/5 CA-T	3/5 CA	3/5 CB-T	3/5 CB	O-T	O
10	19.0064.5.846	18.0087.0.407	18.0087.0.405	18.0087.0.408	18.0087.0.406	17.0064.6.325	17.0064.5.863
12	19.0064.5.847						
(13)	19.0064.5.951						
14	19.0064.5.848						
16	19.0064.5.849						
18	19.0064.5.850						
(19)	19.0064.5.952						
20	19.0064.5.851						
22	19.0064.5.852						
24	19.0064.5.853						
26	19.0064.5.854						
29	19.0064.5.855						
32	19.0064.5.856						
35	19.0064.5.857						
38	19.0064.5.858						

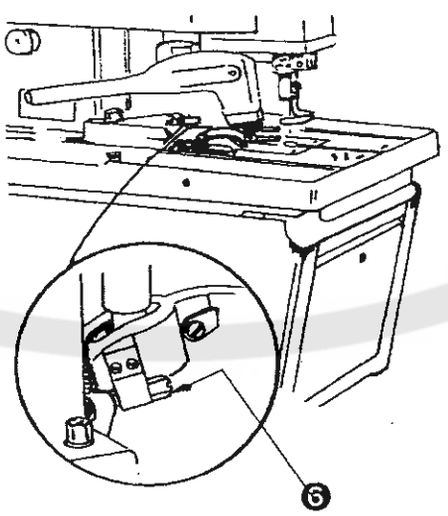
CAUTION! The cutting pressure must be adjusted when the cutting steel is replaced or the material being sewn changes. Cutting steel is changed according to the buttonhole length.

WARNING! Before doing any adjustment, switch off the main machine power and for the machine BH 1000 disconnect the air supply and release any stored air in the machine. To obtain correct buttonhole cuts, perform each step of the following procedure. Failure to follow these steps may cause knife breakage and possible machine damage.

1. Remove the knife and cutting steel.
2. Ensure the contact surface of the cutting lever ❶ and the knife holder ❷ are not damaged.
3. Install the new cutting steel ❸ into the knife holder and install the new knife into the cutting lever and lightly tighten the knife locking screws ❹, ❺.
4. Manually lower the knife against the cutting steel to seat the knife in the cutting lever ❶ and fully tighten the knife locking screws ❹, ❺..
5. Manually lower the cutting lever toward the knife holder and ensure the knife and the cutting steel are correctly aligned.
6. Decrease the cutting lever pressure by rotating the pressure adjusting screw ❻ counter clockwise three revolutions. Steadiness of the intersection is suitable to find out by manual knife compression against cutting steel with inserted paper. Print must be even. It is not recommended to repair damaged knife. Cleaning of the cutting steels must be done by machine grinding or by soft emery paper. Any grooves can cause dirty fabric intersection.

7. Then position a piece of fabric between the knife and the cutting steel and cycle the machine and check the cut of the fabric. The cut must be even and can not be discontented through the whole length. If is it incorrect, rotate the pressure adjusting screw ❻ one revolution clockwise only, cycle the machine and check the cut. Increase the adjusting screw pressure one revolution at a time until a correct cut is obtained.



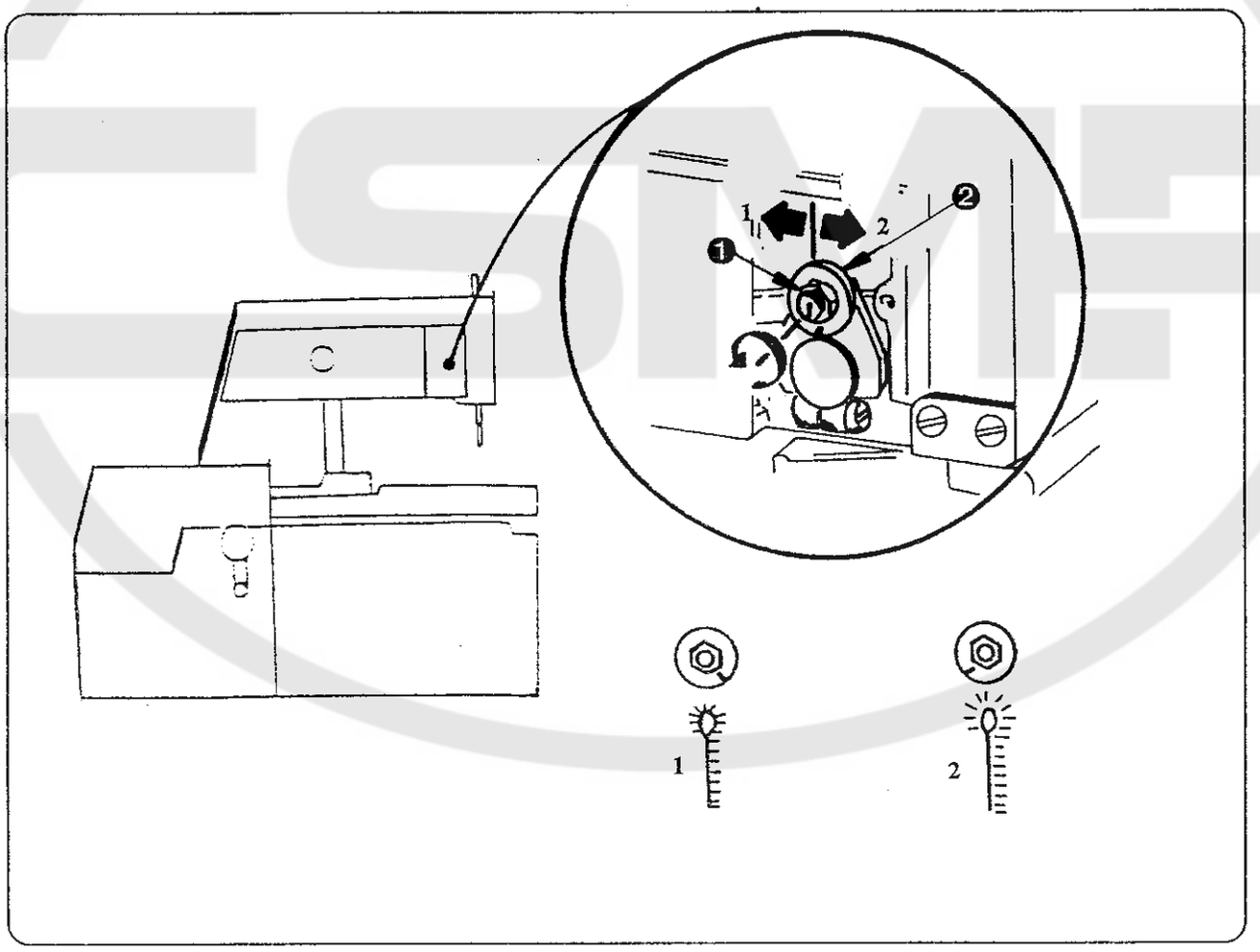


22. CUTTING SPACE MODIFICATION

Change of the stitches rows position, increase or decrease the cutting space, it is used especially when the cutting before is changing to the cutting after.

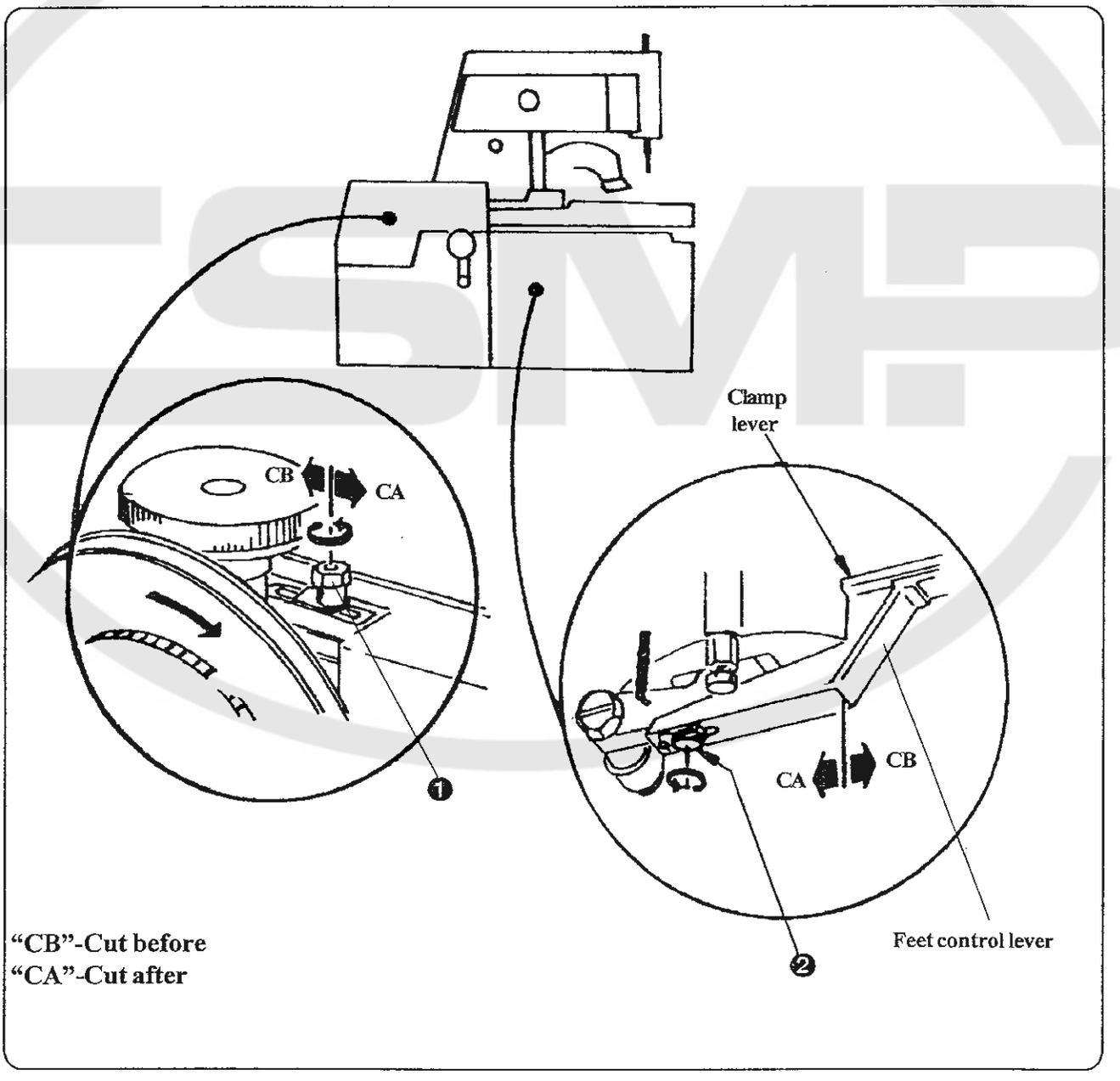
1. Loosen the nut ❶.
2. Turn the eccentric ❷ clockwise for the more cutting space, as illustrated in example **2** of anti-clockwise for less cutting space, as illustrated in example **1**.
3. Tighten the nut ❶.

Note: When the change of the cutting space is performed, it can be necessary to do loopers adjustment, or upper thread trim knife adjustment.



23. CUT BEFORE AND CUT AFTER

Ensure the change by two functional components, after loosing the locking nut ❶ above and screw of the feet control lever ❷ down and by shifting in grooves in direction to the marked stops as needed, CA is cutting after and CB is cutting before. The stop screws are ensured by the color. Without serious reason, do not manipulate with position of the stops.
Loosen the two locking components ❶, ❷.
After rearrangement is necessary to twice mechanically tests the machine cycle (without sewing) - the first cycle is usually incomplete.



"CB"-Cut before
"CA"-Cut after

24. KNIFE ADJUSTMENT FOR UPPER THREAD TRIM

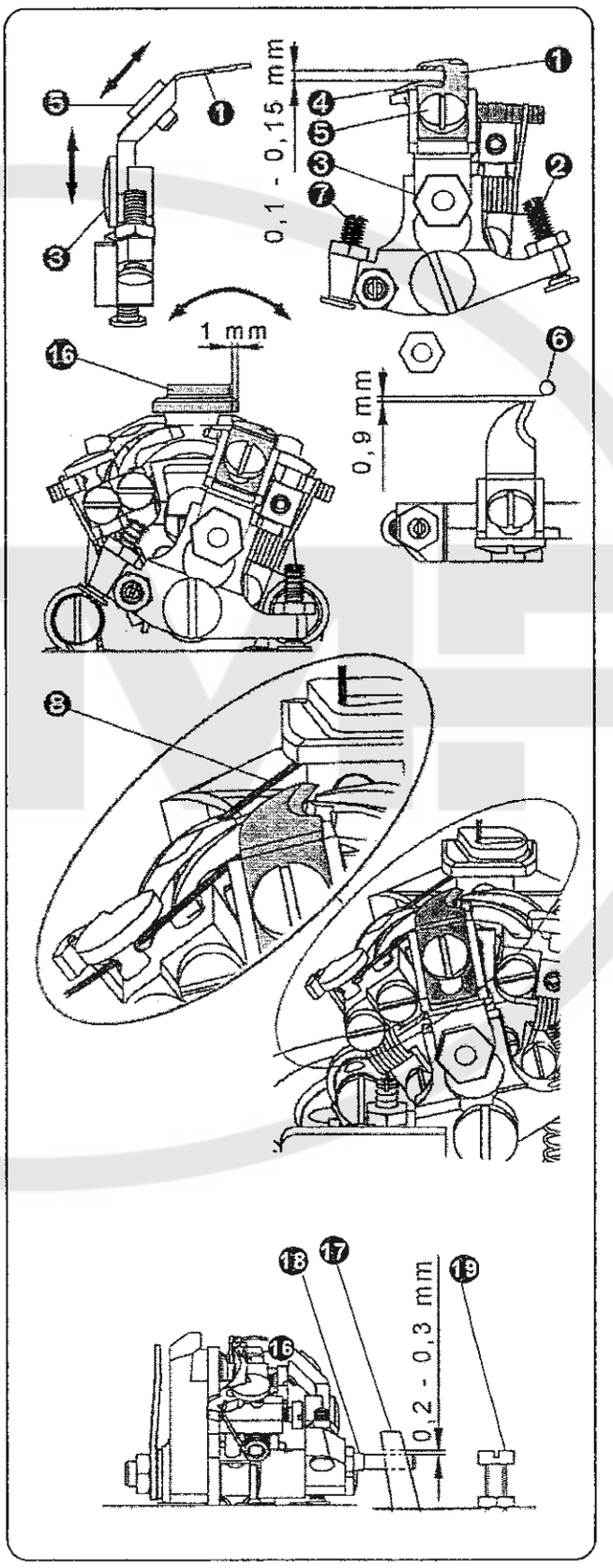
1. After repeatedly mounted holder with thread knife ❶ loosening the knife travel nut ❸, set the thread trimming knife height to reach the clearance 0.1 to 0.15 mm, above the right side spreader ❹.

2. The basic angle of set cutting knife ❶ adjust by scerw ❷, so taht the left side of the knife is covered with right side of the throad plate ⓰.

3. The knife position ❶, required for catching the upper thread loop, can be changed after loosening the screw ❺, so that the knife edge is 0,9 mm from the needle ❻. When the knife position is changed it is necessary to check the height emendation to preserve the clerance - see ***article 1.***

4. The knife end position ❶ is limited by stop screw ❼ so that the cutting knife ❶ does not toutch upper thread by itself tip.

5. The initial position of the control lever ⓱ adjust to the space in range 0,2---0,3 from the stud ⓲ by screw⓳ after loosen ing its nut.

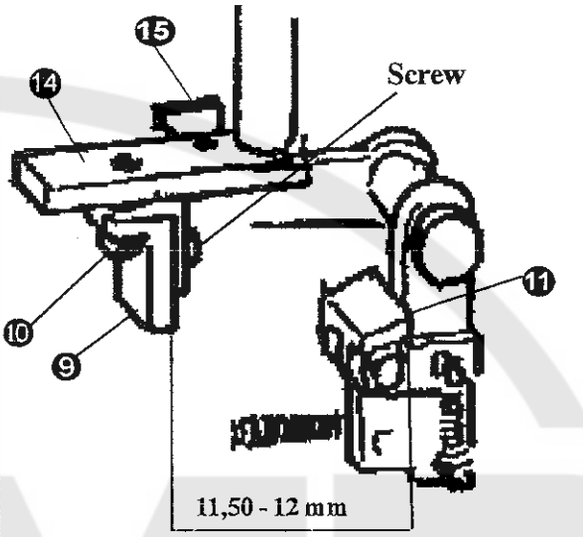


6. To adjust the actuator ⑨, loosen the actuator adjusting screw ⑩, then move the end position of the thread trimmer knife until the point of the knife passes the point of the right - hand looper, measured during the moment the actuator passes over the pawl ⑪ so that is between lever ⑫ and throated trimming knife arm ⑬ clearance 0,0 mm to 0,1 mm (0,0" to 0,004"), see picture 3. Tighten the screw ⑩.

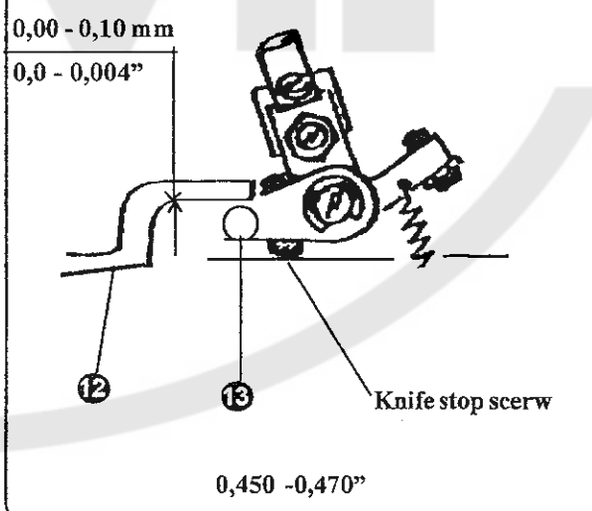
CAUTION ! The knife screw stops eliminates the risk of trimming the lower thread by limiting the range of the trimming knife motion, see picture 3.

7. Time the thread trimming by sliding the actuator holder ⑭ The basic adjustment 11,5 mm to 12,0 mm (0,450" to 0,470") is obtained in the initial machine stop position. This adjustment corresponds to the buttonhole length limit of 32 mm, (1,260"), adjusted by moving the holder lateral stop ⑮- see picture 2.

Picture 2

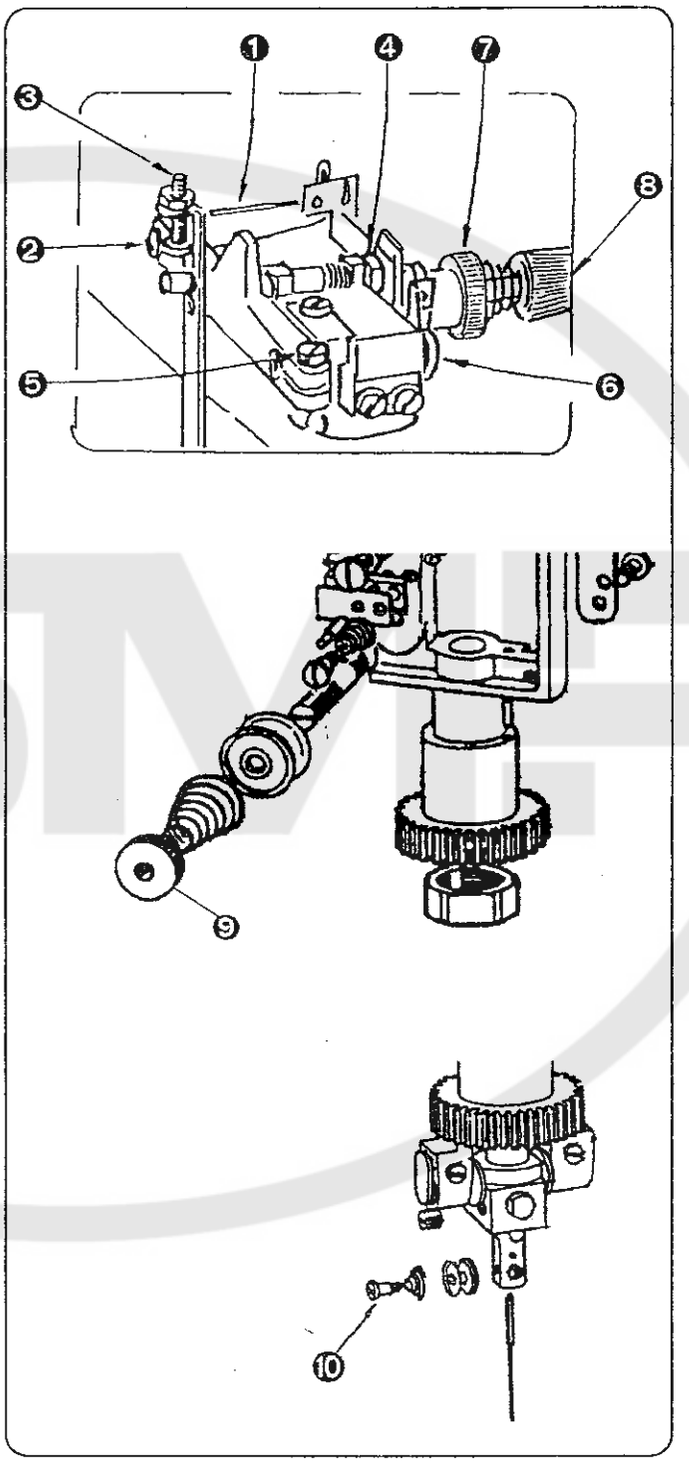


Picture 3



25. THREAD DRAW OFF MECHANISM

1. Basic position of the lever ❶ of the upper thread draw off is adjusted after loosing of the arresting screw ❷.
2. Measure of the upper thread draw off is adjusted by means of stop screw ❸ on the rod controlled by the cutting lever movement, which is manually shifted to the lower position. To protect the thread falls out of the needle, the thread can only be loosen after its clamping by the pin ❹.



Remember:

Inadequate thread draw off causes stitches missing in the beginning of the next button hole sewing. Excessive thread draw off causes extension of the thread end in the beginning of the cycle.

3. If the spring, which control the return of the lever for the upper thread draw off, do not prove the lift the lever to the upper position, is necessary to loosen the clamping screw ❺ and turn the sprung stud ❻ for increase of the pressure of the returnable spring.
4. For attainment the same length of the trimmed thread ends, use the nuts of the constant thrust ❼ for setting-up of the cutting tension for needed value 50 - 70 kg. When the tension is excessive, the last stitch unravels. Excessive loosen nut causes that the spring of the thread tension is not functional.

Note : The regulating nut ❽ is for the operator use, the constant trust nut ❼ is adjusted by the manufacturer, so that it is not necessary to adjust it further.

5. By turning the regulating nut ❽ clockwise the thread tension will increase.
6. By turning the regulation nut ❽ counter clockwise, the thread tension will decrease.

Draw the nut to sew hard materials (jeans), and loosen the nut to sew soft materials.

Using the nut ❾ on the race, is possible to affect the thread tension.

The soft tension ❿ on the needle bar is partially affecting loop tightening on the looper.

E - MACHINE ADJUSTMENT

WARNING ! - Check the electrical cables for damage.
- Check if the safety covers are in good condition. Replace damaged covers!
- Keep your hands out from the needle space!
- Do not modify the machine in any way, which can eliminate its safety parts.

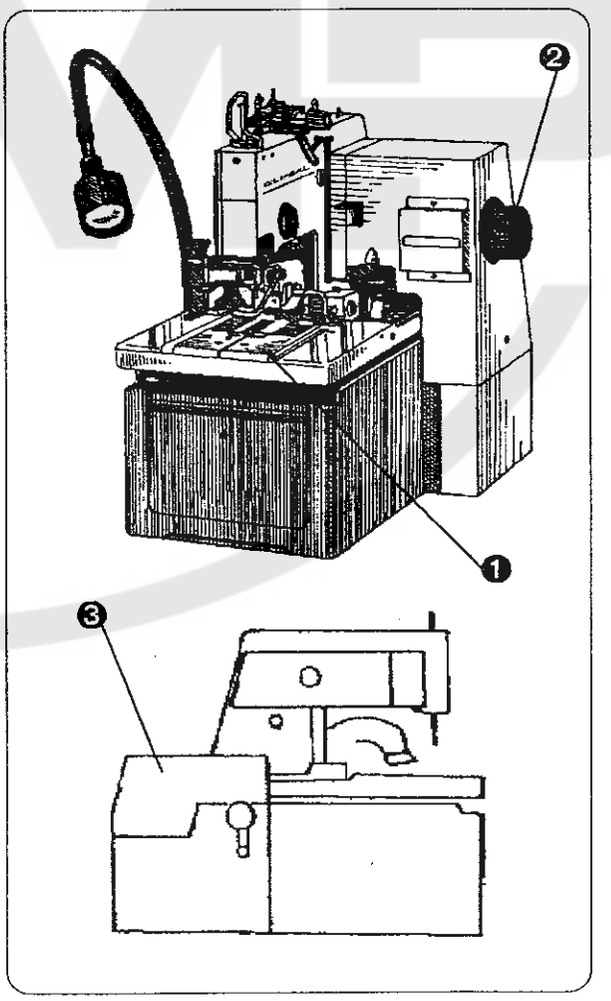
CAUTION ! - Do not neglect periodic maintenance.
- If there is any fault in electrical power supply, switch off the operating switch (circuit breaker).
- Do not damage, correct and remove safety labels.
- Do not work with the machine when you are under the influence of drugs or alcohol.
- User has to ensure that the lighting of the working area is minimal 750 Luxes.

1. CLEANING AND MAINTENANCE THE MACHINE

1. Switch the power off and disconnect the air supply.

2. For cleaning and maintenance, remove the clamp fees ❶ to access to the sewing mechanism. Then open the rear cover ❷.

3. Clean the thread lints and fabric from the sewing area, guides and thread tension. To move with the sewing mechanism, turn the hand wheel ❸. It is also possible to raise the machine head, to the locked position.



2. PERIODIC MAINTENANCE

WARNING ! Before making any machine maintenance, switch off the power switch (circuit breaker), which will prevent the accidental start-up and possible operator injury.

Once a day (10 hours of operation)
- cleaning of the sewing mechanism area
- remove the waste from the oil reservoir

once a week (80 hours of operation)
- visual check - external and internal mechanisms
- check the belts tension
- check lubrication of mechanisms

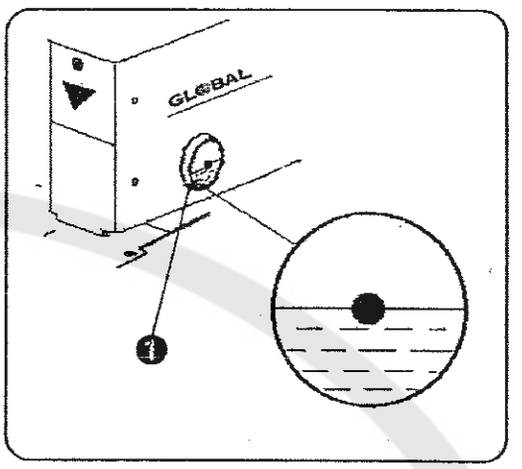
once a month (300 hours of operation)
- check of the throat plate wear
- check the screw connection tightening
- check the clearance in sewing mechanism drive
- check the condition of the wiring

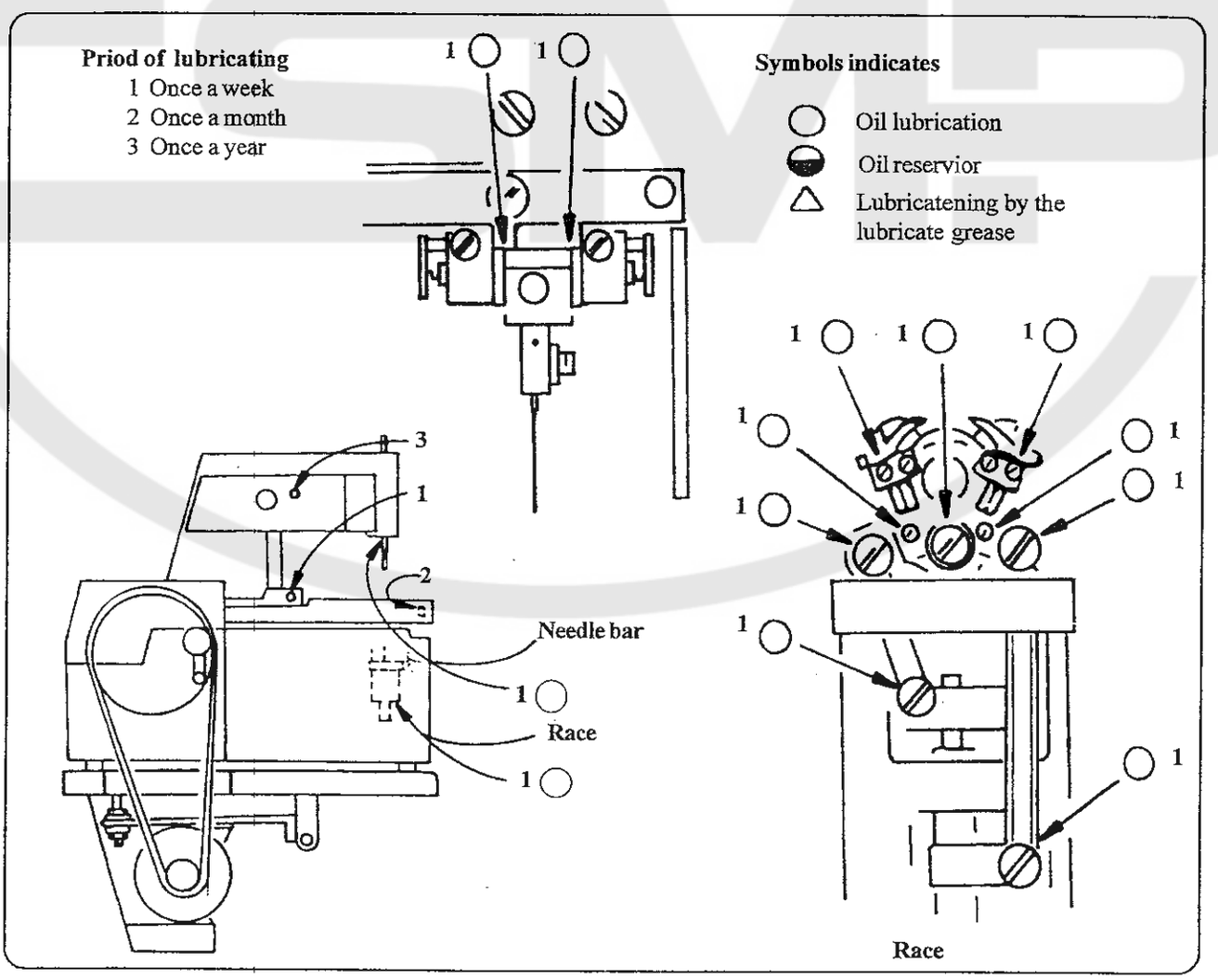
Recommended values of screw tightening (Nm):

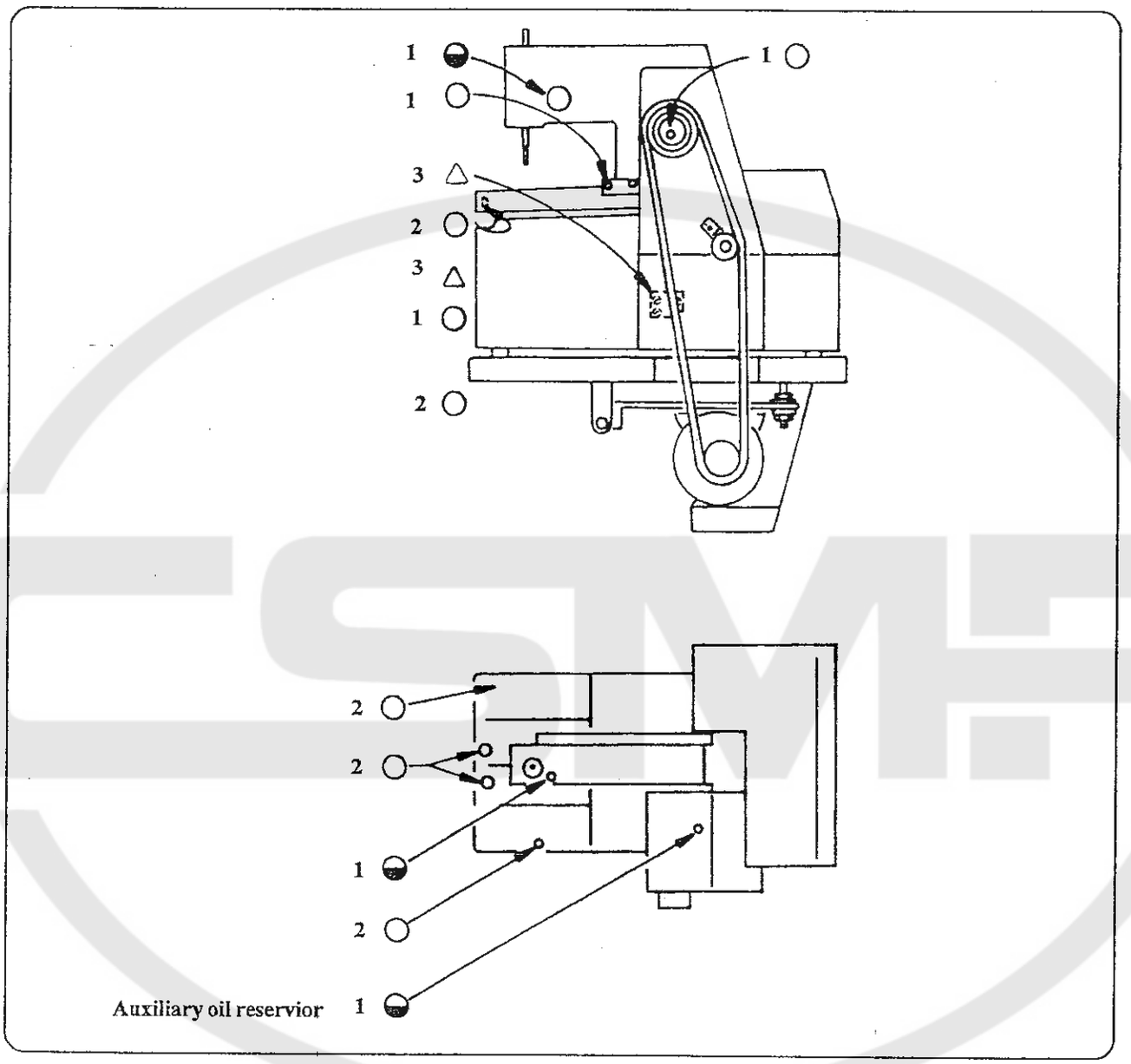
M3	0,5	0,6	0,8
M4	1,2	1,5	2,0
M5	2,5	3,0	4,0
M6	4,0	5,0	7,0
M8		8,0	16,0
M10		10,0	30,0
M12		25,0	54,0

3. MACHINE LUBRICATION

1. It is necessary to lubricate the machine before the first switch on, or after long time, when the machine did not operate. Use oil ESSO TERESSO 32 or oil with similar quality (in warm areas use oil ESSO TERESSO 80 - 90).
2. The amount of oil on the reservoir ❶ is indicated by the red mark. Too much oil may cause its overflowing in the needle bar area and smear the fabric.
3. The reservoir is filled approximately 10 cm³ of oil. After every lubrication, sew 10 cycles (buttonholes) on the piece of fabric, to remove excess oil.
4. The red marks and labels indicate the places on the machine, which must be lubricated once a week.







4. MACHINE DISPOSAL

1. To ensure machine ecological disposal it is necessary to remove especially nonmetallic parts from the machine. To take these parts out, it is necessary to perform the partial dismantling of the machine, remove covers, dismantle the machine arm and remove the frame.

2. Aluminium and duralumin parts must be treated separately, also another nonferrous metal parts and plastic parts.

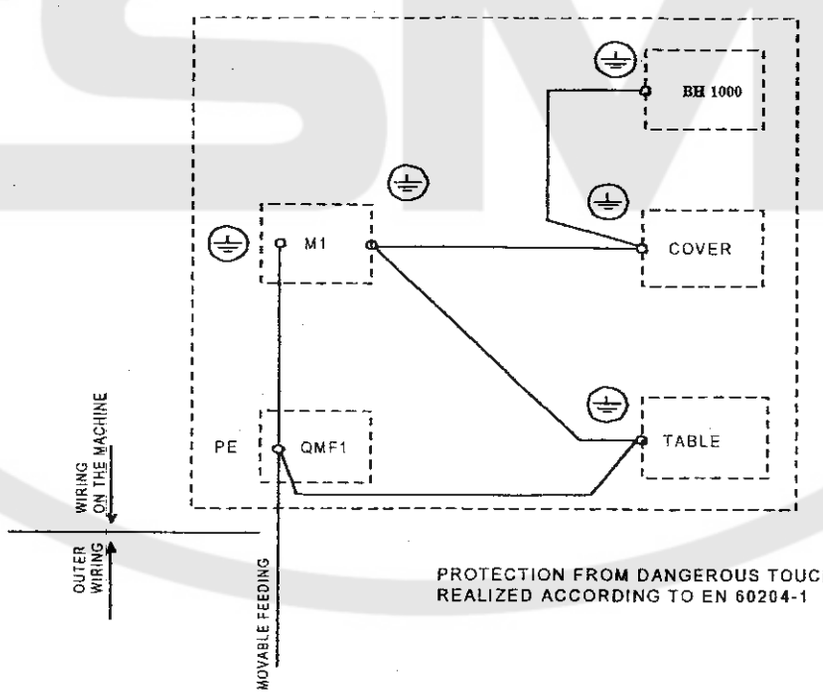
1. ELECTRICAL WIRING DIAGRAMS

WARNING! If the machine is not used with standard table, it is necessary to keep the connection, which correspond to safety precaution of the country, which is pursued in.

Standard table has motor 1425/1725 rotation a minute (50/60 Hz) 550 W. After machine connection is necessary to ensure electrical power supply of the machine in every fuse by the thermal fuse 10 A.

Electrical wiring of the table is supplied for following connection of the motor, needed diagrams of the connection are mentioned below:
1. Connection 1N+PE 115V/60 HZ
2. Connection 1N+PE 230V/50 Hz
3. Connection 3N+PE 400V/50 Hz
4. Connection 3N+PE 230V/60 Hz

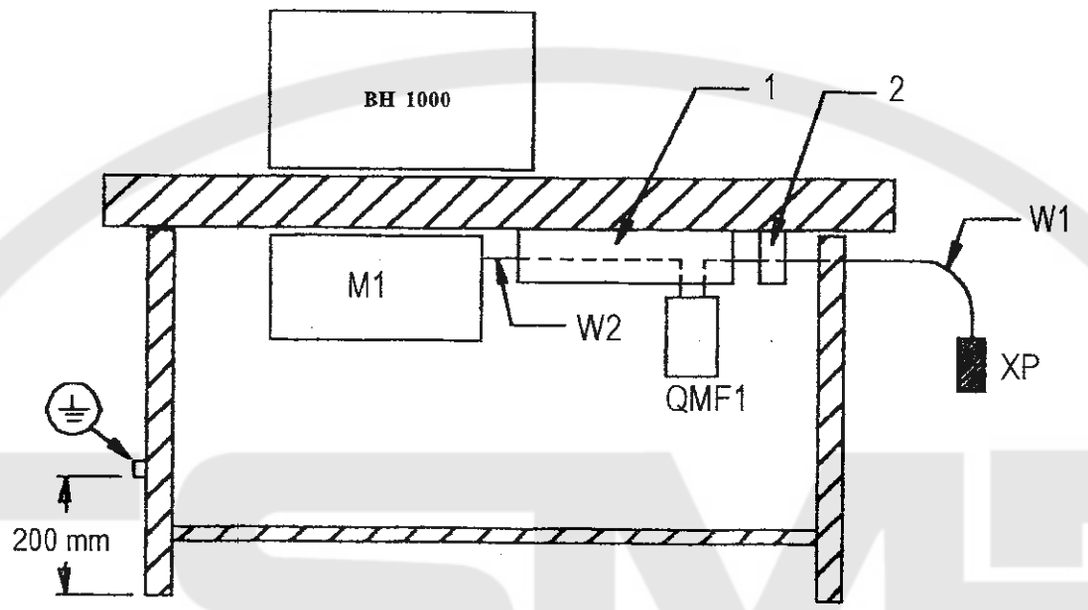
CAUTION! It is necessary, to connect the conductive construction elements according to the diagram, protection from dangerous touch realized according to EN 60204-1. The original table delivery includes all required parts.



LEGEND

BH 1000 - CLOTHING BUTTONHOLE MACHINE
M1 - 3 F MOTOR; 1148/C
QMF1 - CIRCUIT BRACKER WITH OVERCURRENT PROTECTION SM1-2,5
⏚ - INNER TERMINAL CONNECTOR FOR POTENCIONAL DIFFERENCE OF EQUALIZING
- PROTECTIVE JOINING OF CONDUCTIVE CONSTRUCTIONAL PARTS WITH A CONDUCTOR 1 mm CONDUCTORS COLOUR - GREEN YELLOW

ASSEMBLY DIAGRAM



LEGEND:

BH 1000 - CLOTHING BUTTONHOLE MACHINE
QMF1 - WORK SWITCH - CIRCUIT BREAKER WITH OVECURRENT PROTECTION SM1-2,5
XP - MAIN SWITCH - PLUG
M1 - 3Ph MOTOR; 1148/C
W1 - FEED CABLE
W2 - FEED CABLE FOR M1
⏚ - INTER TERMINAL CONNECTOR FOR POTENTIAL DIFFERENCE EQUALIZING
1 - COLLECTOR STRIP LV 40X15
2 - CABLE CLIP "A"
PROTECTION FROM DANGEROUS TOUCH REALIZED ACCORDING TO EN 60204-1

DIAGRAM OF CONNECTION 1N+PE 115V/60Hz

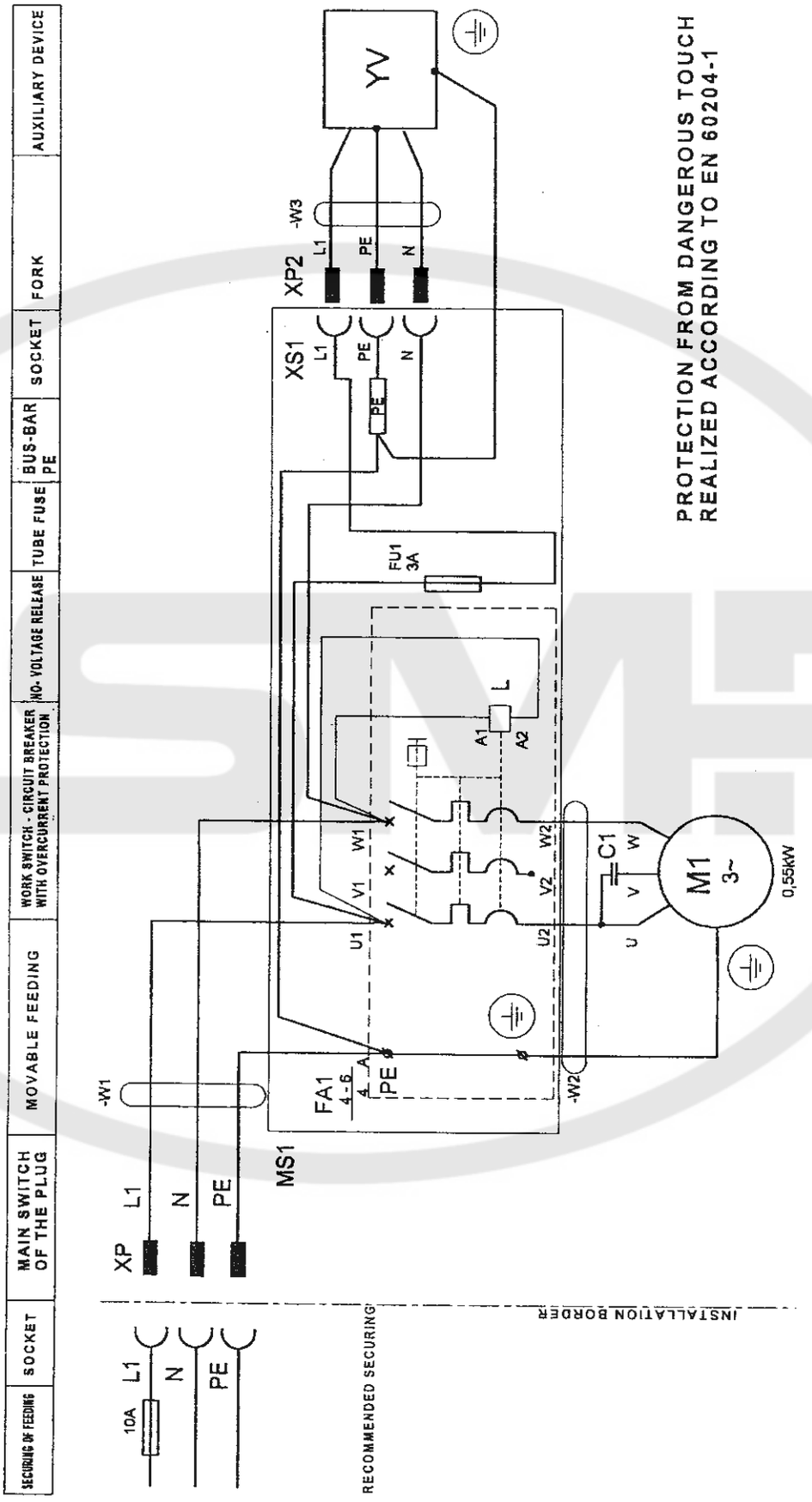


DIAGRAM OF CONNECTION 1N+PE 230V/50Hz

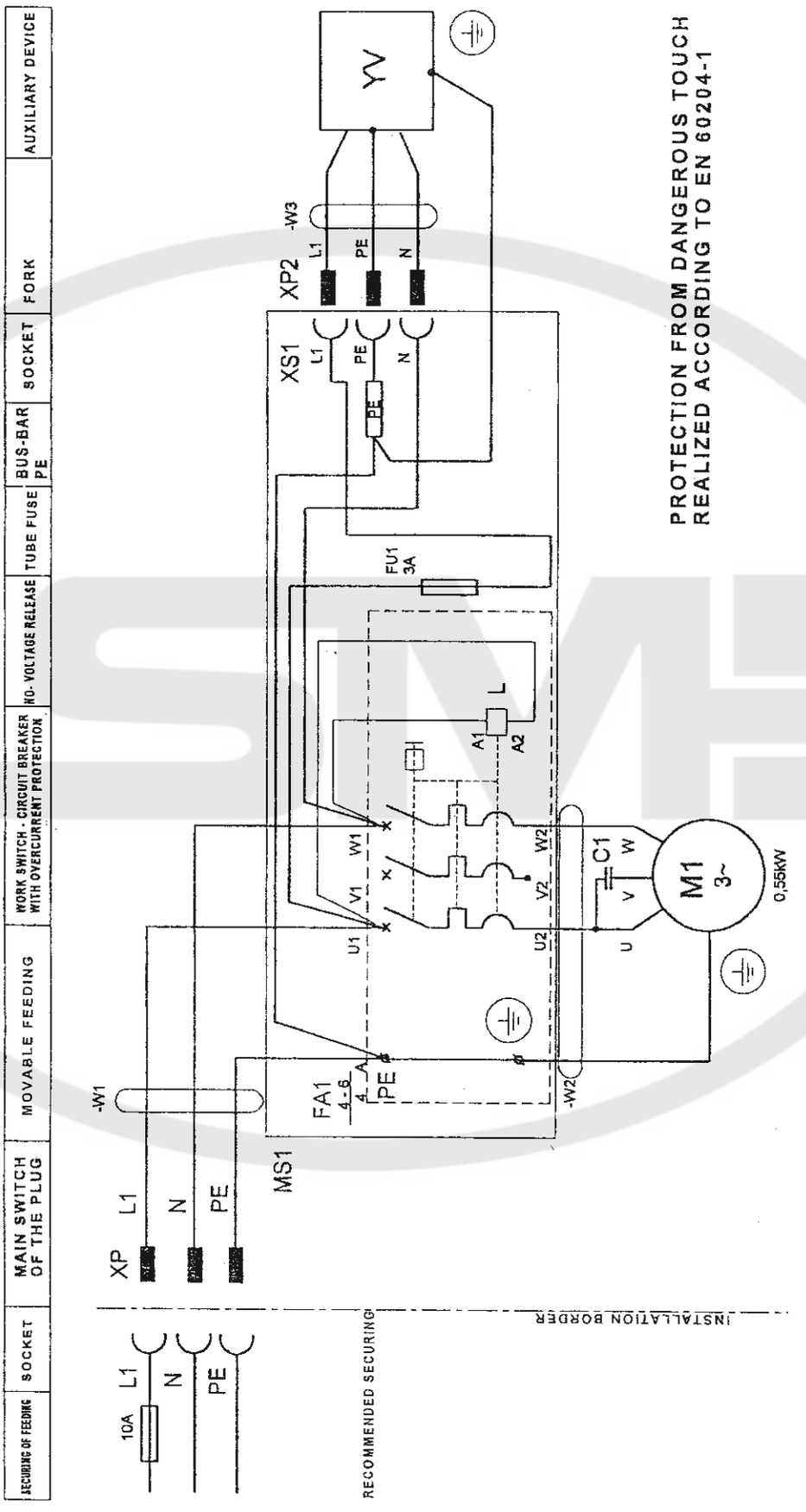


DIAGRAM OF CONNECTION 3N+PE 400V/50Hz

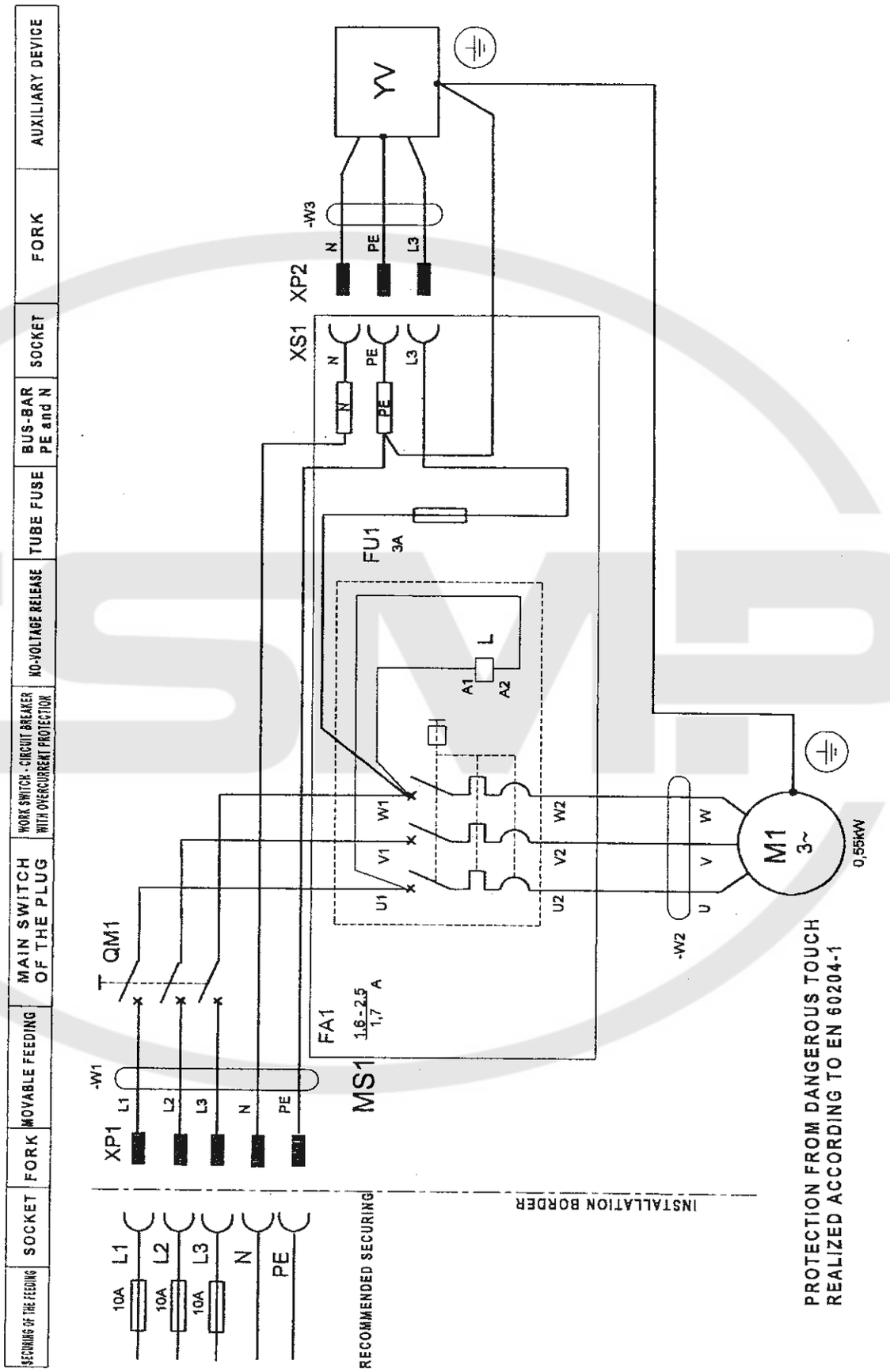


DIAGRAM OF CONNECTION 3N+PE 230V/60Hz

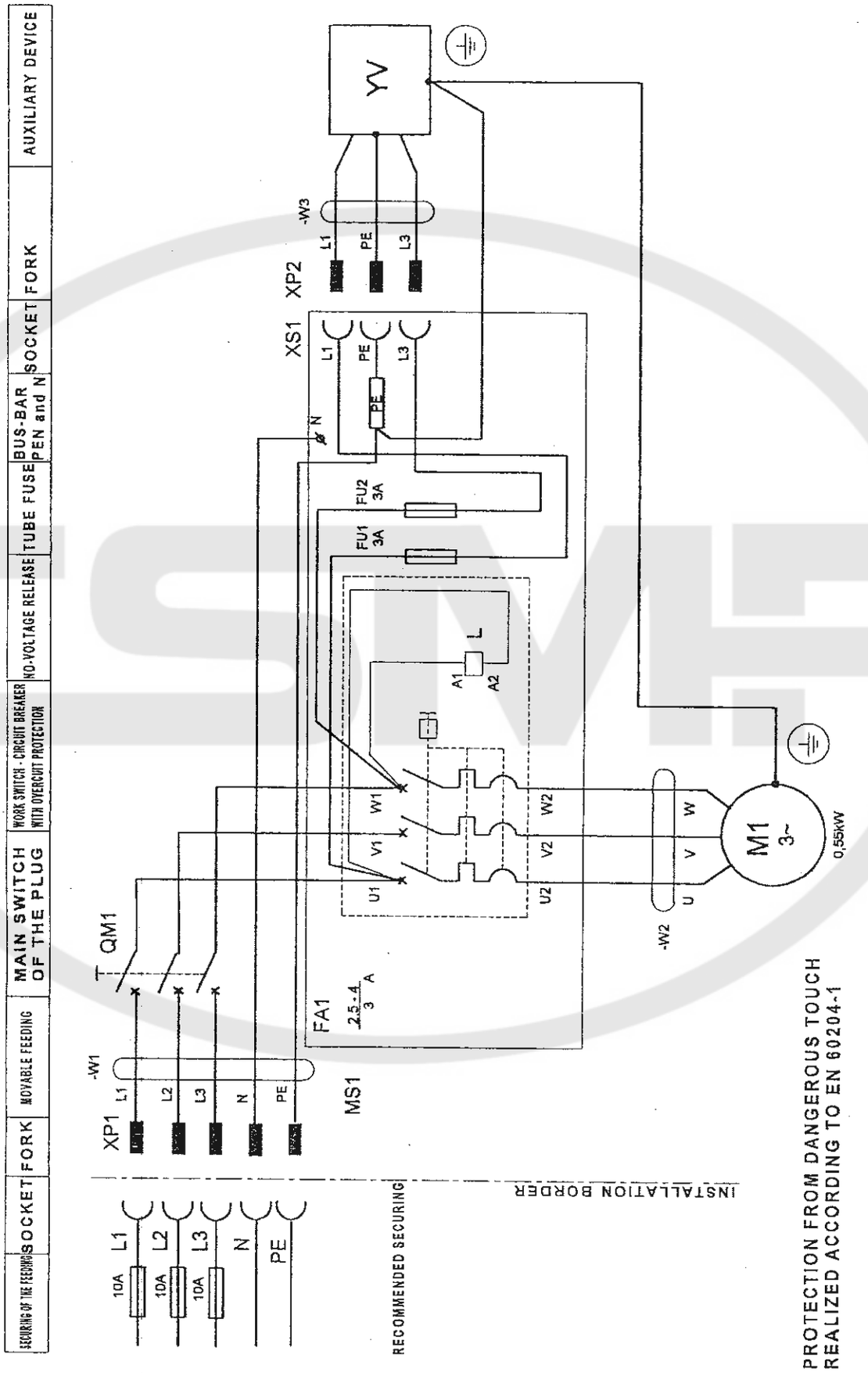


TABLE OF CONTENTS

Page

Motor fails to start 2-2
The machine fails 2-2
Machine starts, but stops prematurely 2-2
Machine starts, fails to stitch and stops 2-2
Machine fails to stitch, but completes the cycle 2-2
Machine fails to stop stitching 2-3
Machine fails to reach the end position 2-3
Machine fails to stop, but repeats the cycle 2-3
Knocking noise at machine start 2-3
Machine fails to clamp material or releases the material too soon 2-3
Machine fails to release the fabric clamp 2-3
Uneven clamp feet pressure 2-4
Machine fails to cut the fabric 2-4
Cutting lever fails to return 2-4
Skipped stitch at the sew start 2-4
Skipping stitches 2-5
Sewn end split seams 2-5
Needle thread break 2-5
Bobbin thread break 2-6
Needle break 2-6
Inconsistent buttonhole section seam 2-6
Sides of the seam at the straight section of the buttonhole are not uniform 2-6
Incorrect eye shape 2-7
Seams is cut by the CA knife 2-7
Incorrect buttonhole quality 2-7

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CHANGE	PROBABLE SOLUTION	PAGE
Motor fails to start.	No voltage.	Check the main lead wire.	
	Incorrect voltage.	Perform voltmetr check.	
	Electrical equipment defect.	Check the main switch,the cutouts, and the emergency stop switch.	
The machine fails.	Incorrect motor rotation.	Change the plugs.	
	Missing belt.	Replace the belt.	1-10
	Carrier teef are disengaged.	Change the drive lever spring or correct the idler pulley travel.	1-35
	Damaged drive gear.	Replace the drive gear 17.0033.5.113	1-35
	Idler pulley collar clampimg screw loose .	Correctly position the collar and tighten the screw.	1-35
The machine starts, but stops prematurely.	Excessive cutting pressure.	Correctly decrease the pressure.	1-51
	Stitch mechanism is not rotating.	Ensure the drive mechanism releases correctly.	1-11
	Left side of the drive belt is too loose.	Tighten the drive belt.	1-11
Machine startts, fails to stitch and stops.	Incorrect stitch lever function.	Correctly adjust the stitch lever.	1-34
	Disengaged friction clutch.	Correct pulley travel and adjust the pressure.	1-34
	Locked stitch mechanism.	Unlock and correctly adjust.	1-34
Machine fails to stitch, but completes the cycle.	Weak stitch lever spring.	Replace the spring. 17.0026.3.126	1-34
	Faulty stitch lever bumper.	Replace the bumper. 17.0082.5.996	1-34
	Faulty clamp lever spring.	Replace the spring.	1-34

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Machine fails to stop stitching.	Incorrect stop mechanism function.	Correctly adjust the pressure.
	Worn or damaged stop mechnism teeth.	Replace or correctly adjust the stop mechanism teeth.
	Broken tension spring.	Replace the spring.
Machine fails to reach the end position.	Cam braking belt tension too tight.	Correctly adjust the pressure.
	Incorrect table pulley travel.	Correct the table pulley travel.
	Damaged drive member.	Replace the drive member.
	Loosen adjusting roller nut.	Adjust and tighten the roller nut.
	Excessive cutting pressure.	Correctly decrease the cutting pressure.
The machine fails to stop, but repeats the cycle.	Damaged or weak strating lever spring.	Replace the spring 17.0026.0.214 or increase the pressure.
	Incorrect starting lever travel.	Correct the starting lever travel, lubricate.
	Incorrect adjusting roller setting CA/CB.	Correctly adjust the roller.
Knocking noise at machine start.	Incorrectadjusting roller setting CA/CB.	Correctly adjust the roller.
	Loose drive member.	Tighten the drive member nut.
	Pulley collar incorrectly set for high speed table travel.	Correctly adjust the pulley collar.
Machine fails to clamp material or releases the material too soon.	Incorrect treadle mechanism setting.	Correctly adjust the mechanism.
Machine fails to release the fagbric clamp.	Incorrect adjust roller setting CA/CB.	Correctly adjust the roller.
	Incorrect disengagement lever setting.	Correctly adjust the disengagement lever.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Uneven clamp feet pressure.	Rocker lever bearing screw loose.	Tighten the screw.
	Drive member loose or damaged.	Tighten the screw or replace the drive member.
Machine fails to cut the fabric.	Damaged knife.	Replace the knife.
	Damaged cutting block.	Repair or replace the block.
	Incorrect cutting pressure.	Increase the cutting pressure or replace the tracing finger.
	Damaged cutting lever .	Replace cutting lever.
	Loose machine frame csrews.	Tighten the screws.
Cutting lever fails to return.	Faulty extension spring.	Replace the spring. 17.0026.3.013
	Incorrect central pins setting.	Lubricate and adjust the pins.
Skipped stitch at the sew start.	Sew start thresd length too short.	Ensure the thread is clamped firmly.
	L.H. spreader incorrectly installed.	Adjust the L.H. spreader position.
	Incorrect R.H. looper timing .	Adjust the needle to the looper timing.
	The fork of the left spreader is out of the looper hole.	Adjust it.
	Incorrect the thread tension	Adjust the thread tension.
	Clamp foot to the needle entry point clerance too large.	Adjust the clerance.
	Bent or scratched looper.	Replace the looper.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Skipping stitches.	Damaged or incorrectly installed needle.	Replace the needle.
	Excessive looper to needle clearance.	Correctly decrease the clearance.
	Incorrect looper and needle timing.	Correct the looper and the needle timing.
	Incorrect spreader open/close timing.	Correct the spreader open/close timing.
	Excessive clamp foot to the needle entry point clearance.	Correctly decrease the clamp foot to needle entry point clearance.
	Unequal distance on the left and right - hand side of the fabric.	Correctly equal the distance on the left and right - hand sideof the fabric.
	Wear or damaged stitch plate.	Replace to the new one.
	Elastic material.	Carefully adjust the sewing mechanism.
Sew end split seams.	Incorrect needle thread tension timing.	Adjust the timing to loosen the tension.
	Incorrect right - hand looper timing.	Correctly adjust the needle to looper timing.
	Too litle right - hand spreader opening.	Correctly increase the spreader opening.
	Gimp is too hard.	Replace the gimp.
Needle thread break.	Excessive needle thread tension.	Correctly decrease the tension.
	The needle contacts the looper.	Correctly increase the clearance.
	Needle contacts the clamp foot.	Correctly increase the clearance.
	Needle contacts the holder.	Correctly increase the the clearance.
	Thread patch is worn or damaged.	Replace the thread patch.

TROUBLESHOOTING

SYMPTOM	POSSIBLE CAUSE	PROBABLE SOLUTION
Bobbin thread break.	Excessive bobbin thread tension .	Correctly decrease the tension.
	Incorrect left - hand spreader installation.	Correct the left - hand spreader position.
	Needle contacts the looper.	Correctly increase the clearance.
	Needle contacts the clamp foot.	Correctly increase the clearance.
	Needle contacts the holder.	Correctly increase the clearance.
	Thread patch is worn or damaged.	Replace the patch.
	Damaged left- hand spreader.	Replace.
Needle break.	Weak needle.	Use suitable needle.
	Needle contact the looper or spreader.	Correctly increase the clearance.
	Needle contact the clamp foot.	Correctly increase the clearance.
	Excessive needle to needle guard clearance.	Correctly increase the clearance.
	Incorrect needle bar height.	Correct the needle bar height.
Inconsistent buttonhole section seam	Incorrect main shaft and cam brake pressure.	Correct the main shaft and cam brake pressure.
Sides of the seam at the straight section of the buttonhole are not uniform.	Unequal amount of fabric for the left and right sides of the buttonhole.	Equalize the amount of fabric for both sides of the buttonhole.
	Incorrect knife drop position.	Correct the fknife position.
	Unequal left and right - hand pressure.	Equalize the left and right-hand pressure.
	Incorrect man shaft and cam brake prassure.	Correct the main shaft and cam brake pressure.

TROUBLESHOOTING

SYMPTOMS	POSSIBLE CAUSE	PROBABLE SOLUTION
Incorrect eye shape.	Improper lateral cam timing.	Correctly adjust the cam timing.
	Incorrect looper bracket initial position.	Correct the looper bracket initial position.
	Incorrect looper bracket turn angle.	Correct the looper bracket turn angle.
	Incorrect knife drop position.	Correct the knife drop position.
	Incorrect throat plate position.	Set the throat plate surface 0,30 to 0,50 mm, (0.010 to 0,020") lower than the support plate top surface.
Seams is cut by the CA knife	Cutting width too small.	Correctly increase the cutting width.
	Incorrect knife drop position.	Correct the knife drop position.
	Unequal left and right - hand openings.	Equalize the left and right - hand openibngs.
Incorrect buttonhole quality	Incorrect stitch density.	Correctly set the stitch density.
	Incorrect number of buttonhole eye stitches.	Correct the number of the buttonhole eye stitches.
	Incorrect fabric spread.	Correct the fabric spread.
	Incorrct stitch line and buttonhole axis distance.	Correct the stitch line and buttonhole axis distance.
	Incorrect upper and lower thread tension.	Correct the upper and lowerthread tension.
	Incorrect thread strenght and stretch.	Correctly replace the thread..

TROUBLESHOOTING

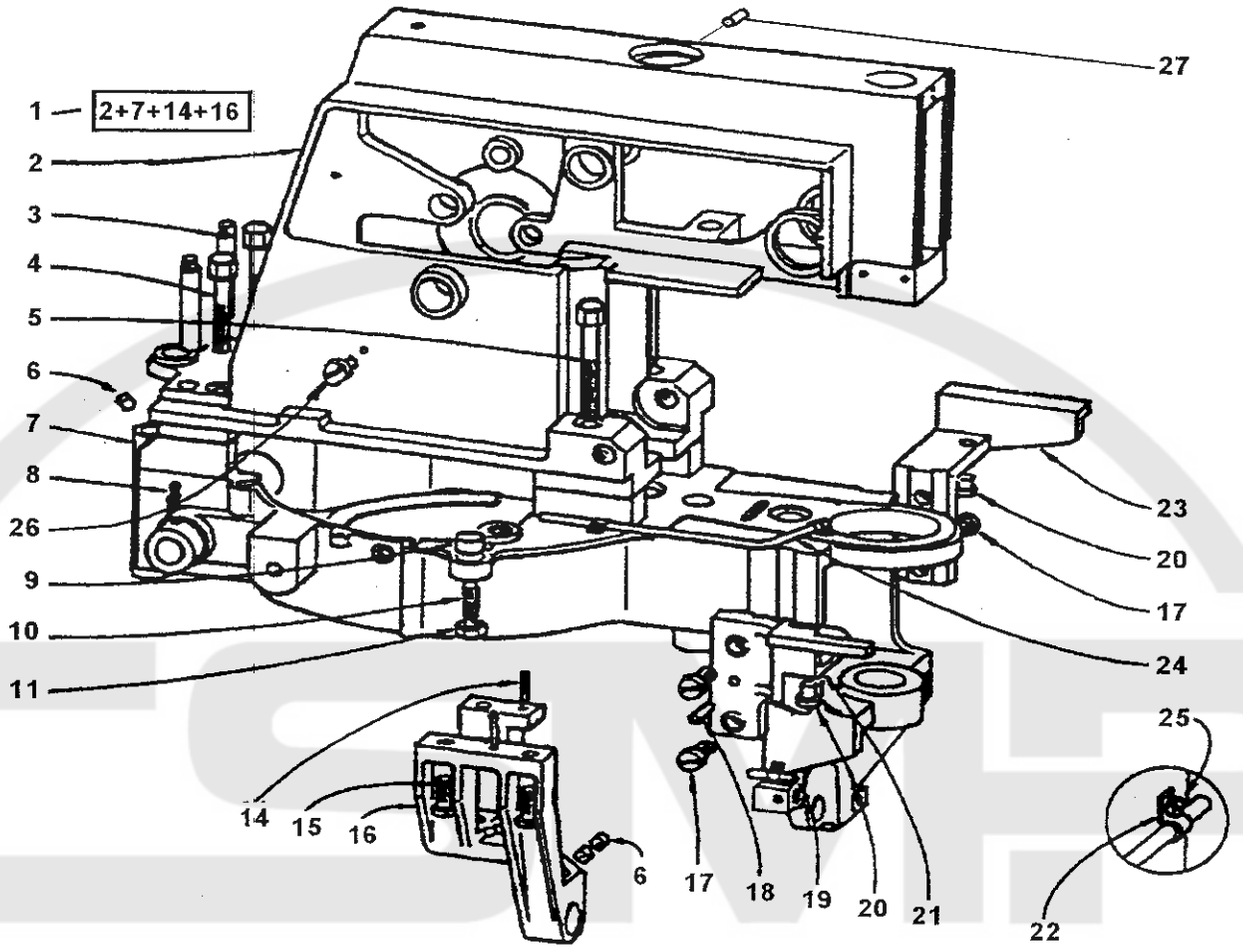
TABLE OF CONTENTS

Page

Head and Cam Case Support 3-1
Covers and Base Assembly 3-2
L.H. Crank and R.H. Belt Pulley 3-4
Main Stitch Shaft 3-5
Bite Adjustment and Barrel 3-6
Needle Bar Drive 3-7
Needle Bar and Gear 3-8
Stitch Shaft and Drive 3-9
Looper and Spreader Drive 3-10
Right & Left Loopers/Spreaders/Spreader Stops 3-11
Race 3-12
Stitch Feed 3-13
Bottom Shaft Assembly 3-14
Main Cam and Brake Band 3-15
Sector Shaft and Guard 3-16
Cutting Lever Assembly 3-17
Lateral Cam Shaft Assembly 3-18
Bedplate Assembly 3-19
Clamp Plate Assembly 3-20
Clamp Yoke Assembly 3-21
Clamping Lever Assembly 3-22
Starting Lever and Switch Lever Assembly 3-23
Three Fork Lever Assembly 3-24
Trip Lever Assembly 3-25
Rocking Lever 3-26
Top Thread Trimmer Assembly 3-27
Take-Up Lever and Top Thread Tension Assembly 3-28
Head 3-29
Top Thread Trimmer Assembly Actuator 3-30
Right Hand Stop Wheel 3-31
Annex 1 Global Accessories 3-32

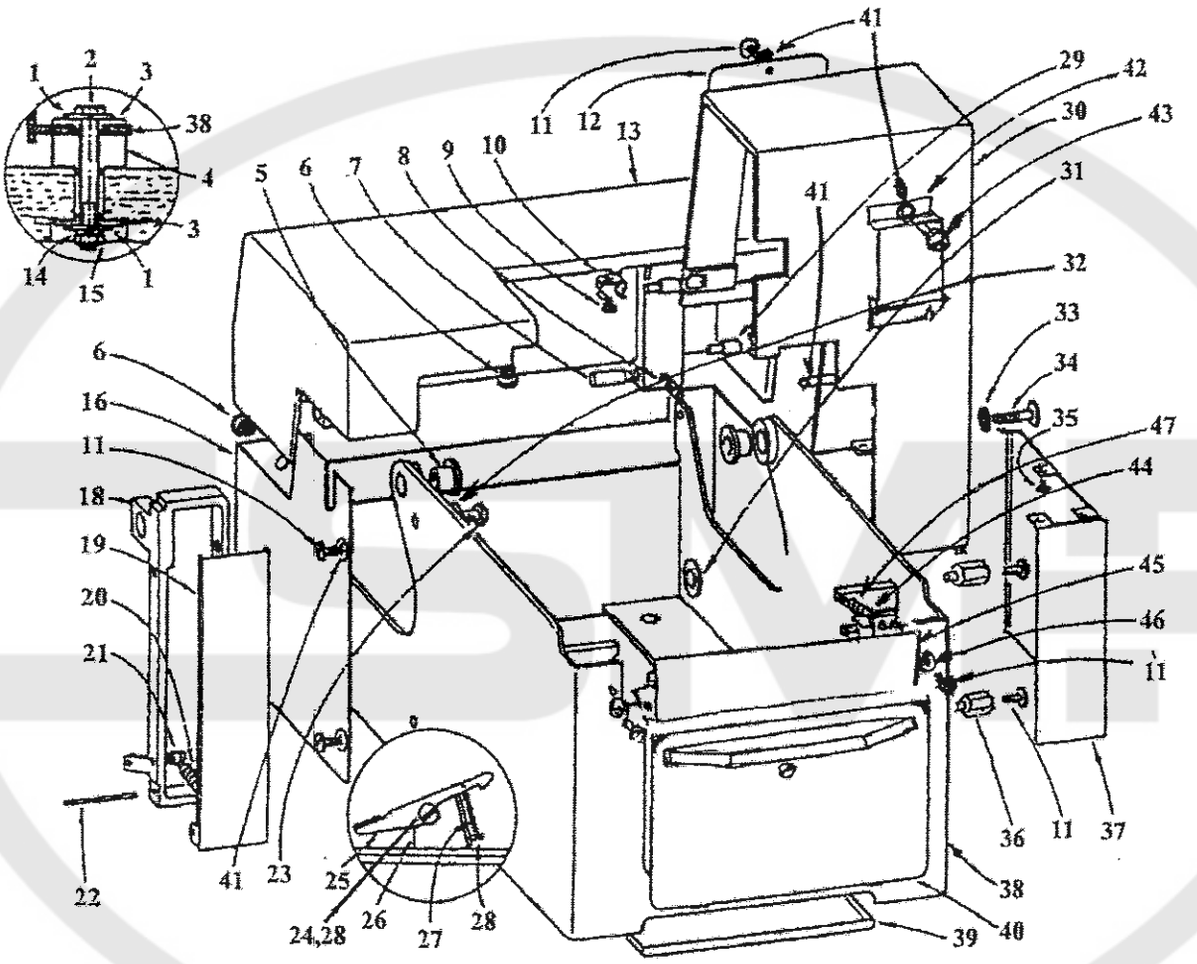
Special Accessories 3-33

HEAD, CAM CASE AND BEDPLATE SUPPORT



DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0002.0.366	Head Assembly	17	08.6000.8.016	Screw
03	17.0031.2.013	Pin	18	17.0031.0.433	Pin
04	17.0014.1.243	Screw	19	17.0084.0.266	Thread Guide
05	17.0014.1.244	Screw	20	17.0094.0.029	Stop
06	17.0094.5.052	Felt	21	17.0074.4.407	Block
08	17.0044.1.443	Screw	22	17.0082.6.000	Clamp
09	17.0019.2.021	Button	23	17.0074.4.464	Arm
10	08.6010.3.006	Screw	24	17.0027.1.416	Tubing
11	17.0016.1.190	Nut	25	08.6010.3.006	Screw
14	17.0031.7.039	Pin	26	22.0124.0.000	Screw
15	08.6000.6.016	Screw	27	17.0011.1.302	Screw M5-8

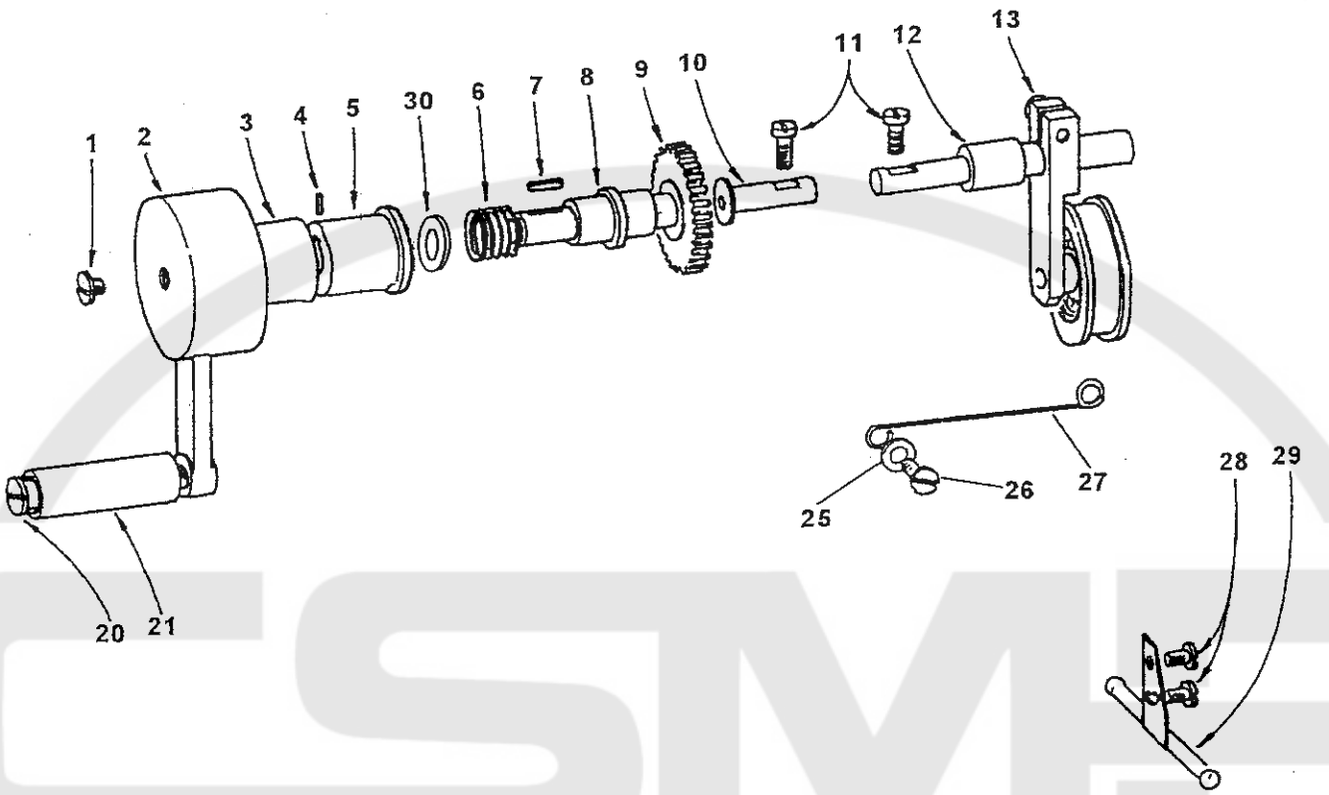
COVERS AND BASE ASSEMBLY



COVERS AND BASE ASSEMBLY

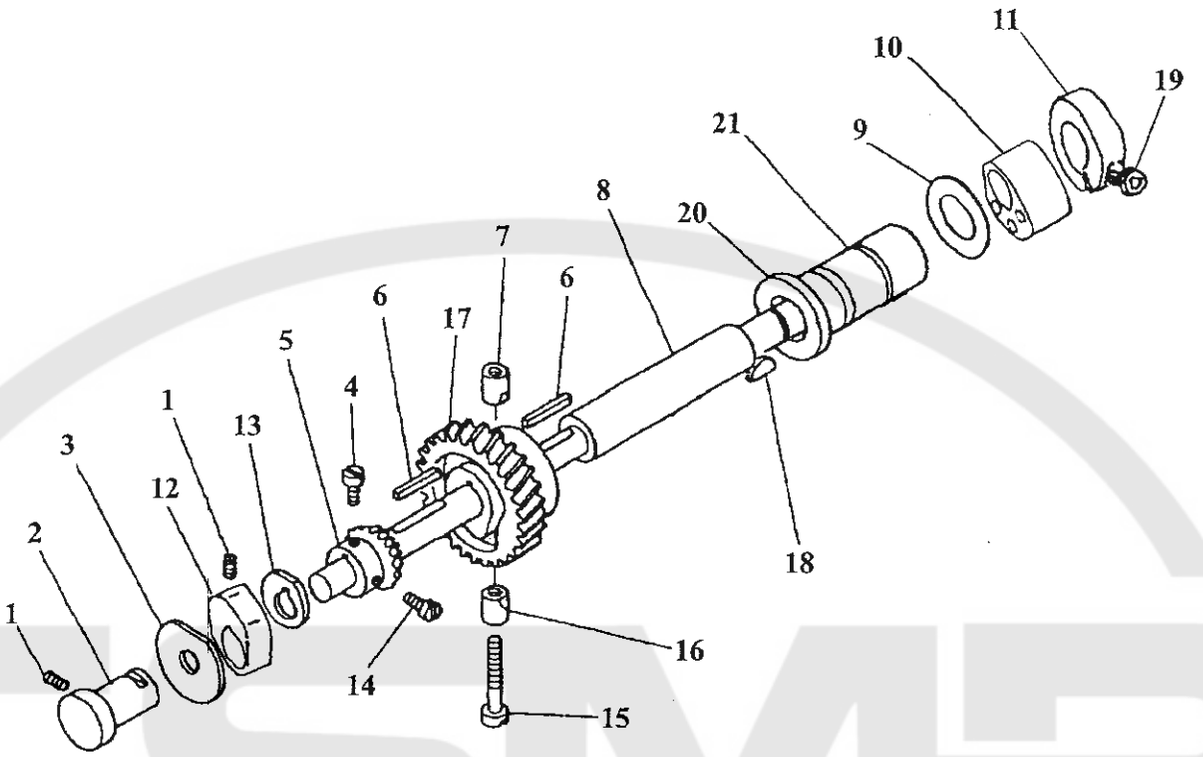
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0019.0.441	Washer	26	17.0083.6.370	Bracket
02	08.6300.8.065	Bolt	27	17.0026.3.231	Spring
03	17.0095.1.272	Washer	28	17.0032.2.030	Pin
04	17.0095.1.273	Rubber	29	17.0094.0.154	Stud
05	17.0095.1.309	Bushing	30	17.0075.4.012	Cover
06	17.0094.0.029	Stop	31	17.0042.1.279	Thread Guide
07	17.0031.3.330	Pin	32	17.0019.0.346	Washer
08	17.0011.1.234	Screw	33	17.0094.1.097	Washer
09	08.6010.3.006	Screw	34	17.0012.4.098	Screw
10	17.0028.3.117	Clip	35	17.0012.0.217	Screw
11	17.0012.4.103	Screw	36	17.0014.6.057	Screw
12	17.0083.1.438	Cover	37	17.0004.1.189	Cover
13	17.0074.6.150	Cover	38	17.0004.8.902	Housing
14	17.0019.1.109	Lockwasher	39	17.0083.3.186	Oil Reservoir
15	17.0016.1.135	Nut	40	17.0004.8.904	Front Cover
16	17.0083.1.650	Cover	41	08.6850.4.000	Washer
18	17.0004.8.900	Bracket	42	17.0083.1.630	Cover
19	17.0083.1.429	Cover	43	08.6200.4.006	Screw
20	17.0026.3.189	Spring	44	17.0064.8.112	Holder
21	17.0013.1.341	Stud	45	17.0083.1.651	Cover
22	17.0031.0.034	Pin	46	08.6850.4.000	Washer
23	17.0014.1.112	Screw	47	17.0026.3.014	Spring
24	08.6310.6.016	Screw	48	17.0044.1.211	Washer
25	17.0081.0.421	Lever			

L.H. CRANK AND R.H. BELT PULLEY



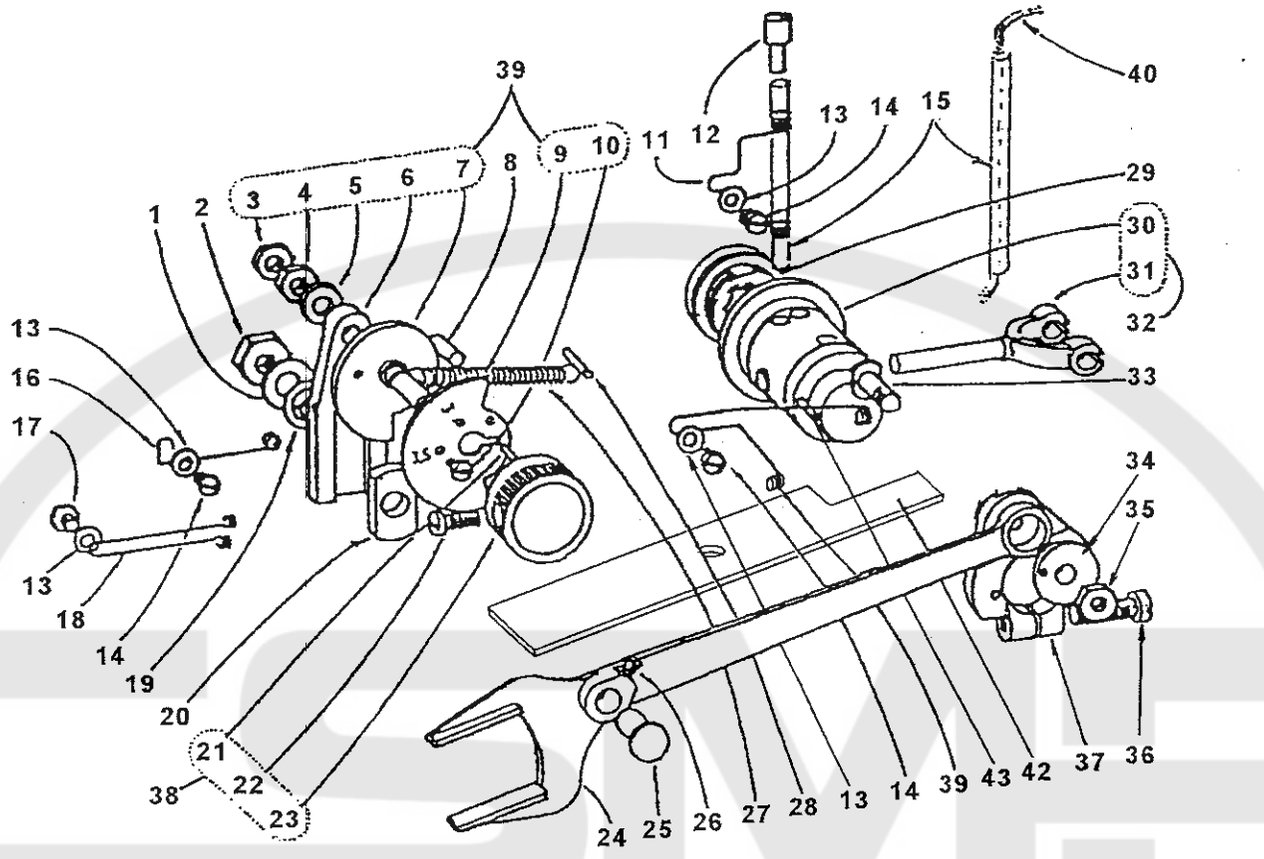
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0012.4.042	Screw	12	17.0033.2.133	Bushing
2	17.0063.5.184	Crank	13	17.0004.3.485	Plate
3	17.0002.4.140	Feed Clutch	20	17.0013.1.343	Screw
4	17.0031.0.480	Pin	21	17.0041.2.149	Roll
5	17.0042.5.256	Collar	25	08.6850.4.000	Washer
6	17.0026.0.481	Spring	26	17.0012.0.227	Screw
7	17.0021.1.068	Key	27	17.0027.1.463	Thread Guide
8	17.0042.4.120	Bushing	28	17.0012.0.217	Screw
9	17.0055.1.153	Gear	29	17.0002.5.241	Tubing
10	17.0032.0.193	Shaft	30	17.0019.0.602	Washer
11	08.6010.5.012	Screw			

MAIN STITCH SHAFT



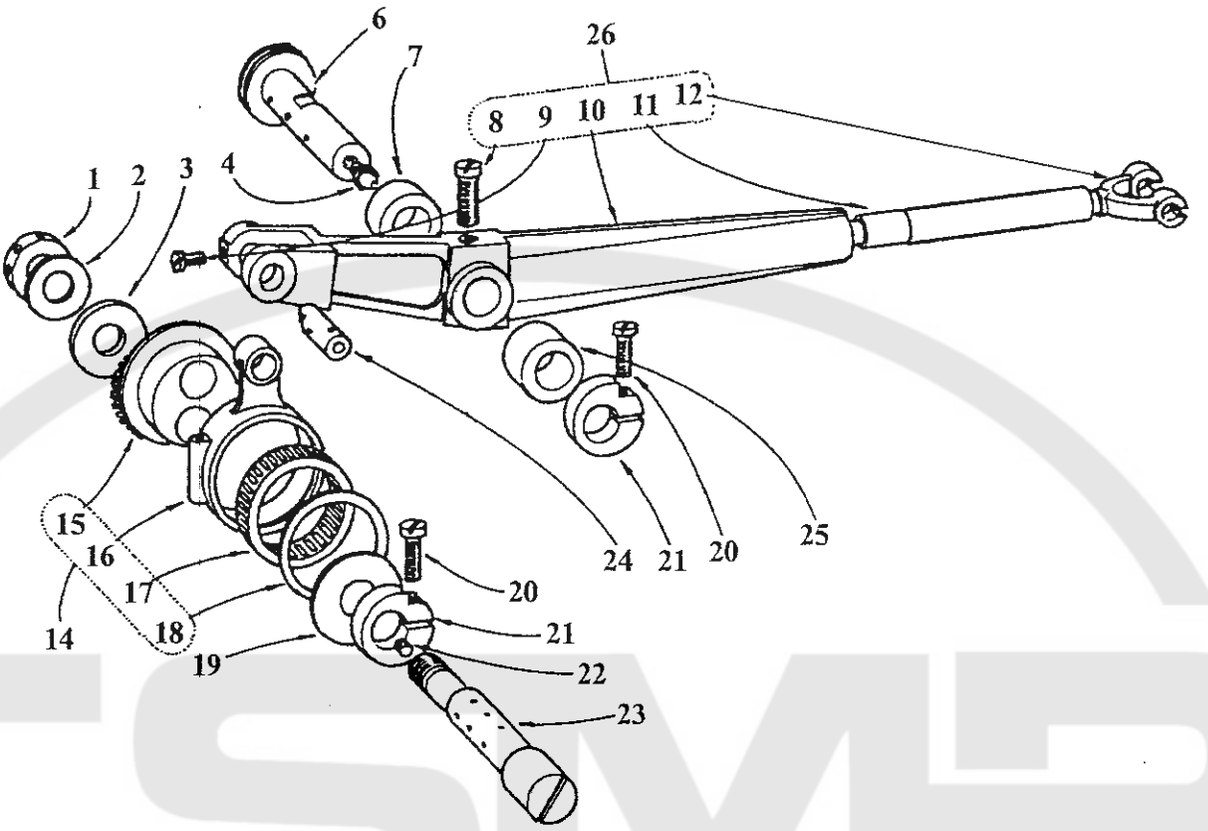
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0011.1.261	Screw	12	17.0067.2.098	Counterweight
02	17.0041.5.030	Shaft Bushing	13	17.0081.8.377	Washer
03	17.0081.4.376	Washer	14	17.0013.2.120	Screw
04	17.0013.2.119	Screw	15	17.0012.0.114	Screw
05	18.0056.2.117	Gear	16	17.0041.0.232	Bushing
06	17.0021.1.070	Key	17	17.0055.2.172	Gear
07	17.0043.1.011	Roll	18	17.0021.1.045	Key
08	17.0034.9.201	Shaft	19	08.6000.5.012	Screw
09	17.0019.0.605	Washer	20	17.0042.5.280	Bushing
10	17.0067.2.411	Vibrator Cam	21	12.2050.1.001	Needle Bearing
11	17.0043.6.280	Clamp Collar			

BITE ADJUSTMENT AND BARREL



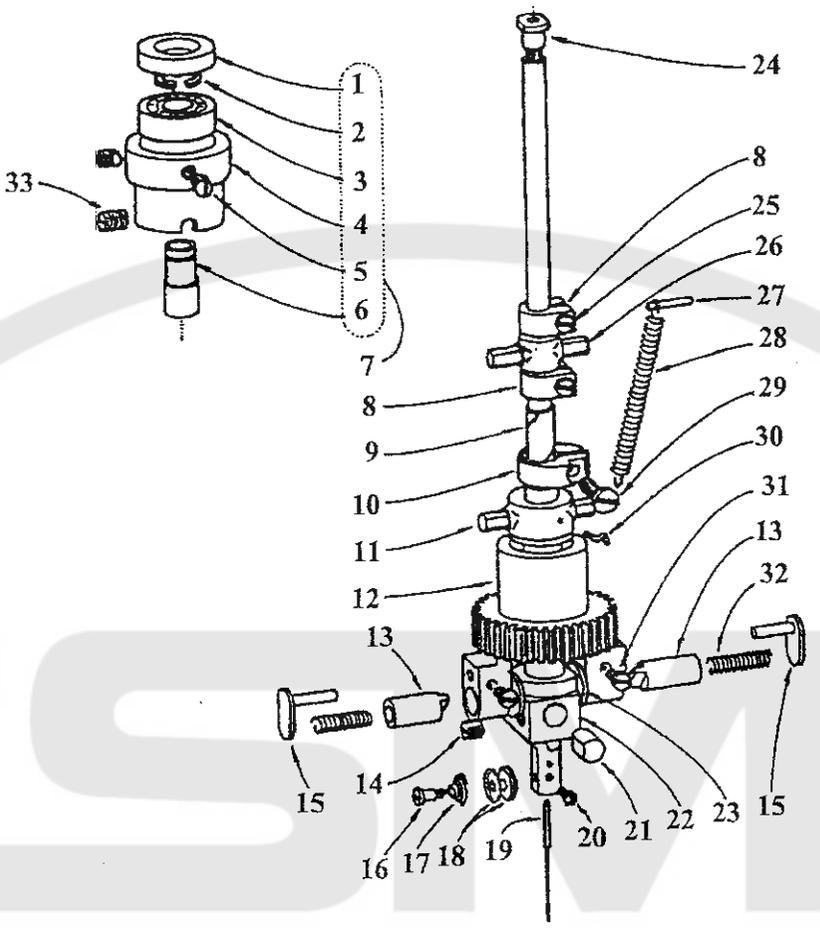
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0019.0.364	Washer	23	17.0044.2.534	Knob
2	17.0016.1.190	Nut	24	17.0063.4.169	Fork Lever
3	17.0016.1.140	Nut	25	17.0032.0.194	Stud
4	17.0016.1.142	Nut	26	17.0011.1.230	Screw
5	17.0019.2.061	Washer	27	17.0026.3.123	Spring
6	17.0064.1.090	Bracket	28	17.0031.0.199	Pin
7	17.0004.9.858	Eccentric	29	17.0095.1.329	Wheel
8	18.0031.3.401	Pin	30	17.0003.5.483	Barrel
9	17.0081.4.313	Limiter	31	17.0063.4.172	Yoke Fork
10	17.0012.0.215	Screw	32	17.0003.5.431	Yoke Asm.
11	17.0027.1.799	Spring	33	17.0012.0.576	Stud
12	17.0042.1.282	Bushing	34	17.0067.1.025	Eccentric
13	08.6850.4.000	Washer	35	08.6700.6.300	Nut
14	17.0012.0.217	Screw	36	17.0012.1.169	Screw
15	17.0094.2.092	Tubing	37	17.0063.6.070	Clamp
16	17.0027.1.411	Wick Guide	38	17.0004.4.819	Knob Asm.
17	08.6310.4.006	Screw	39	17.0002.6.188	Bracket Asm.
18	17.0027.1.412	Wick Guide	40	17.0094.5.318	Wick 3mm Dia. (not shown)
19	17.0019.0.517	Washer	41	17.0027.1.413	Wick Guide
20	17.0045.1.099	Block	42	17.0097.5.366	Felt
21	17.0031.0.428	Pin	43	17.0031.0.425	Pin
22	08.6000.4.010	Screw	44		

NEEDLE BAR DRIVE



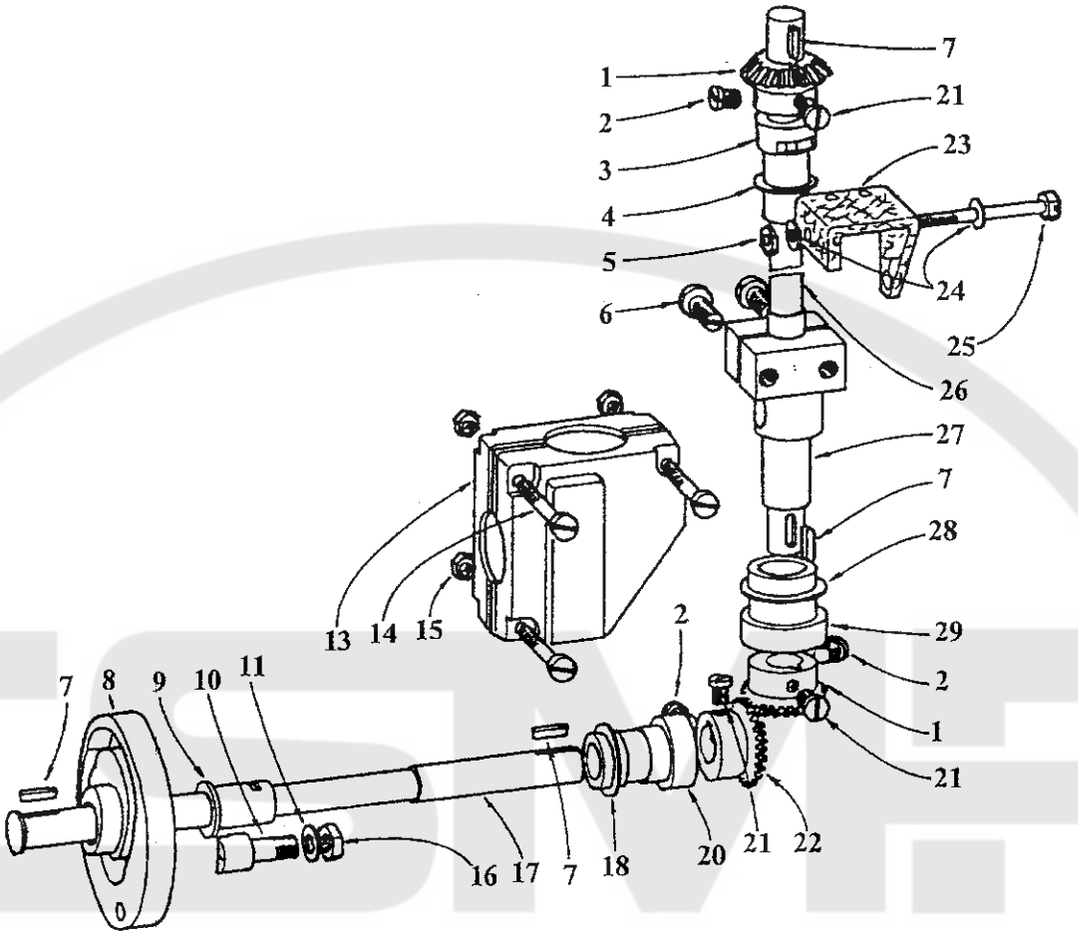
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0017.4.058	Nut	15	17.0003.5.475	Eccentric
02	17.0019.0.371	Washer	16	17.0063.0.253	Rick Link
03	17.0019.0.225	Washer	17	12.2050.0.000	Bearing
04	17.0004.7.242	Screw	18	17.0019.2.077	Washer
06	17.0033.0.102	Pin	19	17.0081.4.375	Washer
07	17.0041.0.551	Roll	20	17.0012.0.543	Screw
08	17.0012.2.031	Screw	21	17.0043.6.351	Clamp
09	17.0012.0.290	Screw	22	17.0011.1.230	Screw
10	17.0063.6.257	Needle Bar Lever	23	17.0033.5.127	Shaft Eccentric
11	17.0041.2.160	Bushing	24	17.0031.4.205	Shaft
12	17.0063.4.166	Yoke	25	17.0041.0.548	Roll
14	17.0003.5.479	Needle Drive Bearing Asm.	26	17.0004.4.797	Needle Bar Lever Asm.

NEEDLE BAR AND GEAR



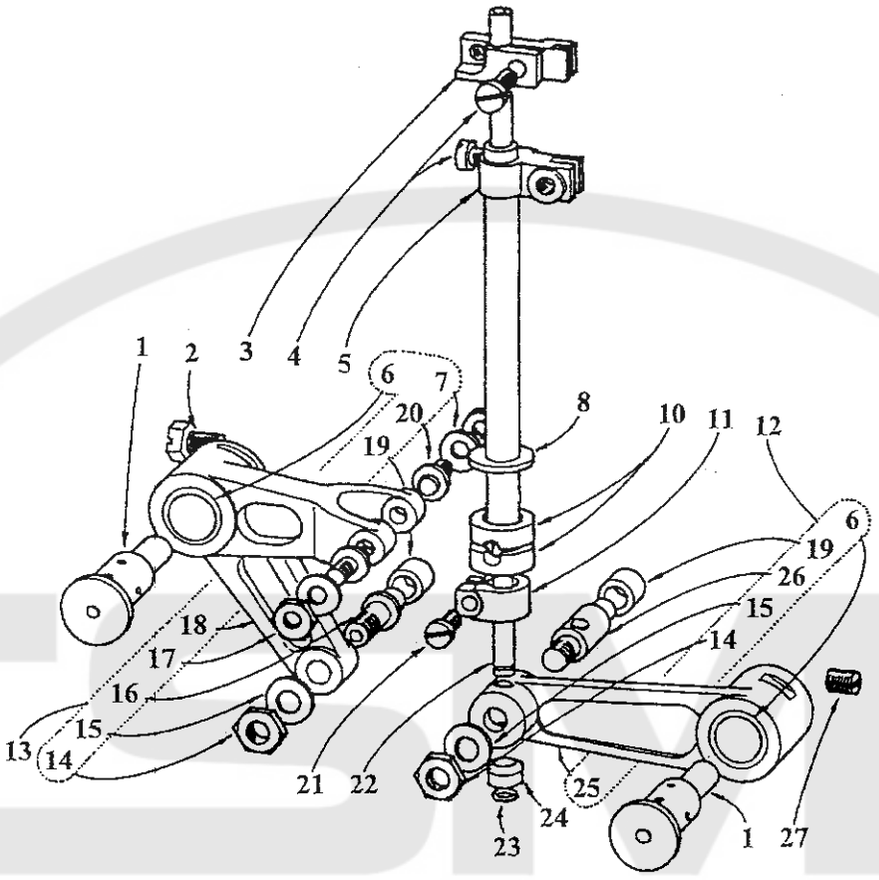
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0044.2.229	Washer	18	17.0082.8.017	Tension Disc
02	17.0027.4.085	Lockwasher	19	02.0501.0.011	Needle
03	12.2010.1.001	Bushing		02.0503.3.113	Needle
04	17.0042.2.149	Guide	20	17.0012.0.570	Needle Screw
05	17.0011.2.107	Screw	21	17.0031.5.041	Button
06	17.0042.1.283	Bushing	22	17.0041.6.129	Needle Bar Guide
07	17.0002.7.563	Upper Needle Bar Asm.	23	17.0019.1.062	Retainer Washer
08	17.0043.6.277	Clamp	24	17.0042.2.216	Thread Draw-off
09	17.0002.1.274	Needle Bar	25	17.0012.0.120	Screw
10	17.0043.6.351	Clamp	26	17.0045.3.004	Gimbal
11	17.0045.3.006	Gimbal	27	17.0031.0.196	Pin
12	17.0055.5.042	Gear	28	17.0026.3.014	Spring
13	17.0031.3.027	Guide	29	17.0012.0.543	Screw
14	08.6400.5.305	Screw	30	17.0027.1.073	Pin
15	10.1021.2.000	Retainer	31	17.0012.0.423	Screw
16	17.0015.2.053	Screw	32	17.0026.1.084	Spring
17	17.0026.2.077	Tension Spring	33	17.0011.1.234	Screw

STITCH SHAFT AND DRIVE



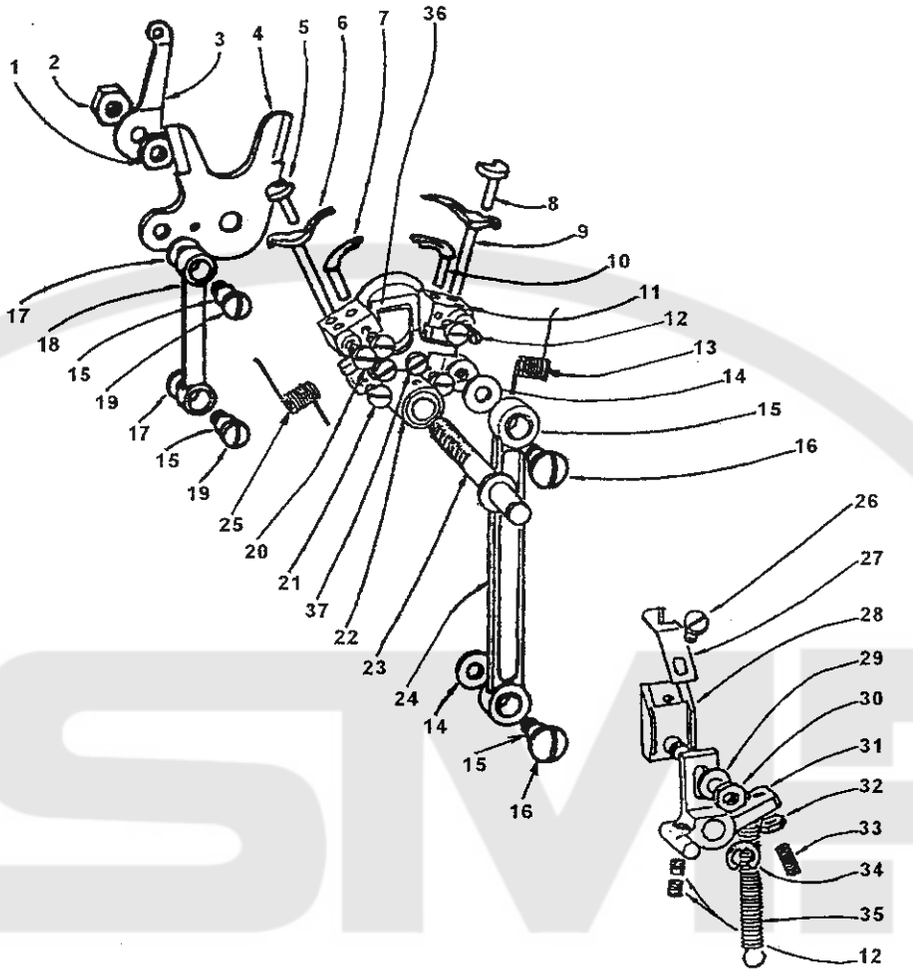
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	18.0056.2.118	Bevel Gear	16	17.0016.1.179	Nut
02	17.0013.2.120	Screw	17	17.0032.2.282	Shaft
03	17.0042.5.287	Bearing	18	17.0019.0.222	Washer
04	17.0019.0.226	Washer	20	17.0042.5.247	Bushing
05	17.0016.1.165	Nut	21	17.0013.2.119	Screw
06	17.0012.0.113	Screw	22	18.0056.2.117	Gear
07	17.0021.1.069	Key	23	17.0094.5.308	Bracket
08	17.0067.5.152	Stitch Cam	24	08.6850.4.000	Washer
09	17.0042.5.288	Bushing	25	08.6000.4.045	Screw
10	17.0033.3.138	Stud	26	17.0034.6.039	Shaft
11	08.6850.5.000	Washer	27	17.0032.2.272	Shaft Clamp
13	17.0004.6.939	Housing	28	17.0019.0.221	Washer
14	17.0012.0.301	Screw	29	17.0042.5.249	Bushing
15	17.0016.1.137	Nut			

LOOPER AND SPREADER DRIVE



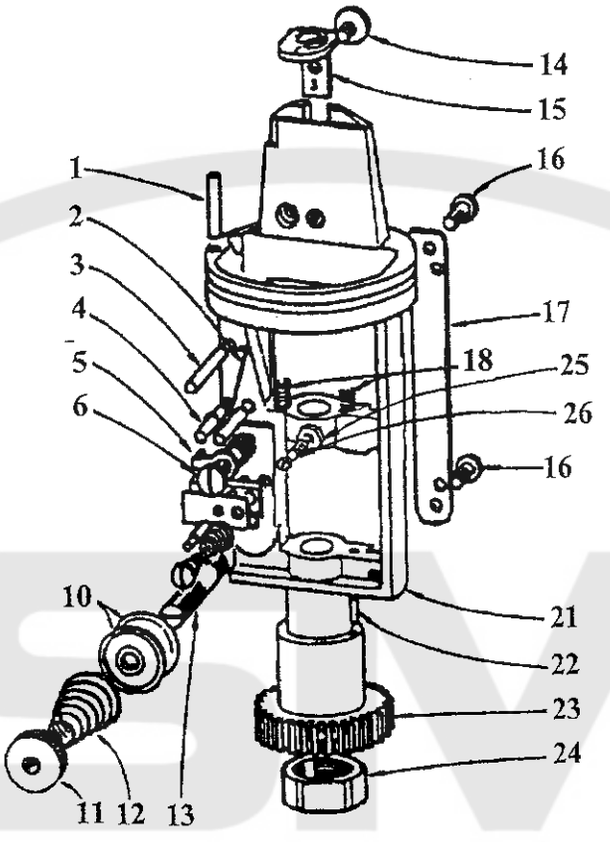
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0032.2.268	Stud	15	17.0019.0.346	Washer
02	17.0014.1.015	Screw	16	17.0033.3.129	Stud
03	17.0064.6.117	Clamp	17	17.0016.1.143	Nut
04	08.6010.4.012	Screw	18	17.0063.6.256	Looper Lever
05	17.0074.4.405	Clamp	19	17.0041.8.096	Roll
06	17.0041.0.550	Bushing	20	17.0033.3.131	Stud
07	08.6850.5.000	Washer	21	08.6010.4.010	Screw
08	17.0004.9.850	Shaft Asm.	22	17.0084.1.226	Shaft
10	17.0019.0.398	Bushing	23	17.0027.4.045	Clip Ring
11	17.0043.6.352	Clamp	24	17.0042.6.053	Roll
12	17.0004.4.795	Lever Assembly	25	17.0061.2.336	Lever
13	17.0004.4.793	Lever Assembly	26	17.0033.2.126	Stud
14	17.0016.1.140	Nut	27	17.0011.2.013	Screw

RIGHT & LEFT LOOPERS / SPREADERS / SPREADER STOPS



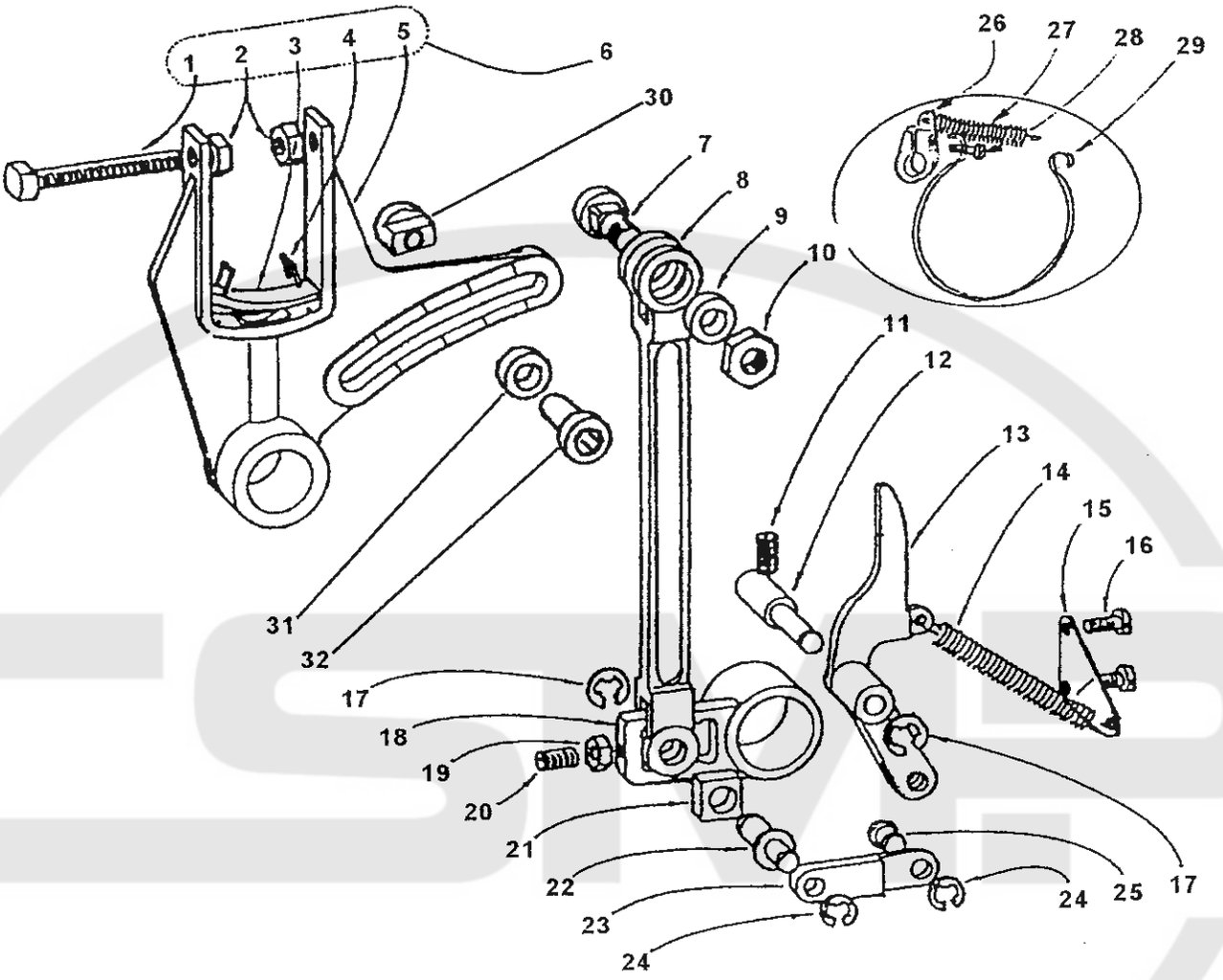
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0016.1.149	Nut	20	08.6010.3.006	Screw
2	17.0016.1.179	Nut	21	17.0012.1.139	Screw
3	17.0082.1.027	Thread Guide	22	17.0003.5.711	Looper Carrier
4	18.0081.8.706	Spreader Wedge	23	17.0033.3.158	Stud
5	17.0033.8.089	L.H. Spreader Stop	24	17.0004.4.829	Looper Link
6	17.0004.9.895	Forked Spreader	25	17.0026.4.293	L.H. Spring
7	17.0069.4.049	Eye Looper	26	17.0012.0.605	Screw
8	17.0033.8.088	R.H. Spreader Stop	27	17.0087.0.204	Knife
9	17.0004.9.894	R.H. Spreader	28	17.0003.5.721	Knife Holder
10	17.0069.4.048	Blind Looper	29	08.6850.4.000	Washer
11	17.0003.5.711	Looper Carrier	30	17.0016.1.165	Nut
12	17.0011.1.248	Screw	31	17.0064.6.336	Lever
13	17.0026.4.292	R.H. Spring	32	08.6710.3.000	Nut
14	17.0019.1.088	Washer	33	17.0011.1.249	Screw
15	17.0041.1.094	Roll	34	17.0027.4.090	Lockwasher
16	17.0012.1.142	Screw	35	17.0026.3.173	Spring
17	17.0019.0.228	Washer	36	17.0082.5.898	Needle Guard
18	17.0063.1.073	Spreader Link	37	17.0012.0.404	Screw
19	17.0012.1.140	Stud			

RACE



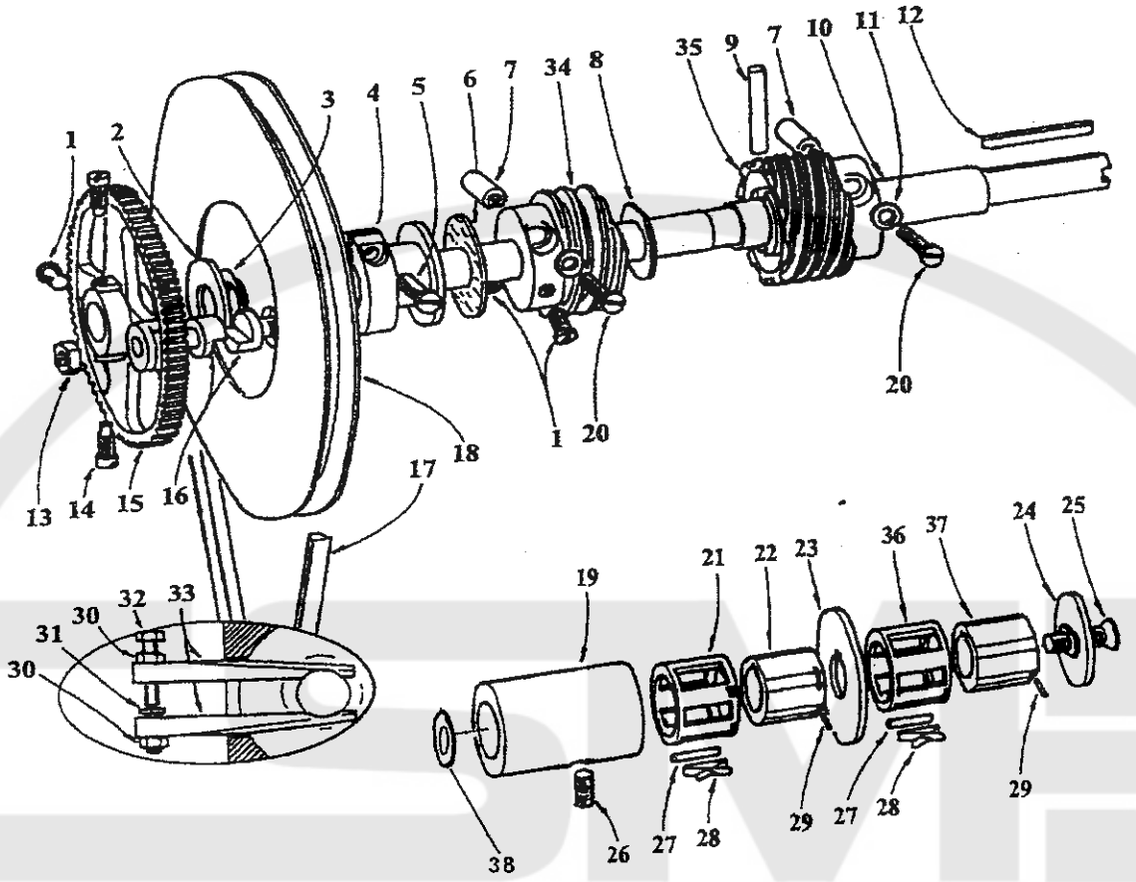
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0084.1.001	Thread Guide	15	17.0064.7.263	Throat Plate*AF
02	17.0026.4.035	Spring	16	17.0012.0.290	Screw
03	17.0031.0.428	Pin	17	17.0081.5.003	Bracket
04	17.0031.0.426	Pin	18	17.0026.0.215	Spring
05	17.0064.7.162	Plate	21	17.0073.1.018	Race
06	08.6010.4.012	Screw	22	17.0031.0.406	Pin
10	17.0082.8.084	Tension Plate	23	17.0055.1.158	Gear
11	17.0017.1.016	Nut	24	17.0016.1.093	Nut
12	17.0026.2.078	Tension Spring	25	17.0016.1.165	Nut
13	17.0011.8.041	Stud	26	17.0031.6.063	Screw
14	17.0012.1.137	Screw			

STITCH FEED



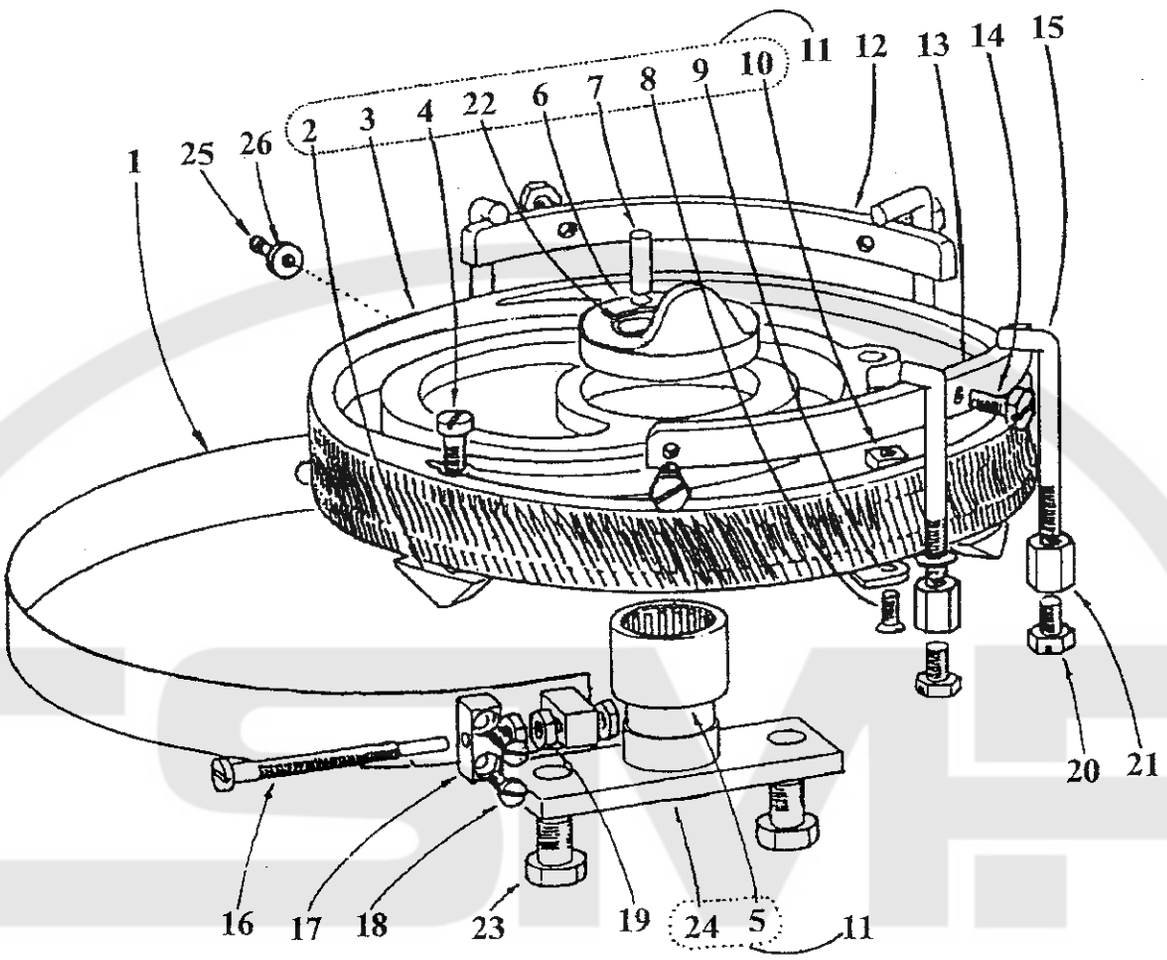
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0014.4.036	Screw	17	17.0027.4.084	Lockwasher
2	08.6700.6.300	Nut	18	17.0064.1.089	Lever Guide
3	17.0094.5.307	Wicking	19	17.0016.1.146	Nut
4	17.0027.1.410	Clamp	20	17.0011.1.242	Screw
5	17.0063.6.260	Stitch Feed	21	17.0064.6.122	Block
6	17.0004.4.806	Stitch Feed Assembly	22	17.0032.3.162	Stud
7	17.0032.5.031	Stud	23	17.0061.2.343	Bracket
8	17.0063.2.154	Link	24	17.0027.4.083	Lockwasher
9	17.0041.0.554	Roll	25	17.0032.0.261	Stud
10	17.0016.1.190	Nut	26	17.0043.6.437	Clamp
11	17.0011.1.240	Screw	27	17.0026.3.245	Spring
12	17.0034.9.155	Shaft	28	17.0012.0.516	Screw
13	17.0063.3.195	Lever	29	17.0027.1.503	Brake
14	17.0026.3.013	Spring	30	17.0016.3.051	Nut
15	17.0082.5.869	Plate	31	17.0019.0.346	Washer
16	17.0012.0.218	Screw	32	17.0012.0.457	Screw

BOTTOM SHAFT ASSEMBLY



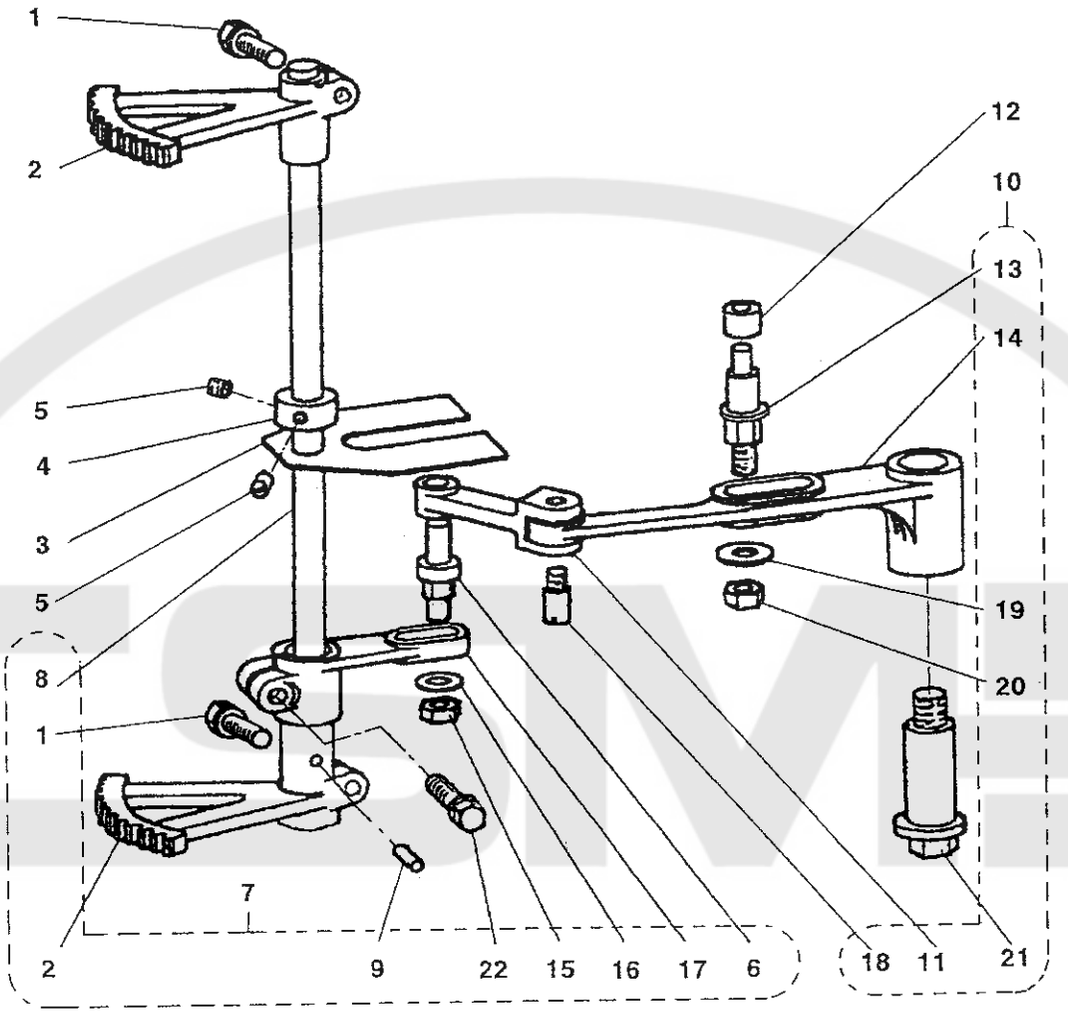
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0013.2.192	Screw	20	08.6000.4.025	Screw
02	17.0094.1.143	Bushing	21	17.0044.1.325	Bearing
03	17.0019.0.610	Washer	22	17.0045.9.059	Bearing Housing
04	17.0044.5.114	Spool	23	17.0019.5.049	Washer
05	17.0012.0.232	Screw	24	17.0019.6.033	Lockwasher
06	17.0094.3.142	Washer	25	17.0012.6.149	Screw
07	17.0021.0.018	Nut	26	17.0011.1.240	Screw
08	17.0019.1.063	Washer	27	12.2099.1.007	Needle Bearing
09	17.0031.0.434	Pin	28	17.0028.3.102	Clip
10	17.0034.9.156	Drive Shaft	29	17.0031.0.328	Pin
11	17.0019.0.469	Washer	30	17.0016.1.179	Nut
12	17.0021.1.071	Key	31	17.0012.7.007	Screw
13	17.0016.1.190	Nut	32	17.0014.2.011	Screw
14	17.0013.2.090	Screw	33	17.0074.4.451	Clamp
15	17.0055.1.152	Wheel	34	17.0057.0.056	Friction Collar
16	17.0033.5.113	Dog	35	17.0057.0.057	Gear
17	12.5050.1.500	Cutting Wheel Belt	36	17.0044.1.618	Bearing
18	17.0052.0.315	Pulley	37	17.0045.9.048	Bearing Housing
19	17.0042.6.054	Bushing	38	17.0094.3.141	Washer

MAIN CAM AND BRAKE BAND



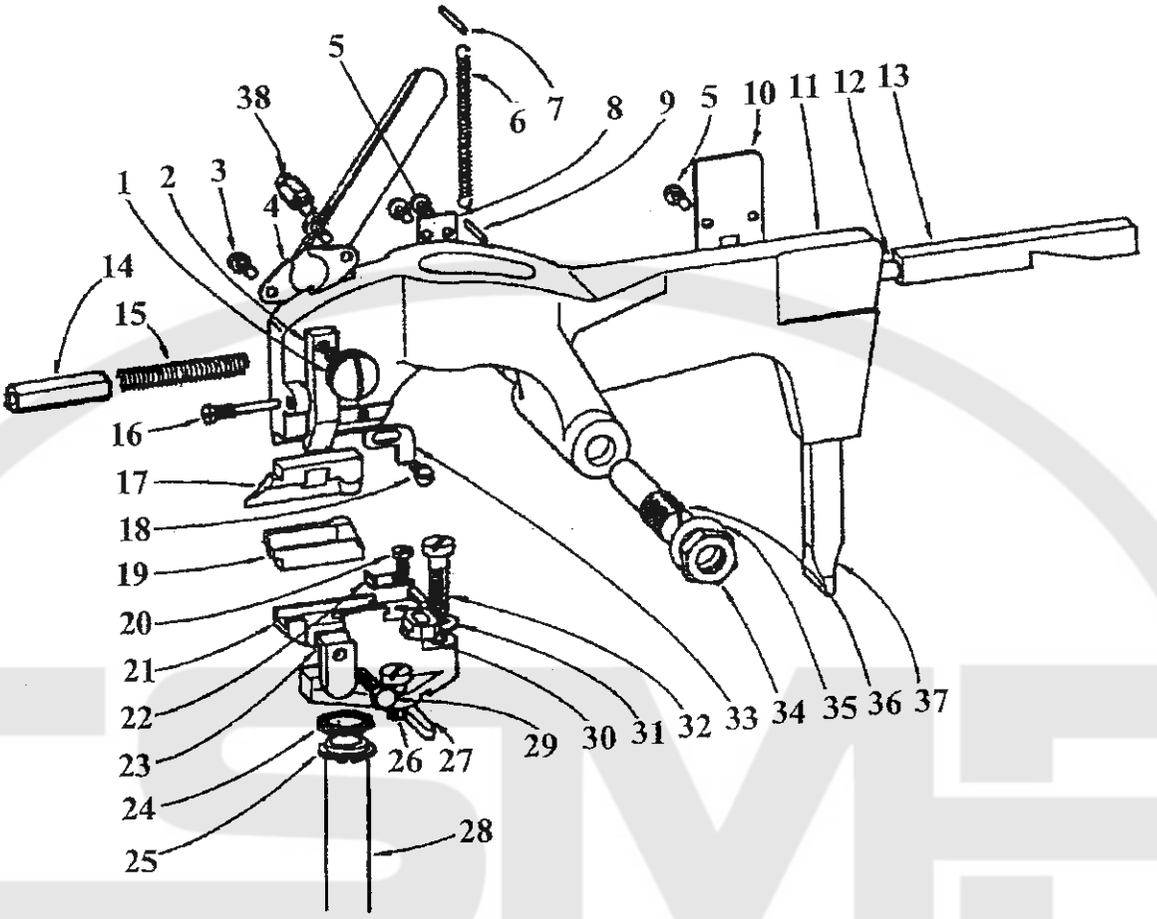
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0002.7.589	Brake Band	14	08.6000.5.012	Screw
02	17.0062.5.019	Clamping Wedge	15	17.0038.2.012	Hook
03	17.0067.4.127	Main Cam	16	17.0012.0.549	Screw
04	08.6000.5.010	Screw	17	17.0064.5.947	Block
05	12.2050.1.002	Roller Bearing	18	08.6000.4.012	Screw
06	17.0067.2.164	Cutting Cam	19	17.0016.1.179	Nut
07	17.0031.0.431	Pin	20	17.0014.1.015	Screw
08	08.6100.4.010	Screw	21	17.0016.1.045	Nut
09	17.0082.5.563	Clamp	22	17.0027.4.148	Wire Snap Ring
10	17.0016.2.003	Nut	23	17.0014.1.285	Screw
11	17.0002.7.575	Cam Assembly	24	17.0004.9.929	Base Assembly
12	17.0081.3.957	Hold Down	25	17.0012.6.110	Screw
13	17.0081.3.960	Hold Down	26	17.0044.1.582	Washer

SECTOR SHAFT AND GUARD



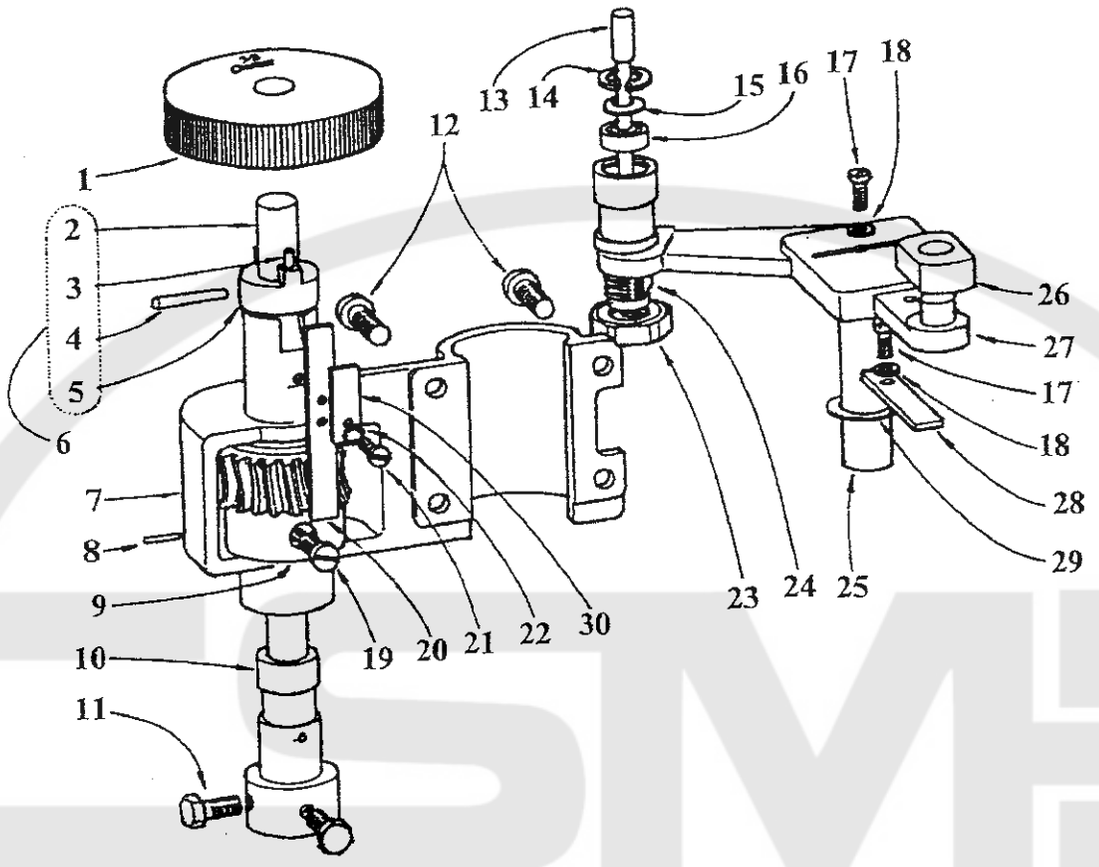
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0011.7.009	Screw	12	17.0041.8.181	Roll
02	17.0055.3.025	Upper Sector	13	17.0032.3.196	Stud
03	17.0083.1.096	Plate	14	17.0063.6.265	Lower Lateral Lever
04	17.0043.6.018	Roll	15	17.0016.1.182	Nut
05	08.6400.5.305	Screw	16	17.0019.0.364	Washer
06	17.0033.3.132	Stud	17	17.0063.6.308	Lower Lever
07	17.0006.0.152	Bracket Rotary Gear Asm.	18	17.0033.1.153	Screw
08	17.0034.2.328	Shaft	19	17.0019.0.371	Washer
09	17.0031.2.029	Pin	20	17.0016.1.290	Nut
10	17.0004.4.559	Lever Change Asm.	21	17.0033.5.137	Stud
11	17.0063.6.044	Fork	22	17.0014.1.180	Screw

CUTTING LEVER ASSEMBLY



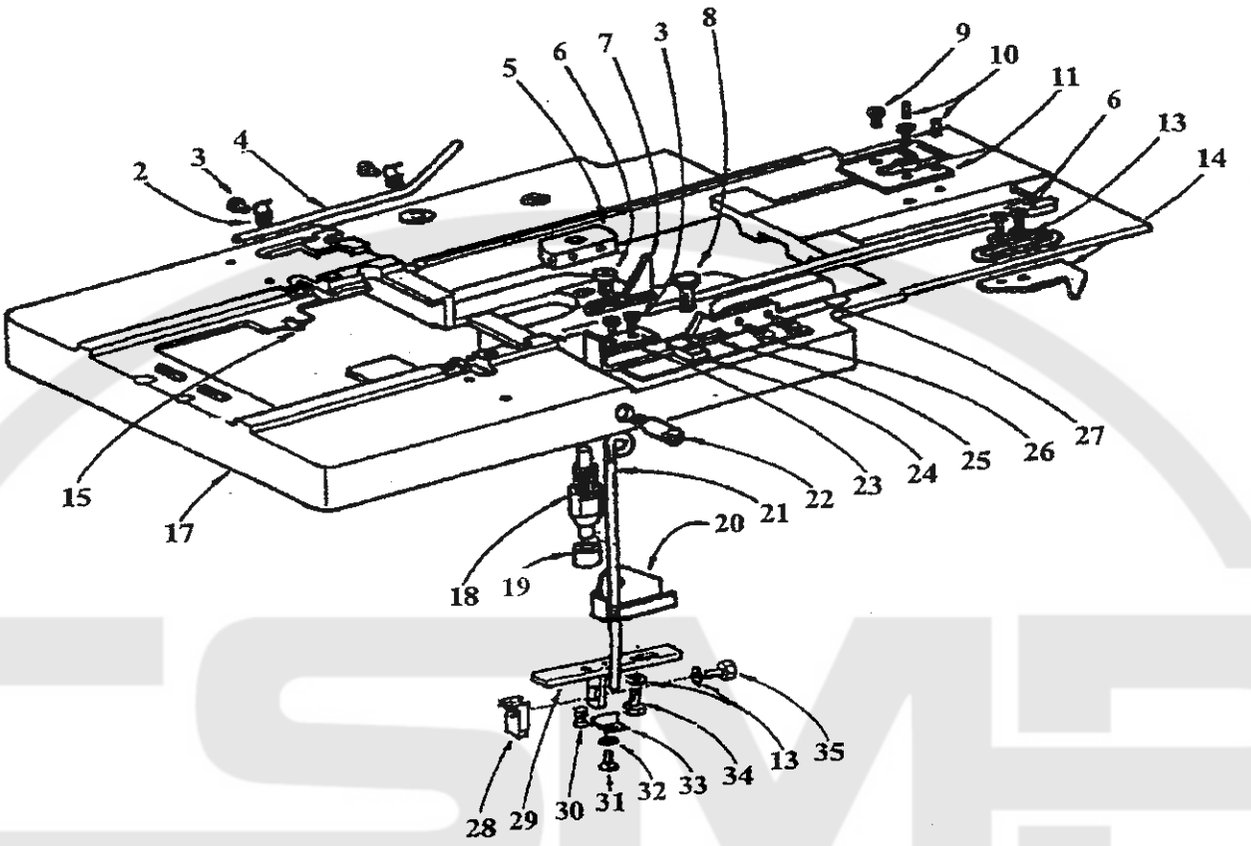
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0013.4.027	Screw	20	17.0012.0.246	Screw
02	17.0063.6.220	Knife Holder	21	17.0074.4.504	Knife Holder
03	17.0012.0.331	Screw	22	17.0082.4.545	Stop
04	17.0002.7.584	Lever	23	17.0064.6.416	Knife Clamp
05	17.0012.0.328	Screw	24	17.0094.3.085	Ring
06	17.0026.3.013	Spring	25	17.0027.4.127	Lockwasher
07	17.0031.0.427	Pin	26	08.6010.5.012	Screw
08	17.0028.1.125	Plate	27	17.0021.1.073	Key
09	17.0031.0.405	Pin	28	17.0084.1.228	Shaft
10	17.0082.5.108	Cover Plate	29	17.0014.1.066	Screw
11	17.0063.5.234	Cutting Lever	30	17.0064.5.170	Spreader Block
12	17.0011.5.019	Shaft	31	17.0019.0.346	Washer
13	17.0064.6.298	Pressure Bar	32	17.0012.0.425	Screw
14	17.0016.1.260	Nut	33	17.0082.5.997	Clamp
15	17.0026.1.082	Spring	34	17.0016.1.288	Nut
16	17.0013.1.415	Screw	35	17.0019.0.560	Washer
17	18.0087.0.405	Eye Knife 3/5 CA	36	17.0011.3.113	Stud
18	17.0012.0.571	Screw	37	17.0062.5.149	Cam Follower
19	See Page 3-33	Cutting Steel	38	17.0033.2.143	Stud

LATERAL CAM SHAFT ASSEMBLY



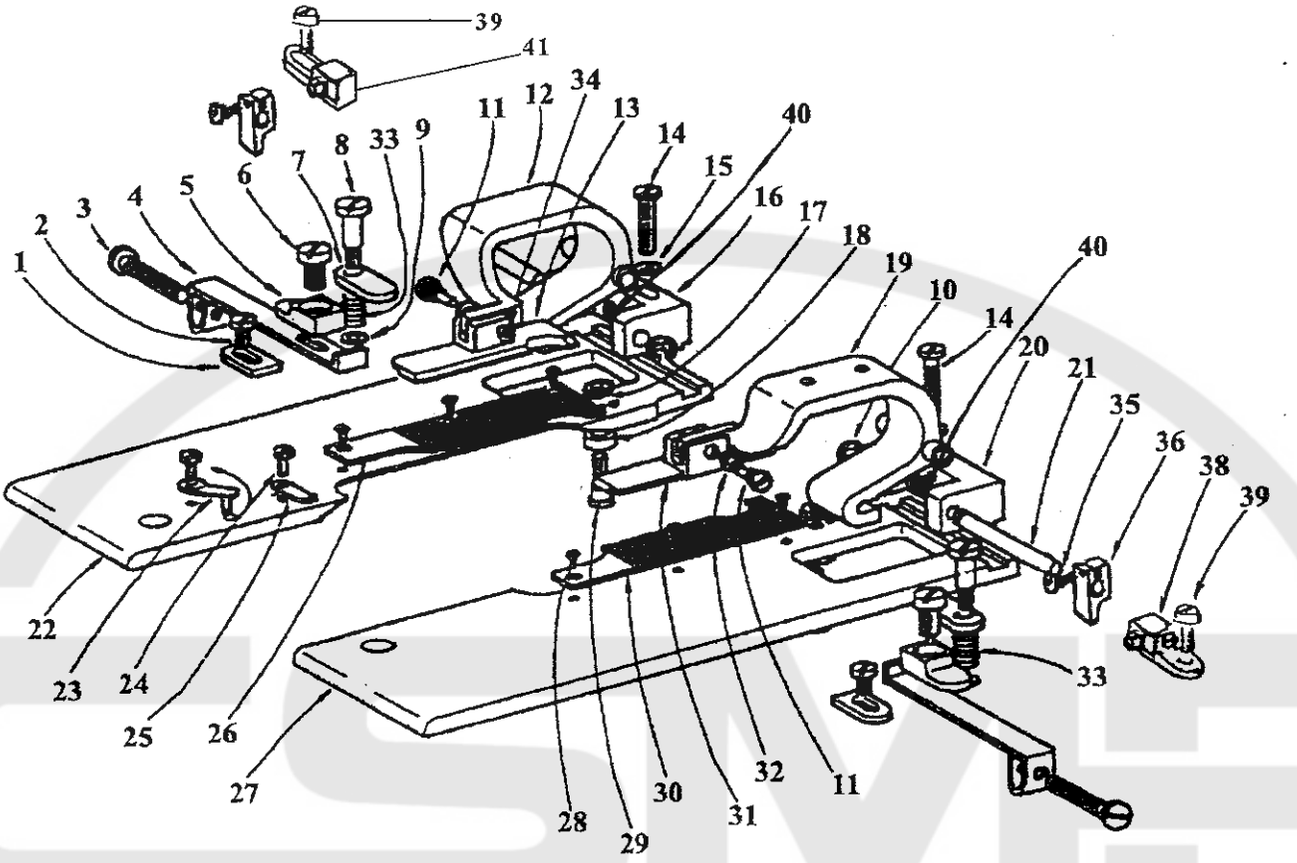
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0067.4.102	Lateral Cam	16	12.2010.0.002	Bearing
02	17.0034.2.219	Shaft	17	08.6010.4.010	Screw
03	17.0031.0.425	Pin	18	08.6850.4.000	Washer
04	17.0031.2.024	Pin	19	17.0013.2.090	Screw
05	17.0064.7.226	Shaft Washer	20	17.0094.5.310	Felt
06	17.0004.3.259	Lateral Cam Shaft Asm.	21	17.0013.6.032	Screw
07	17.0074.4.421	Housing	22	17.0019.2.061	Curved Spring Washer
08	17.0031.0.429	Pin	23	17.0016.1.093	Nut
09	17.0057.1.045	Gear	24	17.0044.2.225	Bushing
10	17.0042.5.041	Bushing	25	17.0004.4.557	Upper Lateral Lever
11	17.0014.1.033	Screw	26	17.0045.1.106	Slide Block
12	08.6000.6.016	Screw	27	17.0032.1.074	Stud
13	17.0034.2.145	Stud	28	17.0094.5.311	Plate
14	17.0027.4.129	Lockwasher	29	17.0019.0.222	Washer
15	17.0044.2.224	Washer	30	17.0081.5.002	Plate

BEDPLATE ASSEMBLY



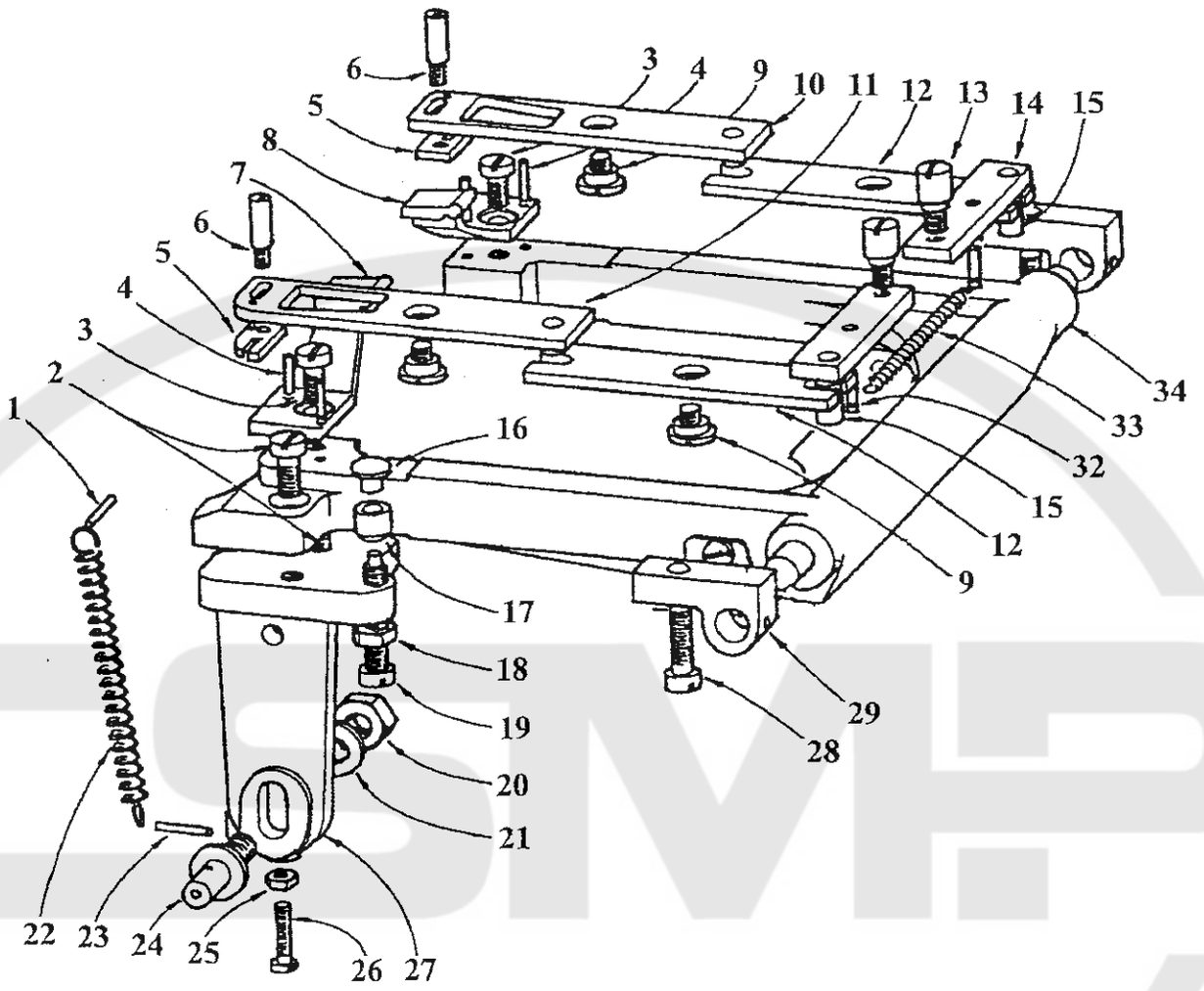
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
02	17.0082.6.000	Clamp	20	17.0082.5.944	Guide
03	08.6010.3.006	Screw	21	17.0027.1.405	Rod
04	17.0084.1.459	Guide	22	17.0013.5.068	Stud
05	17.0045.1.106	Slide Block	23	17.0081.6.201	Length Gauge
06	08.6000.5.010	Screw	24	17.0043.6.353	Plate
07	17.0082.5.996	Bumper	25	17.0004.9.509	Stop
08	08.6310.6.016	Screw	26	08.6000.4.012	Screw
09	17.0012.0.246	Screw	27	17.0064.5.753	Plate
10	17.0031.0.351	Pin	28	17.0082.6.227	Holder
11	17.0064.7.262	Plate	29	17.0064.6.327	Bracket
13	08.6850.5.000	Washer	30	17.0012.0.627	Pin
14	17.0081.8.554	Bumper	31	17.0012.0.234	Screw
15	17.0084.1.570	Guide	32	08.6850.4.000	Washer
17	17.0071.4.170	Bedplate	33	17.0083.9.240	Plate
18	17.0032.3.011	Stud	34	08.6000.5.012	Screw
19	17.0041.8.067	Roll	35	08.6310.5.008	Screw

CLAMP PLATE ASSEMBLY



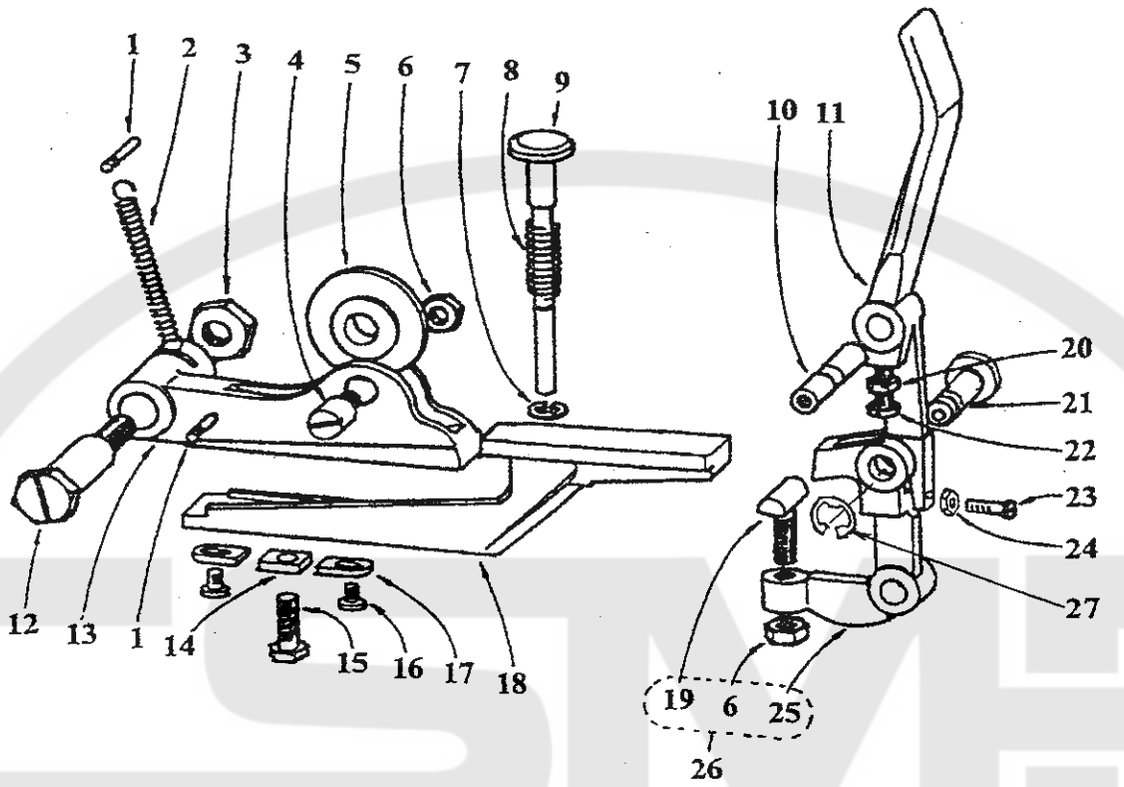
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0081.5.047	Latch	22	18.0081.5.402	L.H. Clamp Plate
02	17.0012.0.572	Screw	23	17.0087.0.169	Knife
03	08.6000.4.025	Screw	24	17.0012.0.303	Screw
04	17.0082.5.893	Stop	25	17.0082.5.884	Clip
05	17.0064.6.130	Block	26	17.0081.1.645	L.H. Clamp Mat
06	17.0012.0.568	Screw	27	18.0081.5.414	R.H. Clamp Plate
07	17.0081.5.048	Slide	28	17.0012.3.054	Screw
08	17.0013.1.414	Stud	29	17.0013.1.047	Screw
09	17.0019.0.228	Washer	30	17.0081.1.646	R.H. Clamp Mat
11	17.0013.5.067	Screw	31	17.0066.7.158	R.H. Clamp Foot
12	17.0063.6.289	L.H. Clamp Arm		17.0066.7.178	R.H. Clamp Foot-Jeans
13	17.0066.7.157	L.H. Clamp Foot		17.0066.7.162	R.H. Clamp Foot-High Rise
	17.0066.7.177	L.H. Clamp Foot-Jeans	32	17.0019.5.040	Lockwasher
	17.0066.7.161	L.H. Clamp Foot-High Rise	33	17.0026.0.217	Spring
14	17.0012.0.573	Screw	34	17.0019.2.066	Curved Spring Washer
15	17.0019.0.551	Washer	35	17.0012.0.328	Screw
16	17.0064.7.225	L.H. Block	36	17.0063.5.245	Spread Lock
17	17.0016.1.328	Nut	38	17.0003.5.810	R.H. Stop
18	17.0041.8.005	Roll	39	17.0012.0.234	Screw
19	17.0063.6.290	R.H. Clamp Arm	40	08.6400.4.005	Screw
20	17.0064.7.224	R.H. Block	41	17.0003.5.809	L.H. Stop
21	17.0034.1.234	Shaft			

CLAMP YOKE ASSEMBLY



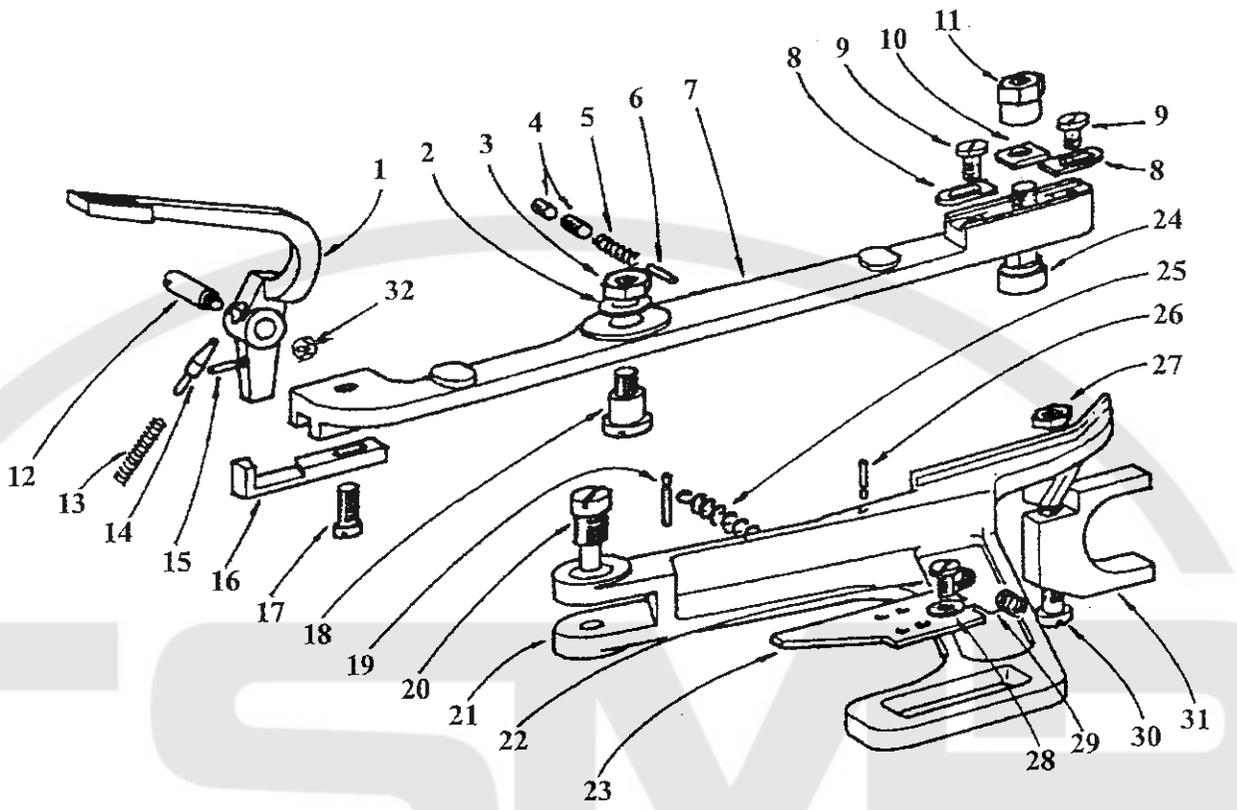
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0031.0.430	Pin	17	17.0041.2.020	Roll
02	17.0012.0.233	Screw	18	08.6700.6.300	Nut
03	17.0012.0.262	Screw	19	17.0013.2.092	Screw
04	17.0031.2.022	Pin	20	17.0016.1.182	Nut
05	17.0081.5.091	Locking Plate	21	17.0019.0.364	Washer
06	17.0013.5.069	Screw	22	17.0026.3.257	Spring
07	17.0063.5.169	L.H. Pulldown	23	17.0031.0.423	Pin
08	17.0063.5.168	R.H. Pulldown	24	17.0033.3.133	Stud
09	17.0013.1.045	Screw	25	17.0016.1.165	Nut
10	17.0002.7.149	R.H. Rear Link	26	17.0012.0.267	Screw
11	17.0002.7.148	L.H. Rear Link	27	17.0076.5.087	Toggle Bracket
12	17.0082.2.054	Front Link	28	08.6000.6.016	Screw
13	17.0013.1.416	Screw	29	17.0074.4.058	Block
14	17.0081.3.064	Slide	32	17.0032.2.030	Pin
15	17.0031.4.031	Roll	33	17.0026.3.019	Spring
16	17.0094.0.029	Stop	34	17.0063.2.160	Clamp Lever

CLAMPING LEVER ASSEMBLY



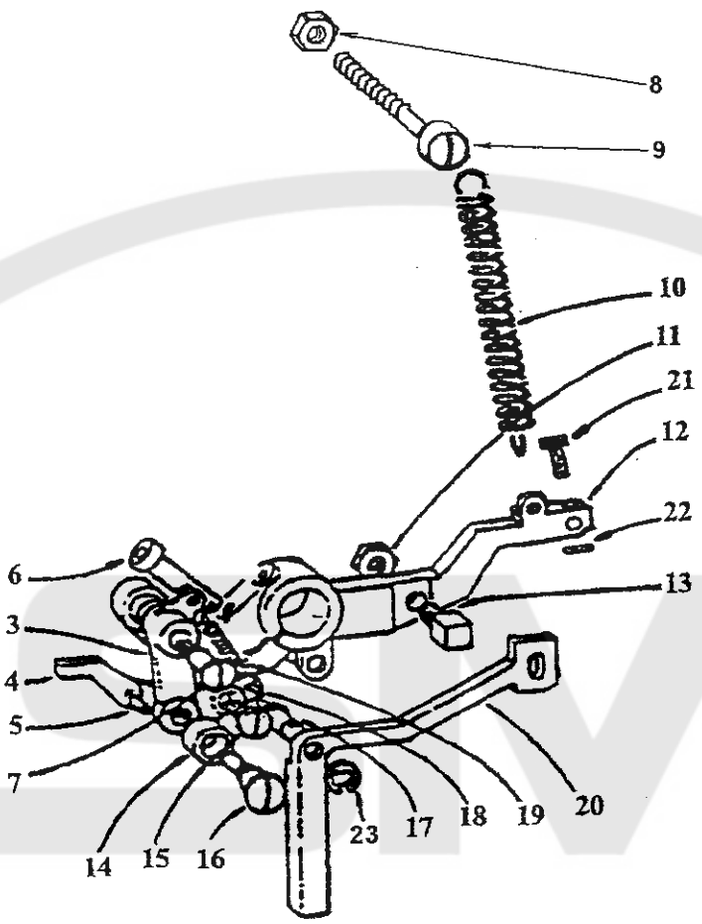
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0031.1.089	Pin	15	08.6310.6.016	Screw
2	17.0026.3.256	Spring	16	17.0012.0.319	Screw
3	17.0016.1.291	Nut	17	17.0081.5.171	Washer
4	17.0033.1.011	Screw	18	17.0063.6.293	Clamp Arm
5	17.0044.1.255	Roll	19	17.0015.4.031	Adjustment Knob
6	08.6700.6.300	Nut	20	17.0016.1.165	Nut
7	17.0027.4.090	E-Ring	21	17.0032.8.133	Stud
8	17.0026.0.216	Spring	22	17.0012.0.267	Screw
9	17.0004.3.260	Stud	23	08.6010.3.012	Screw
10	17.0033.5.052	Shaft	24	17.0016.1.185	Nut
11	17.0061.5.027	Hand Clamp Lever	25	17.0063.6.262	Toggle Lever
12	17.0014.3.011	Pivot Screw	26	17.0004.4.812	Toggle Lever Arm
13	17.0061.2.346	Clamping Lever	27	17.0027.4.084	Lock Washer
14	17.0019.4.065	Washer			

STARTING LEVER AND SWITCH LEVER ASSEMBLY



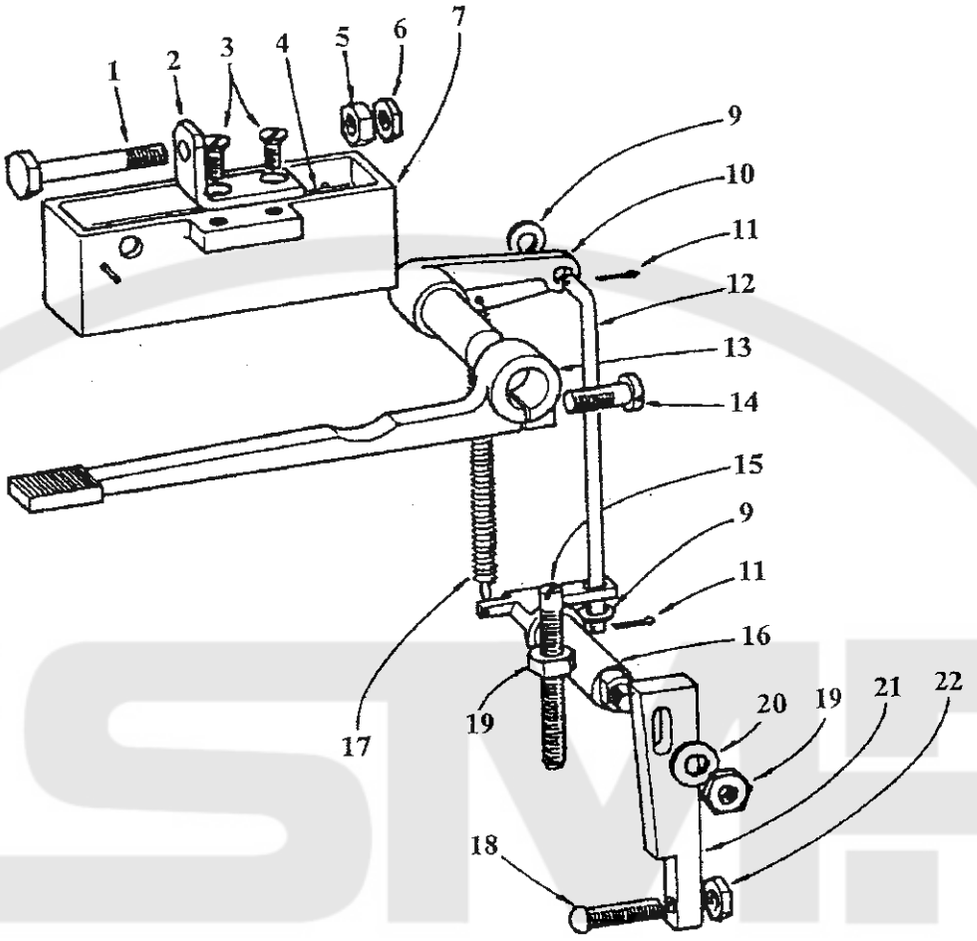
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0063.6.295	Starting Lever	17	08.6000.5.012	Screw
02	17.0019.0.346	Washer	18	17.0033.2.030	Screw
03	17.0016.1.142	Nut	19	17.0031.0.396	Pin
04	17.0011.1.148	Screw	20	17.0033.3.134	Screw
05	17.0026.0.215	Spring	21	17.0063.6.297	Shifter Lever
06	17.0031.7.045	Pin	22	08.6000.4.008	Screw
07	17.0063.6.292	Switch Lever	23	17.0094.5.309	Plate
08	17.0081.5.171	Washer	24	17.0004.3.261	Roll
09	17.0012.0.234	Screw	25	17.0026.3.256	Spring
10	17.0019.4.065	Washer	26	17.0031.1.089	Pin
11	17.0016.1.258	Nut	27	17.0016.1.180	Nut
12	17.0033.1.010	Stud	28	08.6850.4.000	Washer
13	17.0026.0.214	Spring	29	17.0027.1.799	Spring
14	17.0031.3.030	Plunger	30	17.0012.1.148	Screw
15	17.0011.1.364	Screw	31	17.0062.5.144	Shifter Shoe
16	17.0062.5.015	Trip	32	17.0016.1.297	Nut

THREE FORK LEVER ASSEMBLY



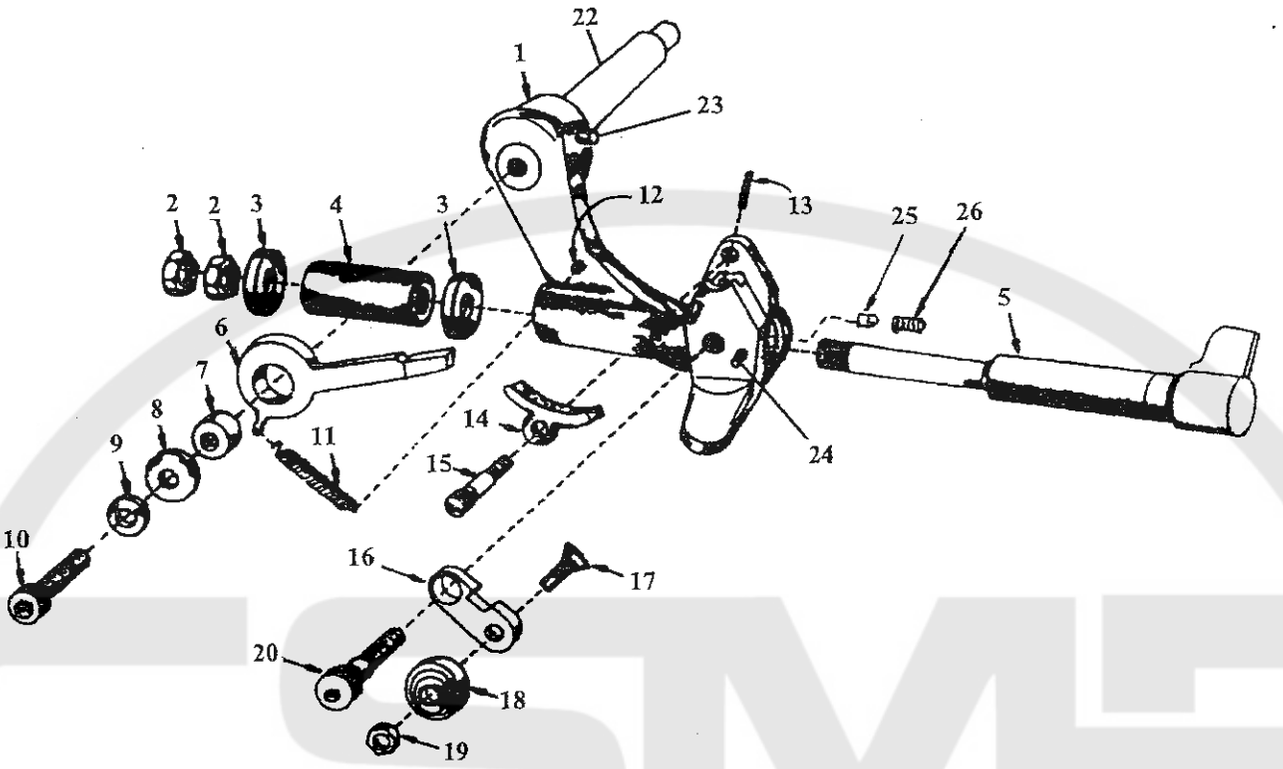
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
03	17.0061.2.290	Link	14	17.0041.8.008	Roll
04	17.0063.6.267	Lever	15	17.0013.1.417	Screw
05	17.0031.4.083	Pin	16	17.0013.1.419	Screw
06	17.0014.1.205	Screw	17	17.0032.0.264	Stud
07	17.0013.1.418	Screw	18	17.0031.1.091	Pin
08	17.0016.1.140	Nut	19	17.0026.3.126	Spring
09	17.0012.0.565	Screw	20	17.0063.5.175	Lever
10	17.0026.3.258	Spring	21	08.6200.4.025	Screw
11	17.0016.1.180	Nut	22	17.0016.1.328	Nut
12	17.0063.5.088	Lever	23	17.0027.4.090	E-Ring
13	17.0014.4.001	Stud			

TRIP LEVER ASSEMBLY



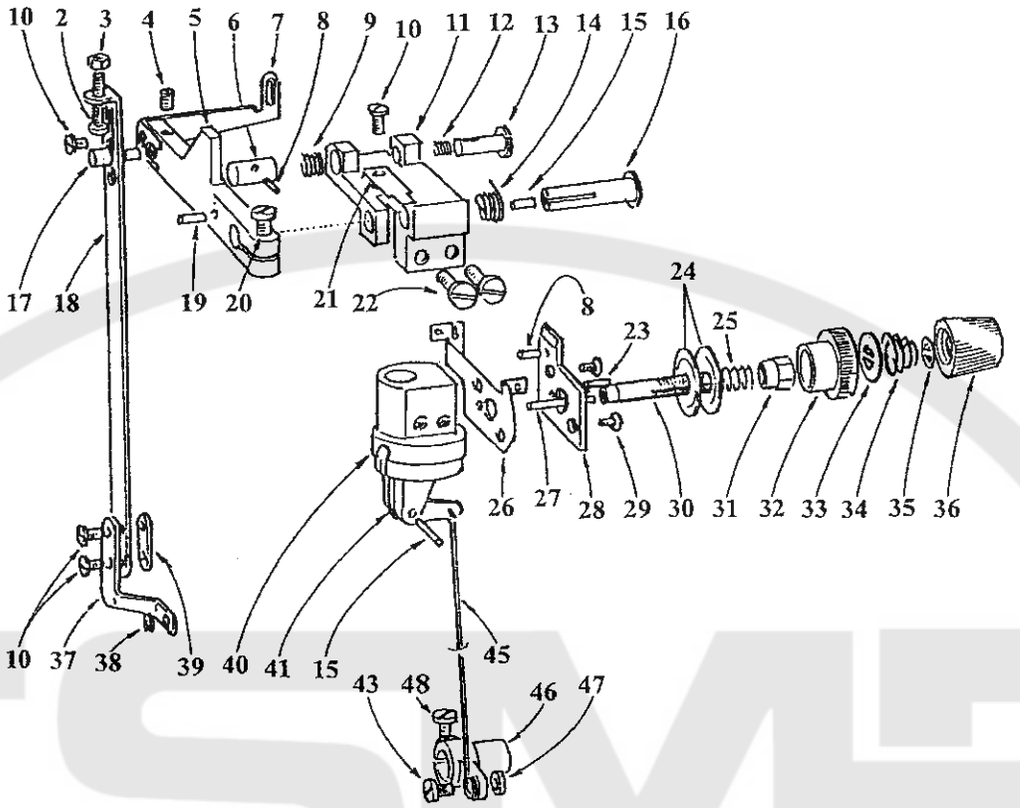
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	08.6310.6.035	Screw	13	17.0061.2.345	Lever
02	17.0082.5.904	Bracket	14	17.0012.0.248	Screw
03	17.0012.6.066	Screw	15	17.0011.3.022	Screw
04	17.0094.5.314	Felt	16	17.0032.6.200	Stud
05	17.0016.1.142	Nut	17	17.0026.3.189	Spring
06	17.0016.1.140	Nut	18	17.0012.4.011	Screw
07	17.0071.0.104	Oil Reservoir	19	17.0016.1.180	Nut
09	08.6850.4.000	Washer	20	17.0019.0.346	Washer
10	17.0061.2.344	Lever	21	17.0064.5.814	Trip Lever
11	17.0027.1.349	Split Pin	22	17.0016.1.179	Nut
12	17.0038.3.177	Link			

ROCKING LEVER



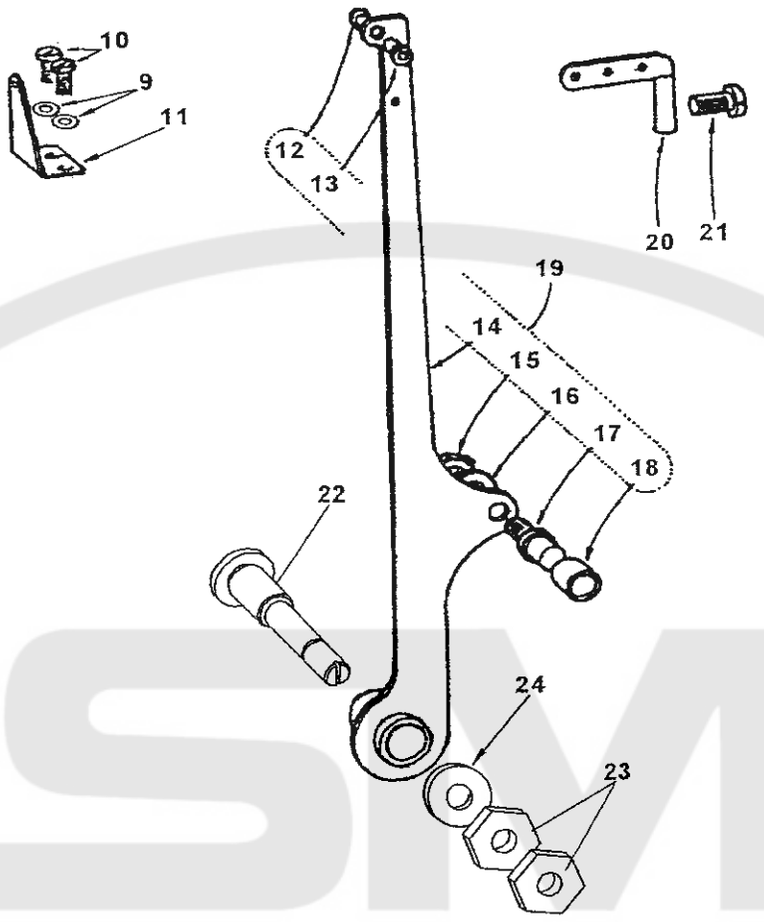
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0063.6.312	Rocking Lever Asm.	14	17.0002.4.121	Brake Shoe
02	17.0016.1.161	Nut	15	17.0013.1.413	Screw
03	17.0019.0.441	Washer	16	17.0061.2.415	Link
04	17.0094.0.172	Elastomer Spring	17	17.0012.6.096	Screw
05	17.0062.5.179	Bolt	18	17.0041.8.400	Roll
06	17.0062.5.178	Latch	19	17.0016.3.400	Nut
07	17.0041.0.665	Bushing	20	17.0013.1.461	Pivot Screw
08	17.0019.0.367	Washer	22	17.0034.8.068	Shaft
09	17.0019.1.108	Lockwash	23	17.0031.2.024	Pin
10	08.6000.6.020	Screw	24	17.0031.0.429	Pin
11	17.0026.3.271	Spring	25	17.0095.1.276	Leather Washer
12	17.0031.0.461	Anchor Pin	26	08.6400.4.006	Screw
13	17.0026.1.084	Spring			

TOP THREAD TRIMMER ASSEMBLY



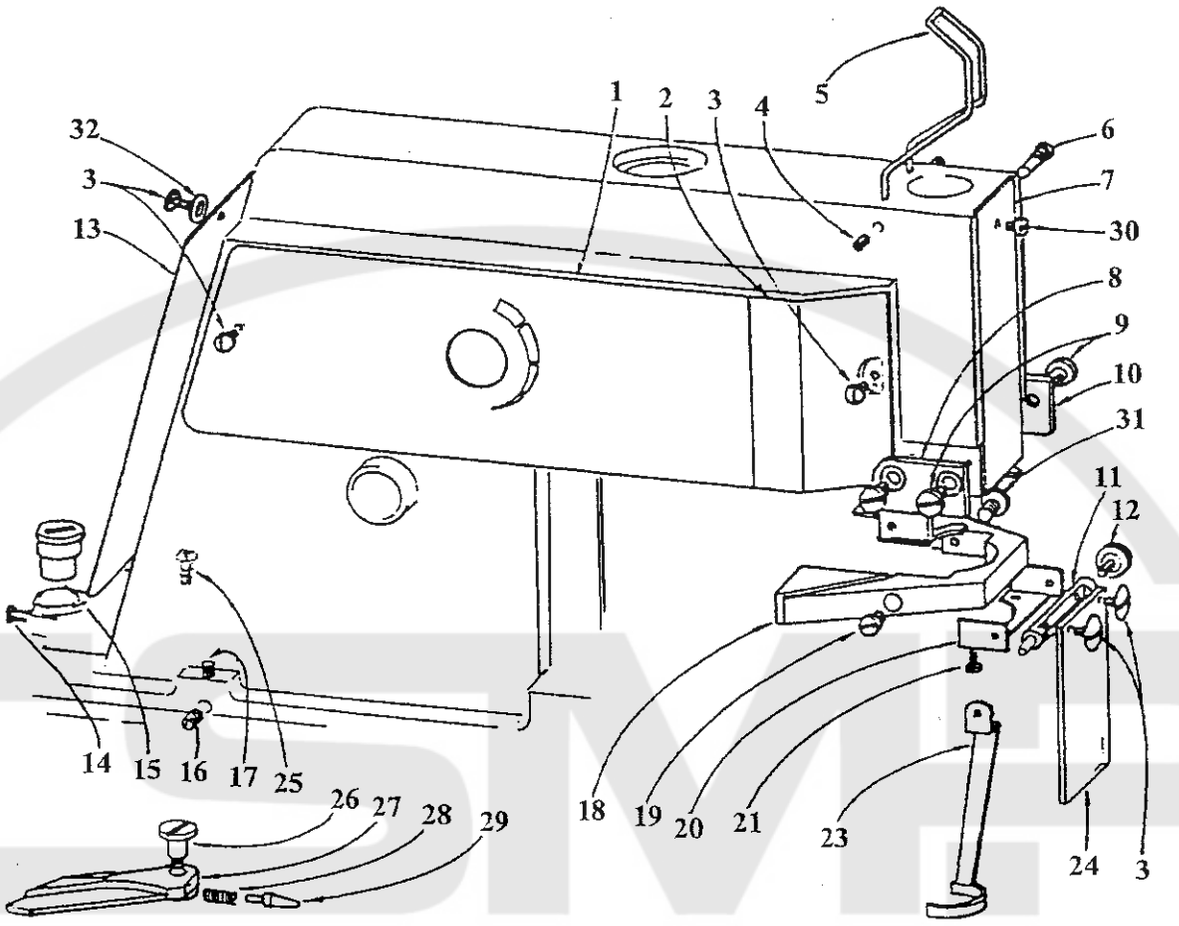
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
02	17.0015.2.110	Screw	25	17.0026.2.078	Spring
03	17.0016.1.185	Nut		17.0026.2.063	Spring-Jeans
04	17.0011.1.229	Screw	26	17.0082.1.167	Bracket
05	17.0063.5.266	Bracket	27	17.0031.0.440	Pin
06	17.0031.8.198	Stud	28	17.0082.6.273	Pin Holder
07	17.0083.9.268	Lever	29	17.0012.6.078	Screw
08	17.0031.0.328	Pin	30	17.0033.5.138	Stud
09	17.0026.0.553	Spring	31	17.0016.1.302	Nut
10	17.0012.4.103	Screw	32	17.0042.6.078	Bushing
11	17.0064.8.106	Holder	33	17.0082.8.060	Washer
12	17.0026.1.084	Spring	34	17.0026.2.072	Spring
13	17.0032.6.230	Stud	35	17.0019.5.019	Washer
14	17.0026.4.257	Spring	36	17.0016.3.069	Nut
15	17.0031.0.425	Pin	37	17.0082.2.481	Bracket
16	17.0032.8.134	Pin	38	17.0027.4.090	E-Ring
17	17.0032.2.204	Pin	39	17.0081.0.485	Lock Plate
18	17.0082.2.380	Lever	40	17.0044.1.240	Holder
19	17.0031.0.352	Pin	41	17.0061.6.028	Release Lever
20	08.6000.4.012	Screw	43	08.6000.4.012	Screw
21	17.0081.5.197	Cover Plate	45	17.0027.1.345	Tension Release Link
22	08.6000.5.010	Screw	46	17.0061.3.351	Lever
23	17.0031.0.438	Pin	47	17.0016.1.165	Nut
24	17.0082.8.071	Tension Disc	48	17.0012.0.221	Screw M5x12

TAKE-UP LEVER AND TOP THREAD TENSION ASSEMBLY



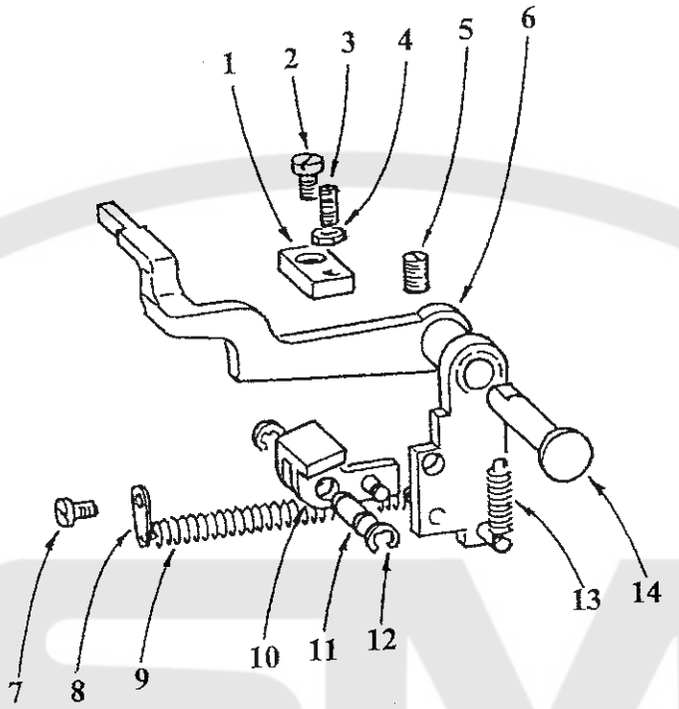
DET	PART NUMBER	DESCRIPTION
9	08.6850.5.000	Washer
10	08.6010.3.006	Screw
11	17.0082.1.136	Bracket
12	17.0044.1.286	Bushing
13	17.0042.1.332	Bushing
14	17.0004.9.849	Take-up Lever
15	17.0016.1.140	Nut
16	17.0019.0.346	Washer
17	17.0033.3.130	Stud
18	17.0041.8.003	Roll
19	17.0002.5.228	Take-up Lever Asm.
20	17.0027.2.053	Thread Guide
21	08.6010.4.012	Screw
22	18.0033.2.404	Stud
23	08.6710.8.400	Nut
24	17.0019.0.251	Washer

HEAD



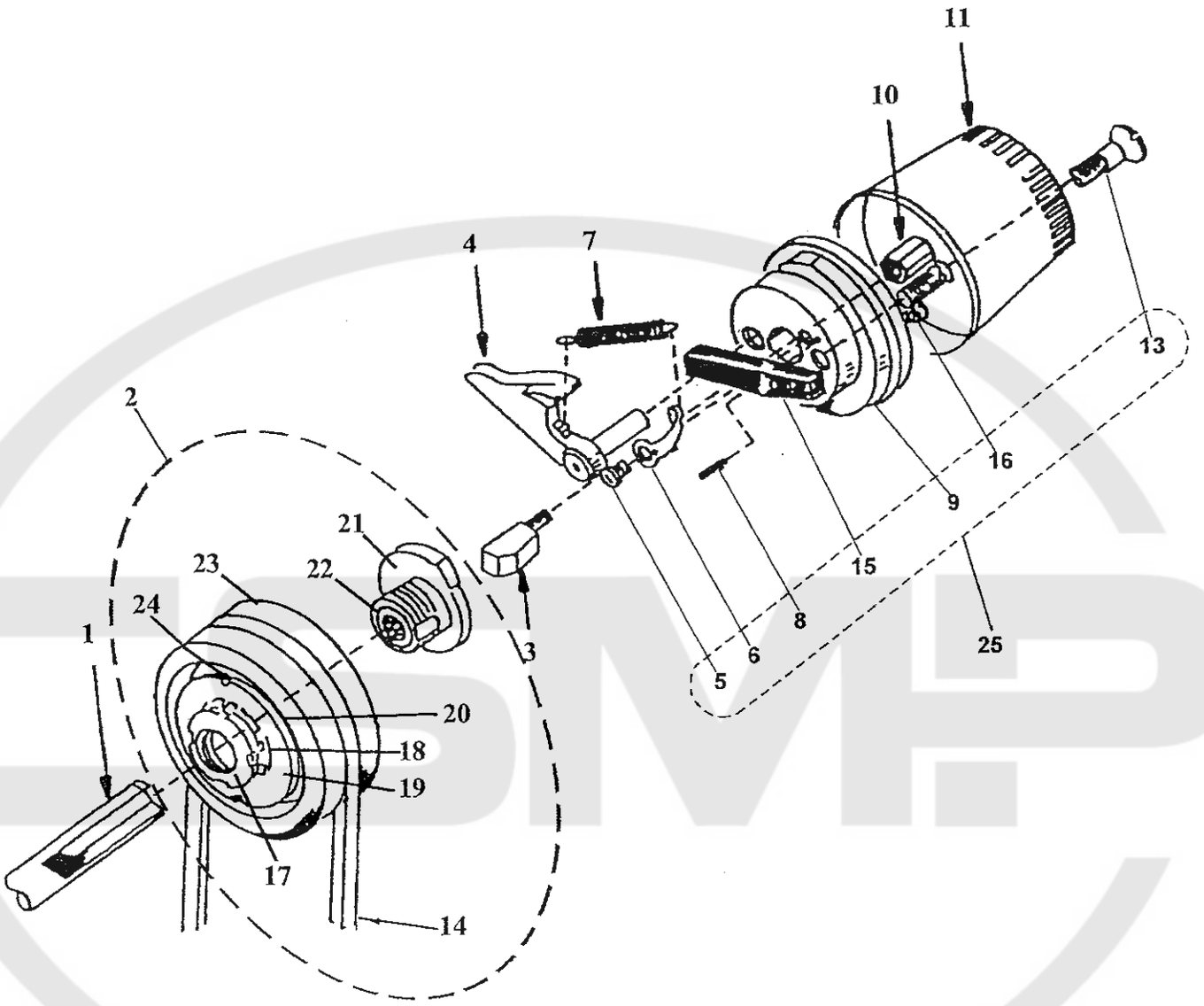
DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
01	17.0004.8.932	Cover	17	17.0094.5.255	Screw
02	17.0004.8.933	Cover	18	17.0074.6.151	Guard
03	17.0012.4.103	Screw	19	08.6000.4.006	Screw
04	17.0011.1.251	Screw	20	17.0082.5.911	Bracket
05	17.0027.1.419	Guard	21	08.6010.3.006	Screw
06	17.0013.1.415	Screw	23	17.0027.1.370	Needle Guard
07	17.0083.1.413	Cover	24	17.0095.3.178	Eye Shield
08	17.0064.7.000	Plate	25	17.0033.2.104	Screw
09	17.0012.0.229	Screw	26	17.0033.1.170	Screw
10	17.0064.7.164	Plate	27	17.0063.5.214	Lever
11	17.0034.9.205	Holder	28	17.0026.0.214	Spring
12	22.0124.0.000	Screw	29	17.0031.3.030	Plunger
13	17.0083.1.414	Plate	30	08.6200.4.006	Screw
14	08.6000.4.012	Screw	31	08.6000.4.008	Screw
15	17.0004.7.157	Bushing	32	08.6850.4.000	Washer
16	17.0011.1.173	Screw			

TOP THREAD TRIMMER ASSEMBLY ACTUATOR



DET	PART NUMBER	DESCRIPTION
01	17.0064.6.284	Block
02	17.0012.0.218	Screw
03	17.0011.1.250	Screw
04	17.0016.1.165	Nut
05	17.0011.2.014	Screw
06	17.0004.4.950	Lever
07	17.0012.0.217	Screw
08	17.0082.6.191	Plate
09	17.0026.3.168	Spring
10	17.0004.4.951	Block
11	17.0032.2.305	Pin
12	17.0027.4.083	Lockwasher
13	17.0026.3.244	Spring
14	17.0032.8.209	Stud

RIGHT HAND STOP WHEEL

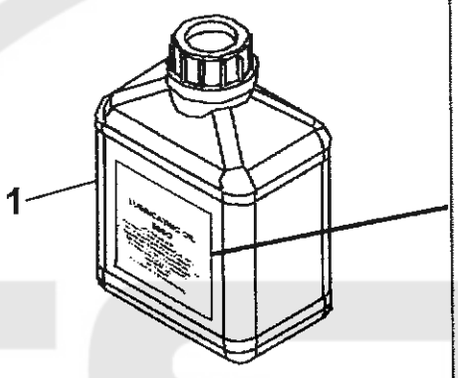


DET	PART NUMBER	DESCRIPTION	DET	PART NUMBER	DESCRIPTION
1	17.0034.9.201	Shaft	15	14.1155.1.000	Stop
2	17.0002.4.277	Stitch Drive Hub Asm.	16	08.6010.4.012	Screw
3	17.0021.0.021	Key	17	17.0017.4.075	Lock Nut
4	14.1089.0.000	Clutch Dog. Asm.	18	17.0019.5.047	Lockwasher
5	08.6010.4.008	Screw	19	17.0019.2.086	Spring Washer
6	10.1090.0.000	Spring Arm	20	17.0019.5.048	Washer
7	01.5450.0.000	Spring Arm Asm.	21	17.0067.2.186	Cam
8	12.1014.0.004	Roll Pin	22	01.7667.0.000	Ball Bearing
9	————	Only Part Of Assembly 17.1088.1.050	23	17.0052.0.426	Pulley
10	17.0016.1.308	Nut	24	17.0031.0.425	Pin
11	17.0051.0.066	Hand Grip	25	17.1088.1.050	R.H.Stop Wheel Ass.
13	08.6100.6.050	Screw			
14	12.5050.1.004	Stitch Wheel Belt - 50 Hz			
	12.5050.1.005	Stitch Wheel Belt - 60 Hz			

ANNEX 1 GLOBAL ACCESSORIES

DET	PART NUMBER	DESCRIPTION
01	17.0009.4.107	Accesory BH 1000, Basic
02	22.0218.0.000	Foot Pedal Assy, Wide
03	04.9000.0.050	Kit Transmitter Assembly
04	17.0067.4.153	Lateral Cam Eye Flybar 16mm
05	17.0067.4.157	Lateral Cam Eye Flybar 22mm
06	17.0067.4.151	Lateral Cam Eye Flybar 13mm
07	17.0064.5.849	Cutting Steel 16
08	17.0064.5.852	Cutting Steel 22
09	17.0064.5.951	Cutting Steel 13
10	17.0064.7.263	Throat Plate
11	18.0087.0.406	Knife CB
12	04.9000.0.123	Frame Kit Assembly
13	12.5050.1.004	Stitch Wheel Belt 50Hz
14	04.9000.0.446	Belt, Timing 187 L05

SPECIAL ACCESSORIES



LUBRICATING OIL ESSO

ESSO TERESTIC 68 Oil
is recommended for all models of
Industrial Sewing Machines and all types
of equipment where a medium viscosity petroleum
lubricant of superior quality is indicated.
Air temperature below or above 40°C.

DET.	PART NUMBER	DESCRIPTION
01	05.0090.1.000	Oil Can - 68

INDEX

PART NUMBER	PAGE	DET
01.5450.0.000		
01.5450.0.000	3-31	07
01.7667.0.000	3-31	22
02.0501.0.011	3-8	19
02.0503.3.113	3-8	19
04.9000.0.050	3-32	03
04.9000.0.123	3-32	12
04.9000.0.446	3-32	14
05.0090.1.000	3-33	1
08.6000.4.006		
08.6000.4.006	3-29	19
08.6000.4.008	3-23	22
08.6000.4.008	3-29	31
08.6000.4.010	3-6	22
08.6000.4.012	3-15	18
08.6000.4.012	3-19	26
08.6000.4.012	3-27	20
08.6000.4.012	3-27	43
08.6000.4.012	3-29	14
08.6000.4.025	3-14	20
08.6000.4.025	3-20	03
08.6000.4.045	3-9	25
08.6000.5.010	3-15	04
08.6000.5.010	3-19	06
08.6000.5.010	3-27	22
08.6000.5.012	3-5	19
08.6000.5.012	3-15	14
08.6000.5.012	3-19	34
08.6000.5.012	3-23	17
08.6000.6.016	3-1	15
08.6000.6.016	3-18	12
08.6000.6.016	3-21	28
08.6000.6.020	3-26	10
08.6000.8.016	3-1	17
08.6010.3.006	3-1	25
08.6010.3.006	3-3	09
08.6010.3.006	3-11	20
08.6010.3.006	3-19	03
08.6010.3.006	3-28	10
08.6010.3.006	3-29	21
08.6010.3.012	3-22	23
08.6010.4.008	3-31	05
08.6010.4.010	3-10	21
08.6010.4.010	3-18	17
08.6010.4.012	3-10	04

PART NUMBER	PAGE	DET
08.6010.4.012	3-12	06
08.6010.4.012	3-28	21
08.6010.4.012	3-31	16
08.6010.5.012	3-4	11
08.6010.5.012	3-17	26
08.6100.4.010	3-15	08
08.6100.6.050	3-31	13
08.6200.4.006	3-3	43
08.6200.4.006	3-29	30
08.6200.4.025	3-24	21
08.6300.8.065	3-3	02
08.6310.4.006	3-6	17
08.6310.5.008	3-19	35
08.6310.6.016	3-3	24
08.6310.6.016	3-19	08
08.6310.6.016	3-22	15
08.6310.6.035	3-25	01
08.6400.4.005	3-20	40
08.6400.4.006	3-26	26
08.6400.5.305	3-8	14
08.6400.5.305	3-16	05
08.6700.6.300	3-6	35
08.6700.6.300	3-13	02
08.6700.6.300	3-21	18
08.6700.6.300	3-22	06
08.6710.3.000	3-11	32
08.6710.8.400	3-28	23
08.6850.4.000	3-3	41
08.6850.4.000	3-3	46
08.6850.4.000	3-4	25
08.6850.4.000	3-6	13
08.6850.4.000	3-9	24
08.6850.4.000	3-11	29
08.6850.4.000	3-18	18
08.6850.4.000	3-19	32
08.6850.4.000	3-23	28
08.6850.4.000	3-25	09
08.6850.4.000	3-29	32
08.6850.5.000	3-9	11
08.6850.5.000	3-10	07
08.6850.5.000	3-19	13
08.6850.5.000	3-28	09
10.1021.2.000		
10.1021.2.000	3-8	15
10.1090.0.000	3-31	06

PART NUMBER	PAGE	DET
12.1014.0.004	3-31	08
12.2010.0.002	3-18	16
12.2010.1.001	3-8	03
12.2050.0.000	3-7	17
12.2050.1.001	3-5	21
12.2050.1.002	3-15	05
12.2099.1.007	3-14	27
12.5050.1.004	3-31	14
12.5050.1.004	3-32	13
12.5050.1.005	3-31	14
12.5050.1.500	3-14	17
14.1089.0.000	3-31	04
14.1155.1.000	3-31	15
17.0002.0.366		
17.0002.0.366	3-1	01
17.0002.1.274	3-8	09
17.0002.4.121	3-26	14
17.0002.4.140	3-4	03
17.0002.4.277	3-31	02
17.0002.5.228	3-28	19
17.0002.5.241	3-4	29
17.0002.6.188	3-6	39
17.0002.7.148	3-21	11
17.0002.7.149	3-21	10
17.0002.7.563	3-8	07
17.0002.7.575	3-15	11
17.0002.7.584	3-17	04
17.0002.7.589	3-15	01
17.0003.5.431	3-6	32
17.0003.5.475	3-7	15
17.0003.5.479	3-7	14
17.0003.5.483	3-6	30
17.0003.5.711	3-11	11
17.0003.5.711	3-11	22
17.0003.5.721	3-11	28
17.0003.5.809	3-20	41
17.0003.5.810	3-20	38
17.0004.1.189	3-3	37
17.0004.3.259	3-18	06
17.0004.3.260	3-22	09
17.0004.3.261	3-23	24
17.0004.3.485	3-4	13
17.0004.4.557	3-18	25
17.0004.4.559	3-16	10
17.0004.4.793	3-10	13

INDEX

PART NUMBER	PAGE	DET
17.0004.4.795	3-10	12
17.0004.4.797	3-7	26
17.0004.4.806	3-13	06
17.0004.4.812	3-22	26
17.0004.4.819	3-6	38
17.0004.4.829	3-11	24
17.0004.4.950	3-30	06
17.0004.4.951	3-30	10
17.0004.6.939	3-9	13
17.0004.7.157	3-29	15
17.0004.7.242	3-7	04
17.0004.8.900	3-3	18
17.0004.8.902	3-3	38
17.0004.8.904	3-3	40
17.0004.8.932	3-29	01
17.0004.8.933	3-29	02
17.0004.9.509	3-19	25
17.0004.9.849	3-28	14
17.0004.9.850	3-10	08
17.0004.9.858	3-6	07
17.0004.9.894	3-11	09
17.0004.9.895	3-11	06
17.0004.9.929	3-15	24
17.0006.0.152	3-16	07
17.0009.4.107	3-32	01
17.0011.1.079		
17.0011.1.079	3-1	10
17.0011.1.148	3-23	04
17.0011.1.173	3-29	16
17.0011.1.229	3-27	04
17.0011.1.230	3-6	26
17.0011.1.230	3-7	22
17.0011.1.234	3-3	08
17.0011.1.234	3-8	33
17.0011.1.240	3-13	11
17.0011.1.240	3-14	26
17.0011.1.242	3-13	20
17.0011.1.248	3-11	12
17.0011.1.249	3-11	33
17.0011.1.250	3-30	03
17.0011.1.251	3-29	04
17.0011.1.261	3-5	01
17.0011.1.302	3-1	27
17.0011.1.364	3-23	15
17.0011.2.013	3-10	27

PART NUMBER	PAGE	DET
17.0011.2.014	3-30	05
17.0011.2.107	3-8	05
17.0011.3.022	3-25	15
17.0011.3.113	3-17	36
17.0011.5.019	3-17	12
17.0011.7.009	3-16	01
17.0011.8.041	3-12	13
17.0012.0.113		
17.0012.0.113	3-9	06
17.0012.0.114	3-5	15
17.0012.0.120	3-8	25
17.0012.0.215	3-6	10
17.0012.0.217	3-3	35
17.0012.0.217	3-4	28
17.0012.0.217	3-6	14
17.0012.0.217	3-30	07
17.0012.0.218	3-13	16
17.0012.0.218	3-30	02
17.0012.0.221	3-27	48
17.0012.0.227	3-4	26
17.0012.0.229	3-29	09
17.0012.0.232	3-14	05
17.0012.0.233	3-21	02
17.0012.0.234	3-19	31
17.0012.0.234	3-20	39
17.0012.0.234	3-23	09
17.0012.0.246	3-17	20
17.0012.0.246	3-19	09
17.0012.0.248	3-25	14
17.0012.0.262	3-21	03
17.0012.0.267	3-21	26
17.0012.0.267	3-22	22
17.0012.0.290	3-7	09
17.0012.0.290	3-12	16
17.0012.0.301	3-9	14
17.0012.0.303	3-20	24
17.0012.0.319	3-22	16
17.0012.0.328	3-17	05
17.0012.0.328	3-20	35
17.0012.0.331	3-17	03
17.0012.0.404	3-11	37
17.0012.0.423	3-8	31
17.0012.0.425	3-17	32
17.0012.0.457	3-13	32
17.0012.0.516	3-13	28

PART NUMBER	PAGE	DET
17.0012.0.543	3-7	20
17.0012.0.543	3-8	29
17.0012.0.549	3-15	16
17.0012.0.565	3-24	09
17.0012.0.568	3-20	06
17.0012.0.570	3-8	20
17.0012.0.571	3-17	18
17.0012.0.572	3-20	02
17.0012.0.573	3-20	14
17.0012.0.576	3-6	33
17.0012.0.605	3-11	26
17.0012.0.627	3-19	30
17.0012.1.137	3-12	14
17.0012.1.139	3-11	21
17.0012.1.140	3-11	19
17.0012.1.142	3-11	16
17.0012.1.148	3-23	30
17.0012.1.169	3-6	36
17.0012.2.031	3-7	08
17.0012.3.054	3-20	28
17.0012.4.011	3-25	18
17.0012.4.042	3-4	01
17.0012.4.098	3-3	34
17.0012.4.103	3-3	11
17.0012.4.103	3-27	10
17.0012.4.103	3-29	03
17.0012.6.066	3-25	03
17.0012.6.078	3-27	29
17.0012.6.096	3-26	17
17.0012.6.110	3-15	25
17.0012.6.149	3-14	25
17.0012.7.007	3-14	31
17.0013.1.045	3-21	09
17.0013.1.047	3-20	29
17.0013.1.341	3-3	21
17.0013.1.343	3-4	20
17.0013.1.413	3-26	15
17.0013.1.414	3-20	08
17.0013.1.415	3-17	16
17.0013.1.415	3-29	06
17.0013.1.416	3-21	13
17.0013.1.417	3-24	15
17.0013.1.418	3-24	07
17.0013.1.419	3-24	16
17.0013.1.420	3-8	16
17.0013.1.461	3-26	20

INDEX

PART NUMBER	PAGE	DET
17.0013.2.090	3-14	14
17.0013.2.090	3-18	19
17.0013.2.092	3-21	19
17.0013.2.119	3-5	04
17.0013.2.119	3-9	21
17.0013.2.120	3-5	14
17.0013.2.120	3-9	02
17.0013.2.192	3-14	01
17.0013.4.027	3-17	01
17.0013.5.067	3-20	11
17.0013.5.068	3-19	22
17.0013.5.069	3-21	06
17.0013.6.032	3-18	21
17.0014.1.015	3-10	02
17.0014.1.015	3-15	20
17.0014.1.033	3-18	11
17.0014.1.066	3-17	29
17.0014.1.112	3-3	23
17.0014.1.180	3-16	22
17.0014.1.205	3-24	06
17.0014.1.243	3-1	04
17.0014.1.244	3-1	05
17.0014.1.285	3-15	23
17.0014.2.011	3-14	32
17.0014.3.011	3-22	12
17.0014.4.001	3-24	13
17.0014.4.036	3-13	01
17.0014.6.057	3-3	36
17.0015.2.110		
17.0015.2.110	3-27	02
17.0015.4.031	3-22	19
17.0016.1.045	3-15	21
17.0016.1.093	3-12	24
17.0016.1.093	3-18	23
17.0016.1.135	3-3	15
17.0016.1.137	3-9	15
17.0016.1.140	3-6	03
17.0016.1.140	3-10	14
17.0016.1.140	3-24	08
17.0016.1.140	3-25	06
17.0016.1.140	3-28	15
17.0016.1.142	3-6	04
17.0016.1.142	3-23	03
17.0016.1.142	3-25	05
17.0016.1.143	3-10	17
17.0016.1.146	3-13	19
17.0016.1.149	3-11	01
17.0016.1.161	3-26	02
17.0016.1.165	3-9	05
17.0016.1.165	3-11	30
17.0016.1.165	3-12	25
17.0016.1.165	3-21	25
17.0016.1.165	3-22	20
17.0016.1.165	3-27	47
17.0016.1.165	3-30	04
17.0016.1.179	3-9	16
17.0016.1.179	3-11	02
17.0016.1.179	3-14	30
17.0016.1.179	3-15	19
17.0016.1.179	3-25	22
17.0016.1.180	3-23	27
17.0016.1.180	3-24	11
17.0016.1.180	3-25	19
17.0016.1.182	3-16	15
17.0016.1.182	3-21	20
17.0016.1.185	3-22	24
17.0016.1.185	3-27	03
17.0016.1.190	3-1	11
17.0016.1.190	3-6	02
17.0016.1.190	3-13	10
17.0016.1.190	3-14	13
17.0016.1.258	3-23	11
17.0016.1.260	3-17	14
17.0016.1.288	3-17	34
17.0016.1.290	3-16	20
17.0016.1.291	3-22	03
17.0016.1.297	3-23	32
17.0016.1.302	3-27	31
17.0016.1.308	3-31	10
17.0016.1.328	3-20	17
17.0016.1.328	3-24	22
17.0016.2.003	3-15	10
17.0016.3.051	3-13	30
17.0016.3.069	3-27	36
17.0016.3.400	3-26	19
17.0017.1.016	3-12	11
17.0017.4.058	3-7	01
17.0017.4.075	3-31	17
17.0019.0.221	3-9	28
17.0019.0.222	3-9	18
17.0019.0.222	3-18	29
17.0019.0.225	3-7	03
17.0019.0.226	3-9	04
17.0019.0.228	3-11	17
17.0019.0.228	3-20	09
17.0019.0.251	3-28	24
17.0019.0.346	3-3	32
17.0019.0.346	3-10	15
17.0019.0.346	3-13	31
17.0019.0.346	3-17	31
17.0019.0.346	3-23	02
17.0019.0.346	3-25	20
17.0019.0.346	3-28	16
17.0019.0.364	3-6	01
17.0019.0.364	3-16	16
17.0019.0.364	3-21	21
17.0019.0.367	3-26	08
17.0019.0.371	3-7	02
17.0019.0.371	3-16	19
17.0019.0.398	3-10	10
17.0019.0.441	3-3	01
17.0019.0.441	3-26	03
17.0019.0.469	3-14	11
17.0019.0.517	3-6	19
17.0019.0.551	3-20	15
17.0019.0.560	3-17	35
17.0019.0.602	3-4	30
17.0019.0.605	3-5	09
17.0019.0.610	3-14	03
17.0019.1.062	3-8	23
17.0019.1.063	3-14	08
17.0019.1.088	3-11	14
17.0019.1.108	3-26	09
17.0019.1.109	3-3	14
17.0019.2.021	3-1	09
17.0019.2.061	3-6	05
17.0019.2.061	3-18	22
17.0019.2.066	3-20	34
17.0019.2.077	3-7	18
17.0019.2.086	3-31	19
17.0019.4.065	3-22	14
17.0019.4.065	3-23	10
17.0019.5.019	3-27	35
17.0019.5.040	3-20	32
17.0019.5.047	3-31	18
17.0019.5.048	3-31	20
17.0019.5.049	3-14	23

INDEX

PART NUMBER	PAGE	DET
17.0019.6.033	3-14	24
17.0021.0.018		
17.0021.0.018	3-14	07
17.0021.0.021	3-31	03
17.0021.1.045	3-5	18
17.0021.1.068	3-4	07
17.0021.1.069	3-9	07
17.0021.1.070	3-5	06
17.0021.1.071	3-14	12
17.0021.1.073	3-17	27
17.0026.0.214	3-23	13
17.0026.0.214	3-29	28
17.0026.0.215	3-12	18
17.0026.0.215	3-23	05
17.0026.0.216	3-22	08
17.0026.0.217	3-20	33
17.0026.0.481	3-4	06
17.0026.0.553	3-27	09
17.0026.1.082	3-17	15
17.0026.1.084	3-8	32
17.0026.1.084	3-26	13
17.0026.1.084	3-27	12
17.0026.2.063	3-27	25
17.0026.2.072	3-27	34
17.0026.2.077	3-8	17
17.0026.2.078	3-12	12
17.0026.2.078	3-27	25
17.0026.3.013	3-13	14
17.0026.3.013	3-17	06
17.0026.3.014	3-3	47
17.0026.3.014	3-8	28
17.0026.3.019	3-21	33
17.0026.3.123	3-6	27
17.0026.3.126	3-24	19
17.0026.3.168	3-30	09
17.0026.3.173	3-11	35
17.0026.3.189	3-3	20
17.0026.3.189	3-25	17
17.0026.3.231	3-3	27
17.0026.3.244	3-30	13
17.0026.3.245	3-13	27
17.0026.3.256	3-22	02
17.0026.3.256	3-23	25
17.0026.3.257	3-21	22
17.0026.3.258	3-24	10

PART NUMBER	PAGE	DET
17.0026.3.271	3-26	11
17.0026.4.035	3-12	02
17.0026.4.257	3-27	14
17.0026.4.292	3-11	13
17.0026.4.293	3-11	25
17.0027.1.073	3-8	30
17.0027.1.345	3-27	45
17.0027.1.349	3-25	11
17.0027.1.370	3-29	23
17.0027.1.405	3-19	21
17.0027.1.410	3-13	04
17.0027.1.411	3-6	16
17.0027.1.412	3-6	18
17.0027.1.413	3-6	41
17.0027.1.416	3-1	24
17.0027.1.419	3-29	05
17.0027.1.463	3-4	27
17.0027.1.503	3-13	29
17.0027.1.799	3-6	11
17.0027.1.799	3-23	29
17.0027.2.053	3-28	20
17.0027.4.045	3-10	23
17.0027.4.083	3-13	24
17.0027.4.083	3-30	12
17.0027.4.084	3-13	17
17.0027.4.084	3-22	27
17.0027.4.085	3-8	02
17.0027.4.090	3-11	34
17.0027.4.090	3-22	07
17.0027.4.090	3-24	23
17.0027.4.090	3-27	38
17.0027.4.127	3-17	25
17.0027.4.129	3-18	14
17.0027.4.148	3-15	22
17.0028.1.125	3-17	08
17.0028.3.102	3-14	28
17.0028.3.117	3-3	10
17.0031.0.034		
17.0031.0.034	3-3	22
17.0031.0.196	3-8	27
17.0031.0.199	3-6	28
17.0031.0.328	3-14	29
17.0031.0.328	3-27	08
17.0031.0.351	3-19	10
17.0031.0.352	3-27	19

PART NUMBER	PAGE	DET
17.0031.0.396	3-23	19
17.0031.0.405	3-17	09
17.0031.0.406	3-12	22
17.0031.0.423	3-21	23
17.0031.0.425	3-6	43
17.0031.0.425	3-18	03
17.0031.0.425	3-27	15
17.0031.0.425	3-31	24
17.0031.0.426	3-12	04
17.0031.0.427	3-17	07
17.0031.0.428	3-6	21
17.0031.0.428	3-12	03
17.0031.0.429	3-18	08
17.0031.0.429	3-26	24
17.0031.0.430	3-21	01
17.0031.0.431	3-15	07
17.0031.0.433	3-1	18
17.0031.0.434	3-14	09
17.0031.0.438	3-27	23
17.0031.0.440	3-27	27
17.0031.0.461	3-26	12
17.0031.0.480	3-4	04
17.0031.1.089	3-22	01
17.0031.1.089	3-23	26
17.0031.1.091	3-24	18
17.0031.2.013	3-1	03
17.0031.2.022	3-21	04
17.0031.2.024	3-18	04
17.0031.2.024	3-26	23
17.0031.2.029	3-16	09
17.0031.3.027	3-8	13
17.0031.3.030	3-23	14
17.0031.3.030	3-29	29
17.0031.3.330	3-3	07
17.0031.4.031	3-21	15
17.0031.4.083	3-24	05
17.0031.4.205	3-7	24
17.0031.5.041	3-8	21
17.0031.6.063	3-12	26
17.0031.7.039	3-1	14
17.0031.7.045	3-23	06
17.0031.8.198	3-27	06
17.0032.0.193	3-4	10
17.0032.0.194	3-6	25
17.0032.0.261	3-13	25
17.0032.0.264	3-24	17

INDEX

PART NUMBER	PAGE	DET
17.0032.1.074	3-18	27
17.0032.2.030	3-3	28
17.0032.2.030	3-21	32
17.0032.2.204	3-27	17
17.0032.2.268	3-10	01
17.0032.2.272	3-9	27
17.0032.2.282	3-9	17
17.0032.2.305	3-30	11
17.0032.3.011	3-19	18
17.0032.3.162	3-13	22
17.0032.3.196	3-16	13
17.0032.5.031	3-13	07
17.0032.6.200	3-25	16
17.0032.6.230	3-27	13
17.0032.8.133	3-22	21
17.0032.8.134	3-27	16
17.0032.8.209	3-30	14
17.0033.0.102	3-7	06
17.0033.1.010	3-23	12
17.0033.1.011	3-22	04
17.0033.1.153	3-16	18
17.0033.1.170	3-29	26
17.0033.2.030	3-23	18
17.0033.2.104	3-29	25
17.0033.2.126	3-10	26
17.0033.2.133	3-4	12
17.0033.2.143	3-17	38
17.0033.3.129	3-10	16
17.0033.3.130	3-28	17
17.0033.3.131	3-10	20
17.0033.3.132	3-16	06
17.0033.3.133	3-21	24
17.0033.3.134	3-23	20
17.0033.3.138	3-9	10
17.0033.3.158	3-11	23
17.0033.5.052	3-22	10
17.0033.5.113	3-14	16
17.0033.5.127	3-7	23
17.0033.5.137	3-16	21
17.0033.5.138	3-27	30
17.0033.8.088	3-11	08
17.0033.8.089	3-11	05
17.0034.1.234	3-20	21
17.0034.2.145	3-18	13
17.0034.2.219	3-18	02
17.0034.2.328	3-16	08
17.0034.6.039	3-9	26
17.0034.8.068	3-26	22
17.0034.9.155	3-13	12
17.0034.9.156	3-14	10
17.0034.9.201	3-5	08
17.0034.9.201	3-31	01
17.0034.9.205	3-29	11
17.0038.2.012	3-15	15
17.0038.3.177	3-25	12
17.0041.0.232	3-5	16
17.0041.0.548	3-7	25
17.0041.0.550	3-10	06
17.0041.0.551	3-7	07
17.0041.0.554	3-13	09
17.0041.0.665	3-26	07
17.0041.1.094	3-11	15
17.0041.2.020	3-21	17
17.0041.2.149	3-4	21
17.0041.2.160	3-7	11
17.0041.5.030	3-5	02
17.0041.6.129	3-8	22
17.0041.8.003	3-28	18
17.0041.8.005	3-20	18
17.0041.8.008	3-24	14
17.0041.8.067	3-19	19
17.0041.8.096	3-10	19
17.0041.8.181	3-16	12
17.0041.8.400	3-26	18
17.0042.1.279	3-3	31
17.0042.1.282	3-6	12
17.0042.1.283	3-8	06
17.0042.1.332	3-28	13
17.0042.2.149	3-8	04
17.0042.2.216	3-8	24
17.0042.4.120	3-4	08
17.0042.5.041	3-18	10
17.0042.5.247	3-9	20
17.0042.5.249	3-9	29
17.0042.5.256	3-4	05
17.0042.5.280	3-5	20
17.0042.5.287	3-9	03
17.0042.5.288	3-9	09
17.0042.6.053	3-10	24
17.0042.6.054	3-14	19
17.0042.6.078	3-27	32
17.0043.1.011	3-5	07
17.0043.6.018	3-16	04
17.0043.6.277	3-8	08
17.0043.6.280	3-5	11
17.0043.6.351	3-7	21
17.0043.6.351	3-8	10
17.0043.6.352	3-10	11
17.0043.6.353	3-19	24
17.0043.6.437	3-13	26
17.0044.1.211		
17.0044.1.211	3-3	48
17.0044.1.240	3-27	40
17.0044.1.255	3-22	05
17.0044.1.286	3-28	12
17.0044.1.325	3-14	21
17.0044.1.443	3-1	08
17.0044.1.582	3-15	26
17.0044.1.618	3-14	36
17.0044.2.224	3-18	15
17.0044.2.225	3-18	24
17.0044.2.229	3-8	01
17.0044.2.534	3-6	23
17.0044.5.114	3-14	04
17.0045.1.099	3-6	20
17.0045.1.106	3-18	26
17.0045.1.106	3-19	05
17.0045.3.004	3-8	26
17.0045.3.006	3-8	11
17.0045.9.048	3-14	37
17.0045.9.059	3-14	22
17.0051.0.066	3-31	11
17.0052.0.315	3-14	18
17.0052.0.426	3-31	23
17.0055.1.152	3-14	15
17.0055.1.153	3-4	09
17.0055.1.158	3-12	23
17.0055.2.172	3-5	17
17.0055.3.025	3-16	02
17.0055.5.042	3-8	12
17.0057.0.056	3-14	34
17.0057.0.057	3-14	35
17.0057.1.045	3-18	09
17.0061.2.290	3-24	03
17.0061.2.336	3-10	25
17.0061.2.343	3-13	23
17.0061.2.344	3-25	10

INDEX

PART NUMBER	PAGE	DET
17.0061.2.345	3-25	13
17.0061.2.346	3-22	13
17.0061.2.415	3-26	16
17.0061.3.351	3-27	46
17.0061.5.027	3-22	11
17.0061.6.028	3-27	41
17.0062.5.015	3-23	16
17.0062.5.019	3-15	02
17.0062.5.144	3-23	31
17.0062.5.149	3-17	37
17.0062.5.178	3-26	06
17.0062.5.179	3-26	05
17.0063.0.253	3-7	16
17.0063.1.073	3-11	18
17.0063.2.154	3-13	08
17.0063.2.160	3-21	34
17.0063.3.195	3-13	13
17.0063.4.166	3-7	12
17.0063.4.169	3-6	24
17.0063.4.172	3-6	31
17.0063.5.088	3-24	12
17.0063.5.168	3-21	08
17.0063.5.169	3-21	07
17.0063.5.175	3-24	20
17.0063.5.184	3-4	02
17.0063.5.214	3-29	27
17.0063.5.234	3-17	11
17.0063.5.245	3-20	36
17.0063.5.266	3-27	05
17.0063.6.044	3-16	11
17.0063.6.070	3-6	37
17.0063.6.220	3-17	02
17.0063.6.256	3-10	18
17.0063.6.257	3-7	10
17.0063.6.260	3-13	05
17.0063.6.262	3-22	25
17.0063.6.265	3-16	14
17.0063.6.267	3-24	04
17.0063.6.289	3-20	12
17.0063.6.290	3-20	19
17.0063.6.292	3-23	07
17.0063.6.293	3-22	18
17.0063.6.295	3-23	01
17.0063.6.297	3-23	21
17.0063.6.308	3-16	17
17.0063.6.312	3-26	01

PART NUMBER	PAGE	DET
17.0064.1.089	3-13	18
17.0064.1.090	3-6	06
17.0064.5.170	3-17	30
17.0064.5.753	3-19	27
17.0064.5.814	3-25	21
17.0064.5.849	3-32	07
17.0064.5.852	3-32	08
17.0064.5.947	3-15	17
17.0064.5.951	3-32	09
17.0064.6.117	3-10	03
17.0064.6.122	3-13	21
17.0064.6.130	3-20	05
17.0064.6.284	3-30	01
17.0064.6.298	3-17	13
17.0064.6.327	3-19	29
17.0064.6.336	3-11	31
17.0064.6.416	3-17	23
17.0064.7.000	3-29	08
17.0064.7.162	3-12	05
17.0064.7.164	3-29	10
17.0064.7.224	3-20	20
17.0064.7.225	3-20	16
17.0064.7.226	3-18	05
17.0064.7.262	3-19	11
17.0064.7.263	3-12	15
17.0064.7.263	3-32	10
17.0064.8.106	3-27	11
17.0064.8.112	3-3	44
17.0066.7.157	3-20	13
17.0066.7.158	3-20	31
17.0066.7.161	3-20	13
17.0066.7.162	3-20	31
17.0066.7.177	3-20	13
17.0066.7.178	3-20	31
17.0067.1.025	3-6	34
17.0067.2.098	3-5	12
17.0067.2.164	3-15	06
17.0067.2.186	3-31	21
17.0067.2.411	3-5	10
17.0067.4.102	3-18	01
17.0067.4.127	3-15	03
17.0067.4.151	3-32	06
17.0067.4.153	3-32	04
17.0067.4.157	3-32	05
17.0067.5.152	3-9	08
17.0069.4.048	3-11	10

PART NUMBER	PAGE	DET
17.0069.4.049	3-11	07
17.0071.0.104	3-25	07
17.0071.4.170	3-19	17
17.0073.1.018	3-12	21
17.0074.4.058	3-21	29
17.0074.4.405	3-10	05
17.0074.4.407	3-1	21
17.0074.4.421	3-18	07
17.0074.4.451	3-14	33
17.0074.4.464	3-1	23
17.0074.4.504	3-17	21
17.0074.6.150	3-3	13
17.0074.6.151	3-29	18
17.0075.4.012	3-3	30
17.0076.5.087	3-21	27
17.0081.0.421		
17.0081.0.421	3-3	25
17.0081.0.485	3-27	39
17.0081.1.645	3-20	26
17.0081.1.646	3-20	30
17.0081.3.064	3-21	14
17.0081.3.957	3-15	12
17.0081.3.960	3-15	13
17.0081.4.313	3-6	09
17.0081.4.375	3-7	19
17.0081.4.376	3-5	03
17.0081.5.002	3-18	30
17.0081.5.003	3-12	17
17.0081.5.047	3-20	01
17.0081.5.048	3-20	07
17.0081.5.091	3-21	05
17.0081.5.171	3-22	17
17.0081.5.171	3-23	08
17.0081.5.197	3-27	21
17.0081.6.201	3-19	23
17.0081.8.377	3-5	13
17.0081.8.554	3-19	14
17.0082.1.027	3-11	03
17.0082.1.136	3-28	11
17.0082.1.167	3-27	26
17.0082.2.054	3-21	12
17.0082.2.380	3-27	18
17.0082.2.481	3-27	37
17.0082.4.545	3-17	22
17.0082.5.108	3-17	10

INDEX

PART NUMBER	PAGE	DET
17.0082.5.563	3-15	09
17.0082.5.869	3-13	15
17.0082.5.884	3-20	25
17.0082.5.893	3-20	04
17.0082.5.898	3-11	36
17.0082.5.904	3-25	02
17.0082.5.911	3-29	20
17.0082.5.944	3-19	20
17.0082.5.996	3-19	07
17.0082.5.997	3-17	33
17.0082.6.000	3-1	22
17.0082.6.000	3-19	02
17.0082.6.191	3-30	08
17.0082.6.227	3-19	28
17.0082.6.273	3-27	28
17.0082.8.017	3-8	18
17.0082.8.060	3-27	33
17.0082.8.071	3-27	24
17.0082.8.084	3-12	10
17.0083.1.096	3-16	03
17.0083.1.413	3-29	07
17.0083.1.414	3-29	13
17.0083.1.429	3-3	19
17.0083.1.438	3-3	12
17.0083.1.630	3-3	42
17.0083.1.650	3-3	16
17.0083.1.651	3-3	45
17.0083.3.186	3-3	39
17.0083.6.370	3-3	26
17.0083.9.240	3-19	33
17.0083.9.268	3-27	07
17.0084.0.266	3-1	19
17.0084.1.001	3-12	01
17.0084.1.226	3-10	22
17.0084.1.228	3-17	28
17.0084.1.459	3-19	04
17.0084.1.570	3-19	15
17.0087.0.169	3-20	23
17.0087.0.204	3-11	27
17.0094.0.029	3-1	20
17.0094.0.029	3-3	06
17.0094.0.029	3-21	16
17.0094.0.154	3-3	29
17.0094.0.172	3-26	04
17.0094.1.097	3-3	33
17.0094.1.143	3-14	02

PART NUMBER	PAGE	DET
17.0094.2.092	3-6	15
17.0094.3.085	3-17	24
17.0094.3.141	3-14	38
17.0094.3.142	3-14	06
17.0094.5.052	3-1	06
17.0094.5.255	3-29	17
17.0094.5.307	3-13	03
17.0094.5.308	3-9	23
17.0094.5.309	3-23	23
17.0094.5.310	3-18	20
17.0094.5.311	3-18	28
17.0094.5.314	3-25	04
17.0094.5.318	3-6	40
17.0095.1.272	3-3	03
17.0095.1.273	3-3	04
17.0095.1.276	3-26	25
17.0095.1.309	3-3	05
17.0095.1.329	3-6	29
17.0095.3.178	3-29	24
17.0097.5.366	3-6	42
17.1088.1.050	3-31	25
18.0031.3.401		
18.0031.3.401	3-6	08
18.0033.2.404	3-28	22
18.0056.2.117	3-5	05
18.0056.2.117	3-9	22
18.0056.2.118	3-9	01
18.0081.5.402	3-20	22
18.0081.5.414	3-20	27
18.0081.8.706	3-11	04
18.0087.0.405	3-17	17
18.0087.0.406	3-32	11
22.0124.0.000	3-1	26
22.0124.0.000	3-29	12
22.0218.0.000	3-32	02
See Page 3-33	3-17	19

PART NUMBER	PAGE	DET