



DUO
Plus
DUO **DUO**
Sofer *SA*

Operating manual

D435566XA
vers. 4.0

EN



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GUIDE TO THE MANUAL

This manual has been produced to serve as a guide for users of the key-cutting machine DUO PLUS, DUO SOFER and DUO SA. Read it carefully; it is essential if you wish to operate your machine safely and efficiently.

Consultation

The contents of the manual are divided into sections relating to:

- Transport and handling Ch. 1
- Description of machine and safety devices Ch. 2-3-4-5
- Proper use of machine Ch. 6-7
- Maintenance Ch. 8

Technical terms

Common technical terms are used in this manual. To assist those with little experience of key cutting, below is an illustration of the terms used for the different parts of keys:

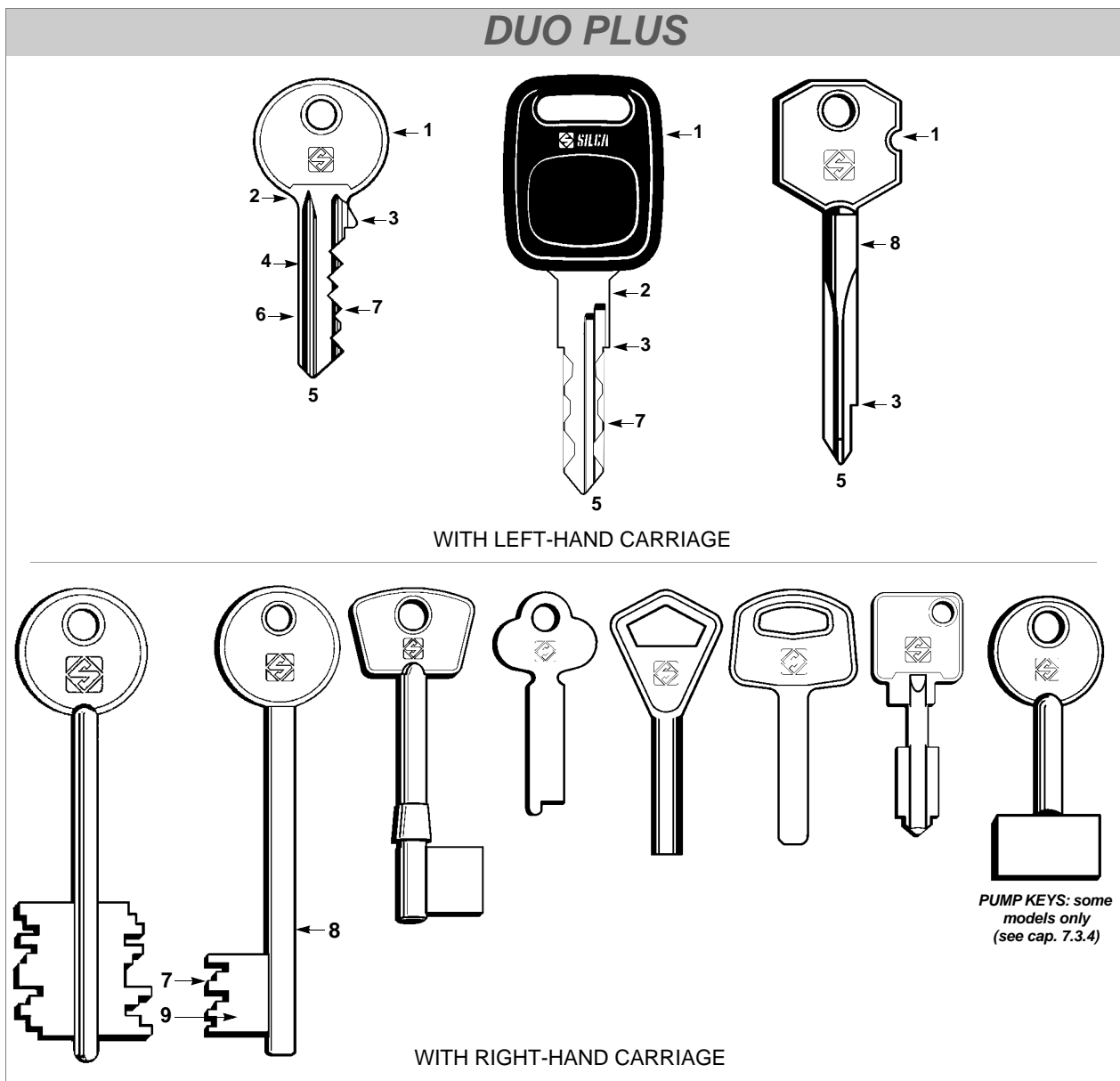


Fig. 1

1	Head	6	Back
2	Rim	7	Cuts
3	Stop	8	Stem
4	Blade	9	Bit
5	Tip		

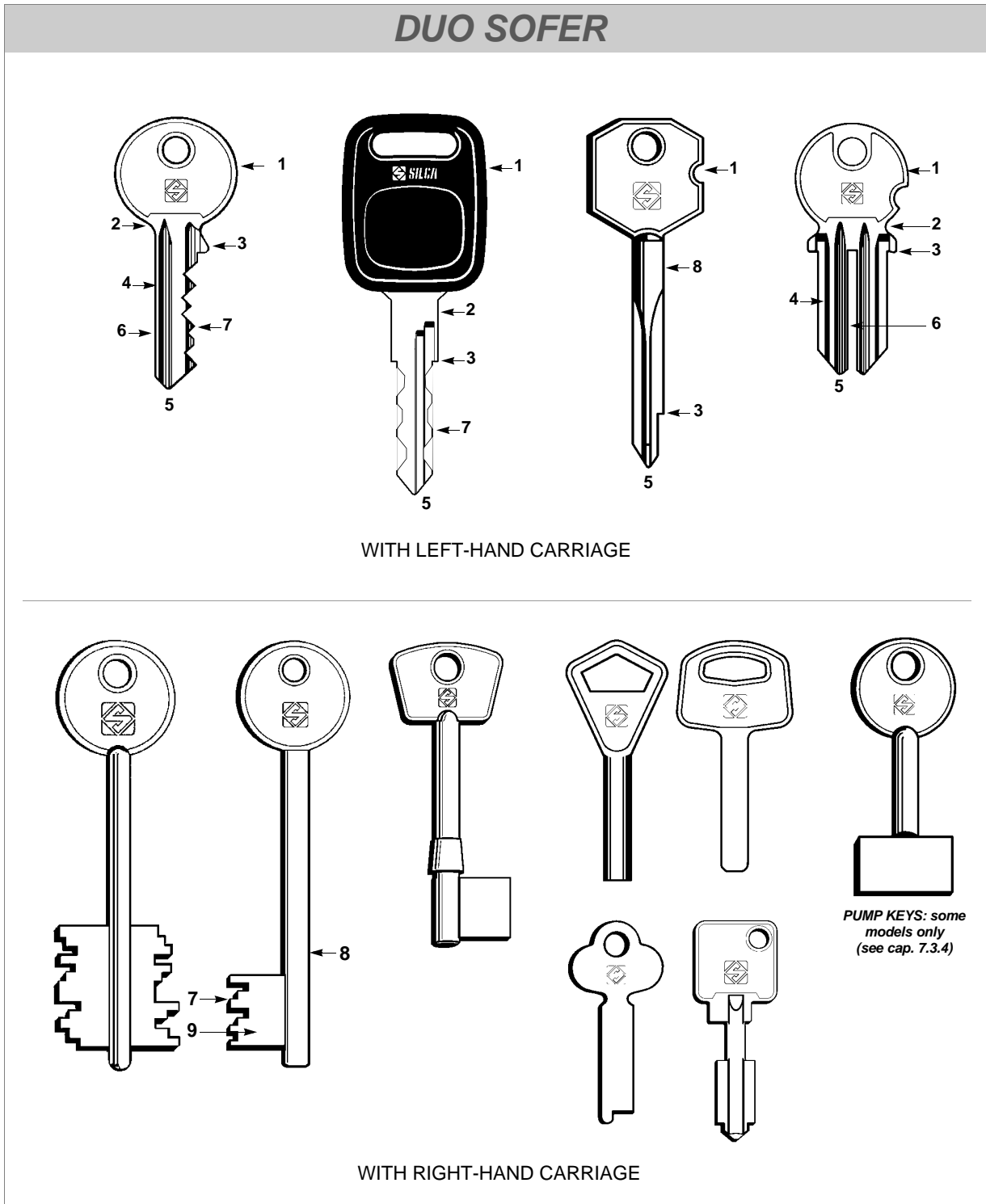


Fig. 2

1	Head	6	Back
2	Rim	7	Cuts
3	Stop	8	Stem
4	Blade	9	Bit
5	Tip		

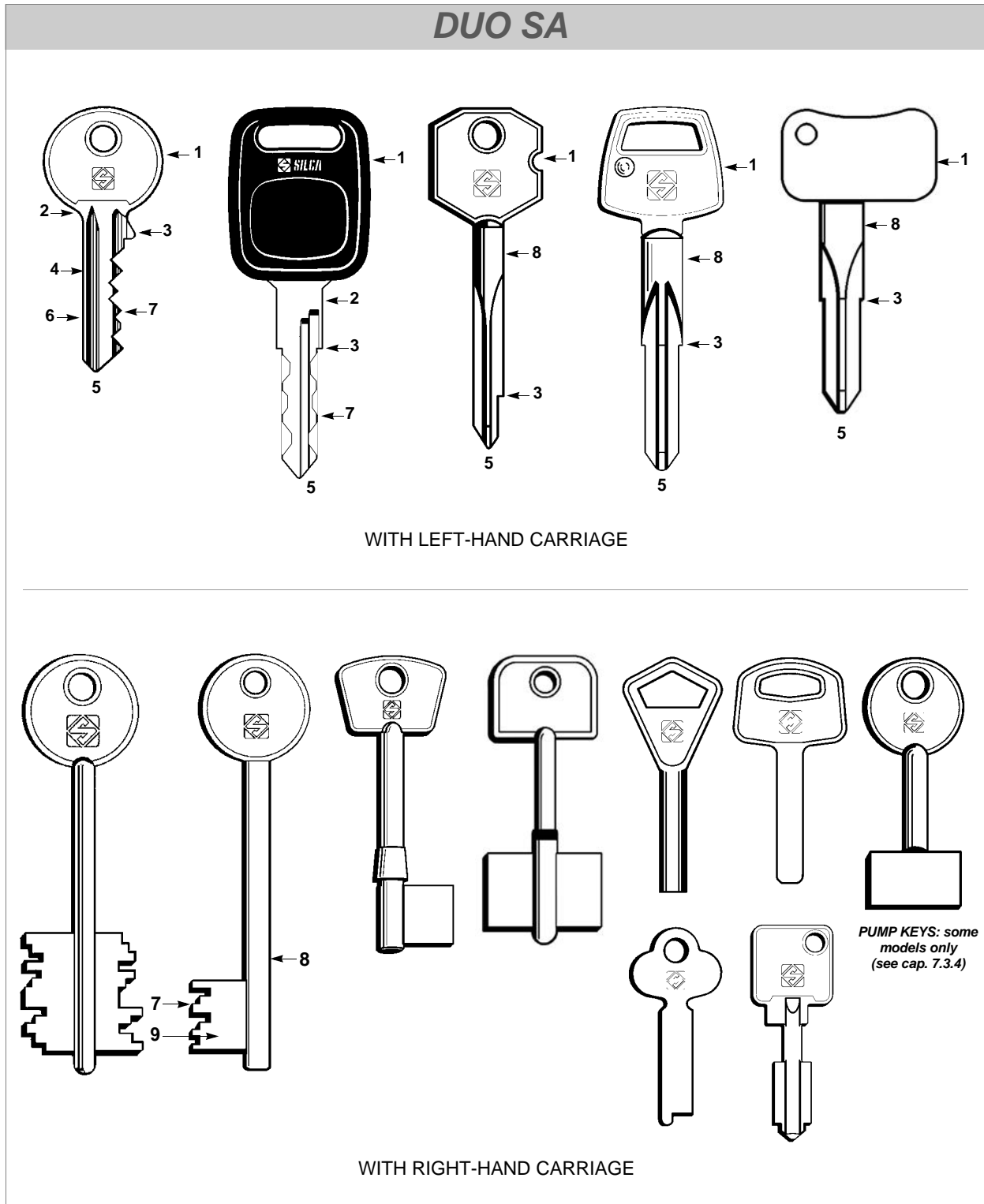


Fig. 3

1	Head	6	Back
2	Rim	7	Cuts
3	Stop	8	Stem
4	Blade	9	Bit
5	Tip		

GENERAL INTRODUCTIONS

The key-cutting machine has been designed according to the specifications of the Machine Directives. From the design stage risks for the operator have been eliminated in all areas: transport, key-cutting, regulation and maintenance.

Other risks have been eliminated by the use of protective devices for the operator.

The protective devices used are designed not to provoke further risks and, above all, they cannot be ignored unless deliberately cut out. They do not hinder visibility of the work area.

A special adhesive label is attached to the machine warning the operator to use goggles during the cutting operations, and this is strongly recommended in this manual.

The material used in the manufacture of this machine and the components employed during use of the machine are not dangerous and their use complies with standards.

Use

The key-cutting machine must be installed and used in the way laid down by the manufacturer.

If the key-cutting machine is used differently or for purposes different from those described in this manual, the customer will forego any rights he may have over SILCA S.p.A. Furthermore, unforeseen danger to the operator or any third parties may arise from incorrect use of the machine.

Negligence in the use of the machine or failure on the part of the operator to observe the instructions given in this manual are not covered by the guarantee and the manufacturer declines all responsibility in such cases.

It is therefore indispensable to read the operating manual carefully in order to make the best use of the key-cutting machine and benefit from its potential.

Instructions manual

The instructions manual provided with the machine is essential to its proper use and to carry out the necessary maintenance.

We therefore recommend protecting the manual from damage in a safe sheltered place, easily to hand for quick consultation.

Further Risks

There are no further risks arising from the use of the machine.

Protection and safety precautions for the operator

The key-cutting machine is built entirely to standards. The operations for which it has been designed are easily carried out at no risk to the operator.

The adoption of general safety precautions (wearing protective goggles) and observation of the instructions provided by the manufacturer in this manual eliminate all human error, unless deliberate.

The key-cutting machine is designed with features which make it completely safe in all its parts.

• Power supply

The key-cutting machine is powered by electricity supplied through a separable earthed plug.

• Start-up

The machine is started up:

- activating the safety main switch on the left-hand side of the machine;
- activating the motor on switch the left-hand side.

• Maintenance

The operations to regulate, service, repair and clean the machine have been devised in the simplest and safest way possible. There is no danger of removable parts being re-placed wrongly or unsafely.

• Machine Identification

The key-cutting machine is provided with an identification label which shows the serial number (fig. 4).

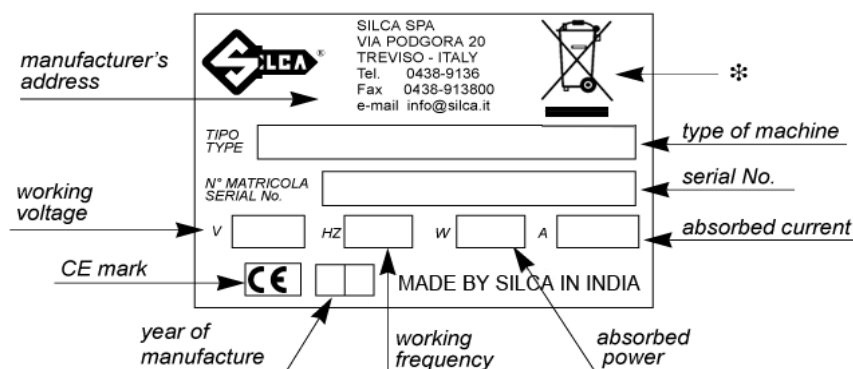


Fig. 4

(*) see cap. 9 "DISPOSAL", pag.49.

1 TRANSPORT

The key-cutting machine is easily transported and is not dangerous to handle. The packed machine can be carried by one person.

1.1 Packing

The key-cutting machine is packed in a strong cardboard box, the dimensions of which are shown in fig. 5, sufficiently robust to be used for storing the machine for long periods. Inside the box the machine is enclosed in two expanded polymer shells. The shells and cardboard box ensure safe transportation and protect the machine and all its parts.

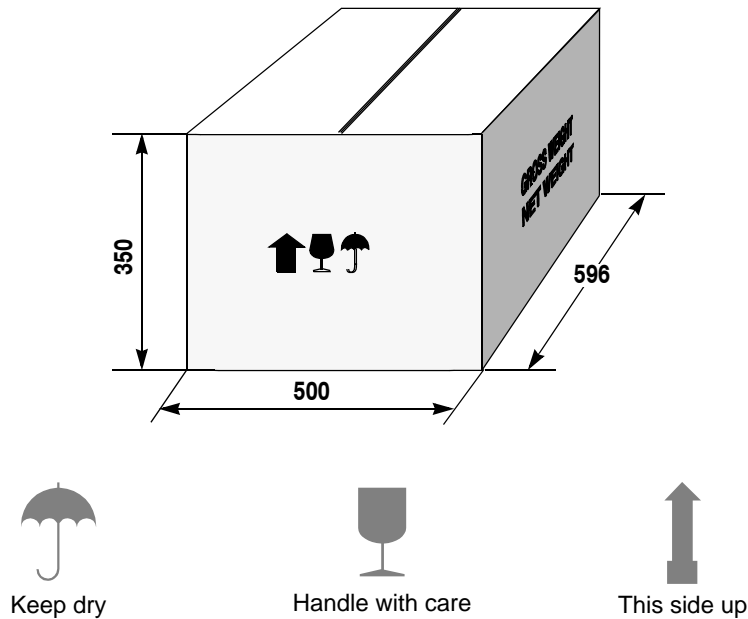


Fig. 5

1.2 Transport

To avoid damaging the key-cutting machine it must always be transported in its packing case. This will prevent sudden movements or rough handling from damaging the machine, persons or things.

1.3 Unpacking

To remove the machine from the packing box:

- 1) cut the straps with scissors and remove,
- 2) prise off the staples,
- 3) open the box without damaging it as it may be used again (e.g. removals, dispatch to the manufacturers for repairs or servicing),
- 4) check the contents of the box, which should comprise:
 - 1 key-cutting machine packed in a protective shell;
 - 1 set of documents, including: operating manual, spare parts list and guarantee;
 - 1 connecting wire;
 - 1 tool kit
- 5) remove the key-cutting machine from the protective shell.

1.4 Handling the machine

When the key-cutting machine has been unpacked, place it directly on its workbench.

This operation can be carried out by one person, firmly holding the base, and no other part, to lift and carry the machine.

2 WORKING PARTS

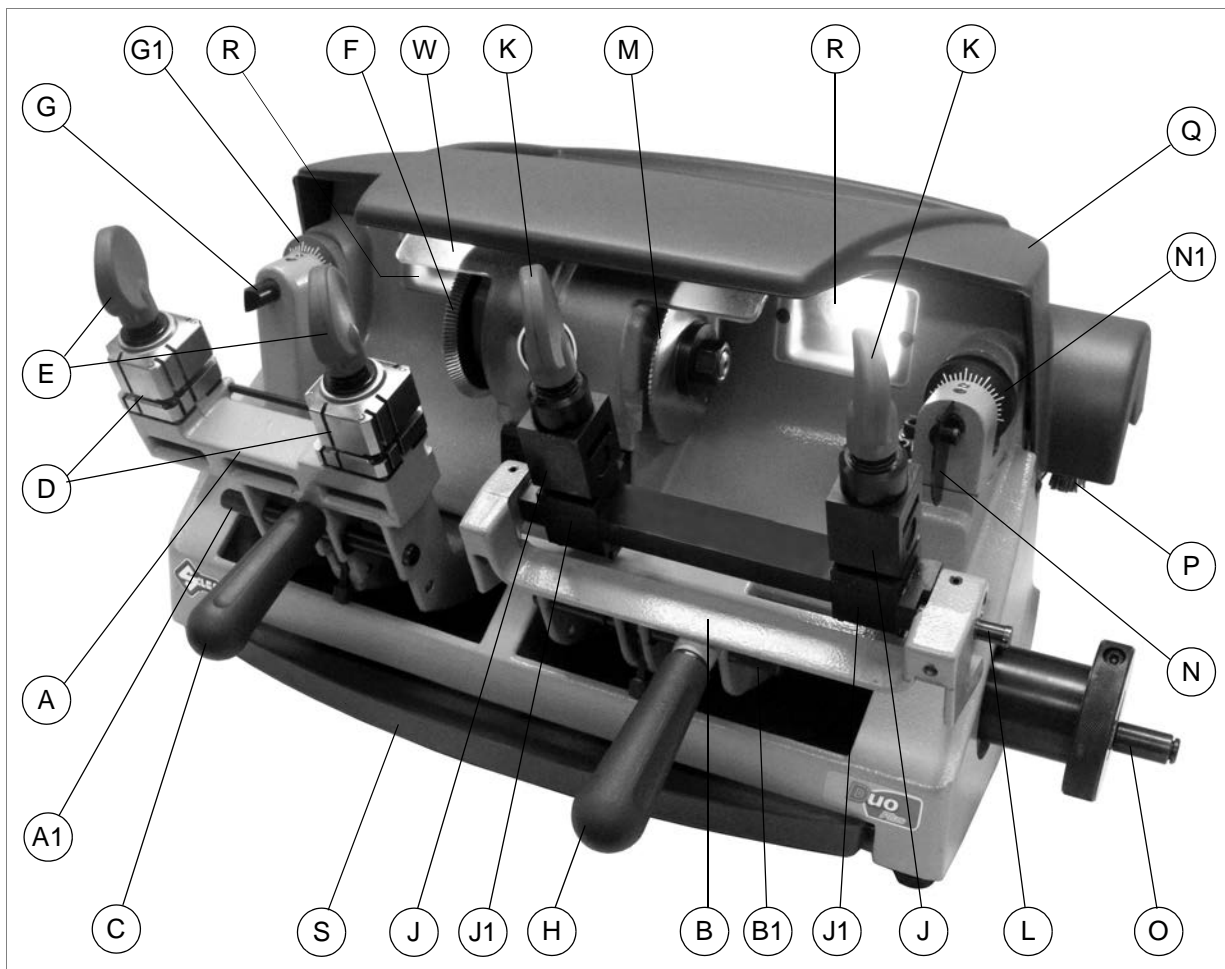
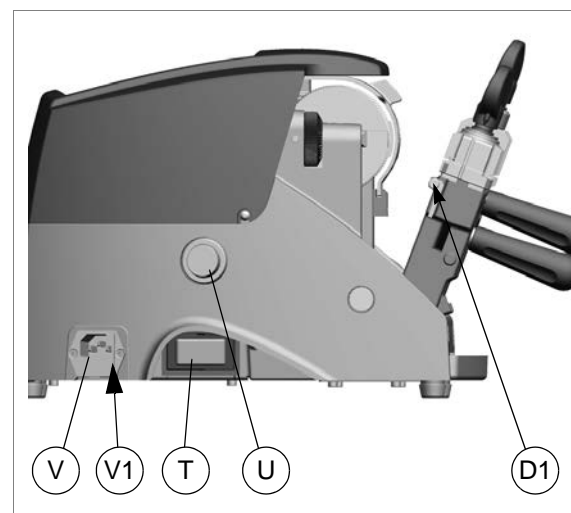


Fig. 6

- A - left-hand carriage
- A1 - carriage lock/release pin - left-hand side
- B - right-hand carriage
- B1 - carriage lock/release pin - right-hand side
- C - left-hand carriage movement lever
- D - clamps for flat keys
- D1 - gauges knob
- E - clamps knobs (left-hand carriage)
- F - prismatic cutter for flat keys
- G - left tracer point for flat keys
- G1 - centesimal ring - left tracer point
- H - right-hand carriage movement lever
- J - clamps for bit keys
- J1 - clamps for special keys
- K - clamps knobs (right-hand carriage)
- L - tilting movement activating pin (right-hand carriage)
- M - milling cutter for bit keys
- N - right tracer point for bit keys
- N1 - centesimal ring - right tracer point
- O - handwheel for carriage movement
- P - brush
- Q - top cover
- R - lamps
- S - chippings tray
- T - main switch
- U - motor on switch
- V - supply socket
- V1 - fuses
- W - cutters protective shield



3 MACHINE DESCRIPTION

Professional key-cutting machine designed to duplicate:

- **flat keys for cylinders and vehicles and cruciform keys: with left-hand carriage.**
- **bit, double bit, pump keys, mail box keys and special keys: with right-hand carriage.**

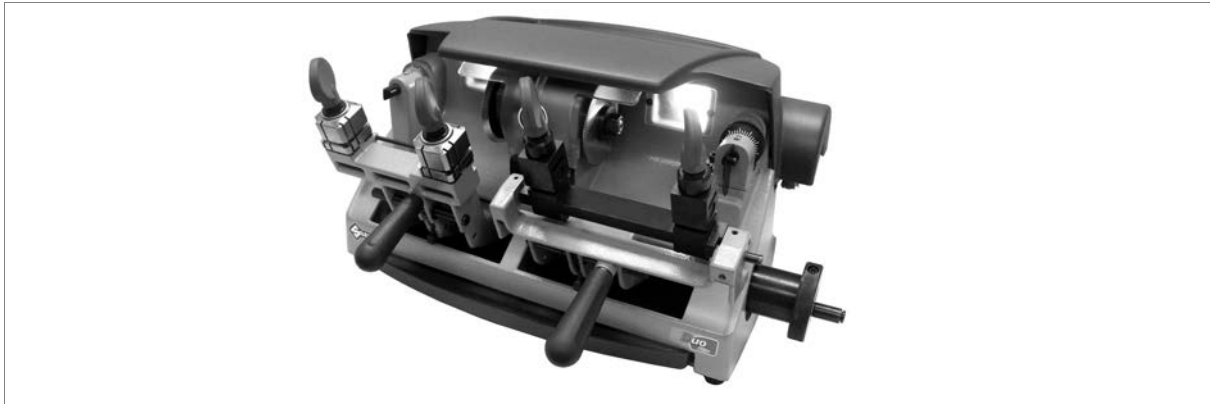


Fig. 7

The main parts of the machine are described below:

Main switch

The key-cutting machine is connected to a power supply socket provided with a differential switch. Pressing the switch (T) powers the machine and illuminates the lamps (R) to indicate that current is on.

ATTENTION: switch (T) is electromagnetic, in the event of a power failure it goes out automatically. When electricity is restored it must be reset manually to power the machine again.

Motor on switch

On the left-hand side of the key-cutting machine there is also a switch for starting up the motor (U).

ATTENTION: the illuminated switch remains on to indicate that the key-cutting machine has been started (cutter in motion).

Motor and transmission unit

Motor transmission takes place by belt.

On the right-hand side of the motor there is the transmission shaft which moves the brush (P).

On the left-hand side of the motor there is the shaft which moves the cutter spindle.

These components are protected by a top cover (Q).

Clamp carriages

The carriages comprise two clamps. They move horizontally and frontally controlled by handles (C and H).

The machine carriages can be locked into a fixed position and in this way achieve translation by means of the flywheel located on the right-hand side of the machine (chap.7.1.3, page 22).

The carriages are so designed as to avoid accumulation of dust or cutting swarf.

The machine is designed with a ramp along which chippings can fall into the special chippings tray (S) placed under the carriage and easily removable for emptying and cleaning.

Cutting unit

The cutting unit contains the actual working parts of the key-cutting machine, which operate together to cut and finish keys "read" from the originals.

The working parts are described below:

- **Cutting Tools**

The cutting tools (F) and (M) are the parts of the key-cutting machine used for cutting key blanks. The cutting tools are in HSS super rapid steel and are protected by a special cover (W) to ensure safe operation. The shield (W) is mobile and can be placed over the cutter that is not in use.

- **Tracer points**

The tracer points are dedicated to reading cuts on the key to be duplicated and are:

- tracer point (G) on the left-hand side of the machine, for flat keys for cylinders and vehicles and cruciform keys;
- tracer point (N) on the right-hand side of the machine, for bit, double bit, pump and mail box keys.

The depth of the tracer points is easily regulated by means of the relative graduated nut.

- **Clamps knobs**

The clamps are locked by two anatomical knobs (E) or (K), which ensure perfect grip on the keys with only slight locking pressure.

- **Calibration tabs**

The clamps have two gauge tabs (left-hand carriage) with which to adjust key alignment.

- **Brush**

The brush (P) is used to eliminate burrs from the cuts and is made of non-abrasive material.

- **Clamps**

LEFT-HAND CARRIAGE CLAMPS

The clamps (D) are rotating and four-sided to allow perfect closure of the key placed on its back or profile in the case of keys with symmetrical cuts (chap.7.2, page 24).

RIGHT-HAND CARRIAGE CLAMPS (fig. 8 et fig. 9)

The clamps (J) rotate and have 2/3 sides, to give perfect grip on bit keys, mail box keys and special keys (Abloy[®], Abus[®], Luma[®] and Ava Chubb[®] ref.5ACH4) (chap.7.3, page 28).

The clamp can be prepared in 4 different ways, according to requirements. They can be described as follows:

- A) Upper jaws (both flat)
- B) Upper jaws (flat and inclined - positioned in front of the cutter)
- C) Upper jaws (flat and inclined - to the left and parallel to the cutter)
- D) Lower jaws

CLAMP CONFIGURATION AND TYPE OF KEY TO BE CUT

Upper jaws (flat side) (A):

Mail box keys (flat keys) (chap.7.3.3, page 35)

Upper jaws (inclined side - in front of cutter) (B):

Bit keys - Double bit - with rim (chap.7.3.1, page 32)

Upper jaws (left-hand inclined side - parallel with cutter) (C):

Pump keys (chap.7.3.4, page 36)

Lower jaws (D)

Special keys: ABLOY[®] - ABUS[®] - LUMA[®] - AVA CHUBB[®] (Silca ref. 5ACH4)

For Abloy[®], Abus[®] and Luma[®] the keys position the keys in the clamps according to the existing cuts (right or left) with the head in the right or left hand side of the clamp (chap.7.3.5, page 37).

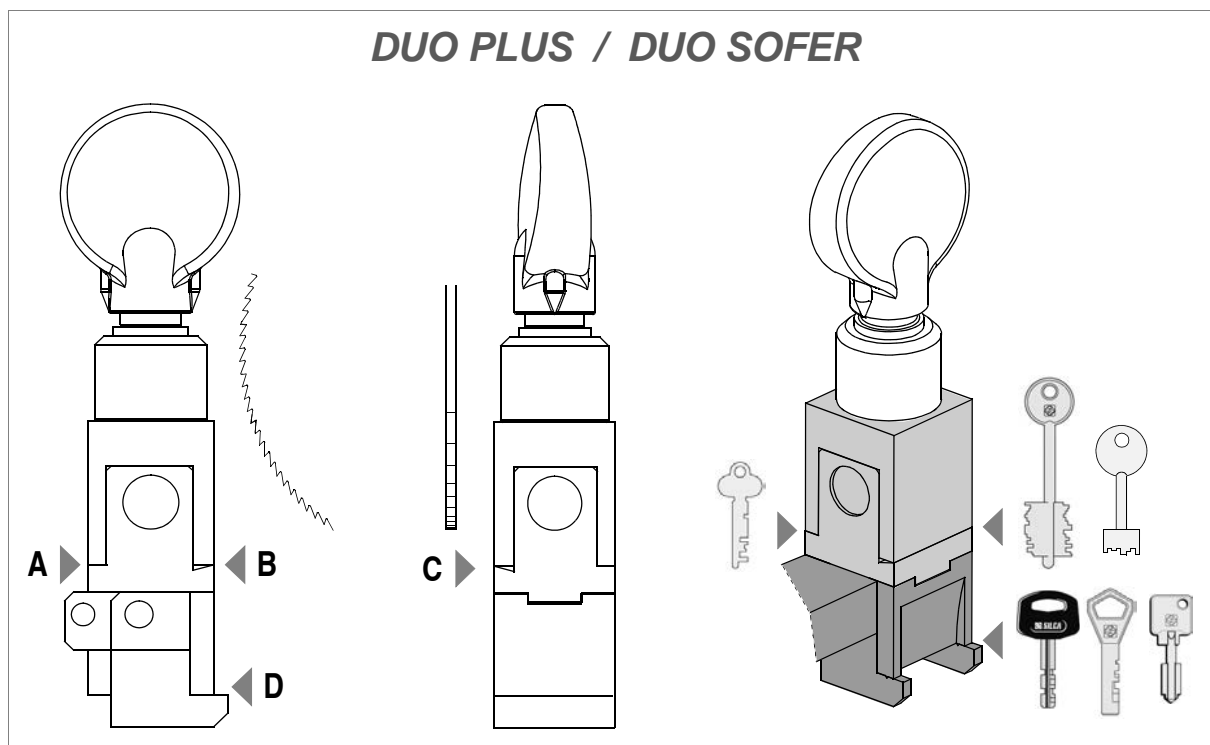


Fig. 8

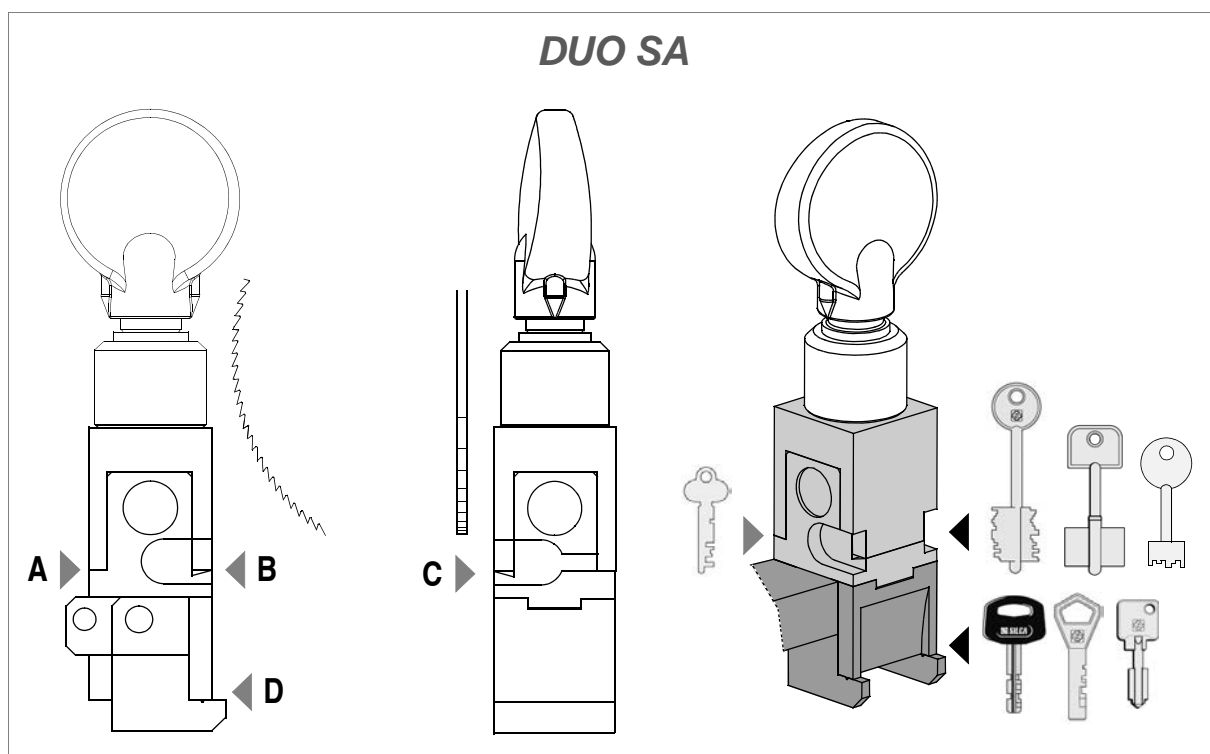


Fig. 9

3.1 Technical Data

ELECTRICAL PROPERTIES:

- 230V-50Hz 300W 1,2A
- 120V-60Hz 250W 2,3A

CUTTING TOOLS: HSS Super Rapid Steel

MOTOR: One-speed single phase

- 230V-50Hz (1400 rpm)
- 120V-60Hz (1700 rpm)

MOVEMENTS: by gear on rectified carriage

CLAMPS: rotating 4 sides (left carriage), 2/3 sides (right carriage)

MAXIMUM LENGTH OF CUTS:

- flat cylinder keys: 42 mm
- bit and double bit keys, pump keys and special keys: 25 mm

DIMENSIONS: width: 510 mm - depth: 450 mm - height: 280 mm

SONOROUS PRESSURE: Leq. = less than 70 dbA

WEIGHT: Kg.23

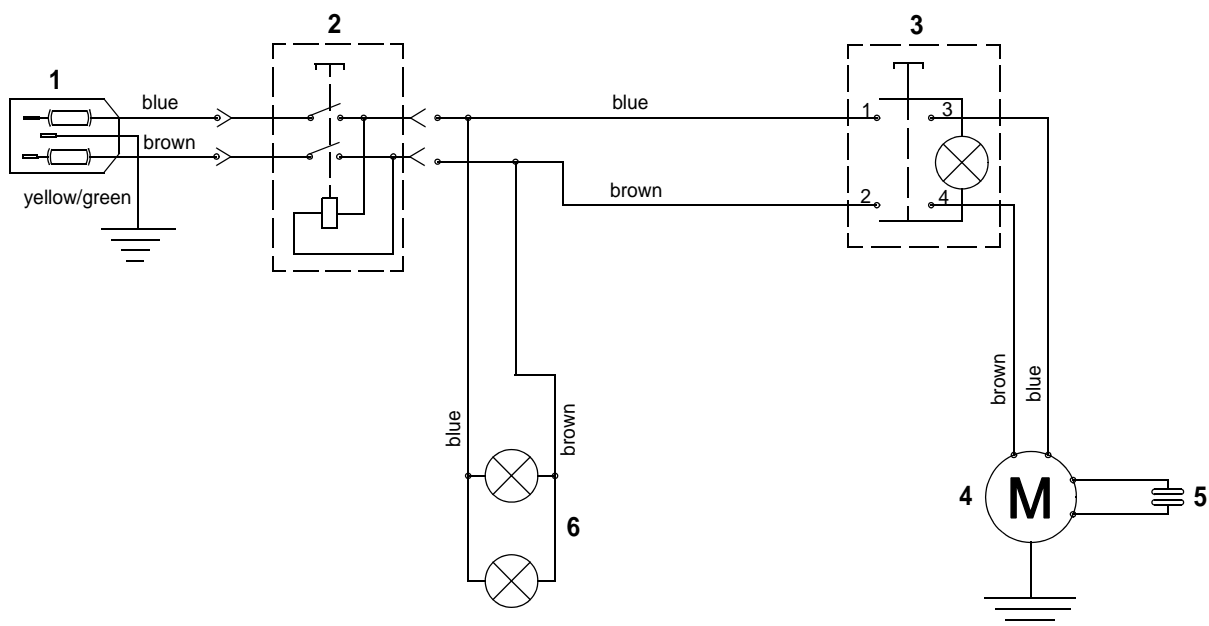
3.2 Graphics



3.3 Electric circuit

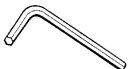
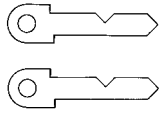

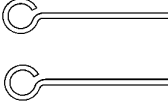

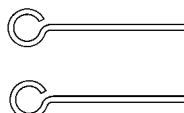

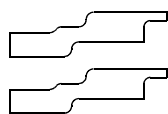



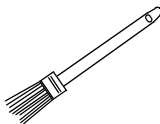
The main parts of the electric circuit on the key-cutting machine are listed below:

- 1) Main socket with fuses
- 2) Safety main switch
- 3) Illuminated switch
- 4) Motor: 230V- 50Hz (120V-60Hz)
- 5) Condenser
- 6) Lamps



4 ACCESSORIES PROVIDED

it is advisable to always have certain spare parts on hand. It is advisable to always have a tool box containing: tools, cutting tools, brushes, belts and small replacement parts.
The key-cutting machine is supplied with a full range of accessories. The accessories provided by Silca are all that is necessary to carry out the operations for which the machine is designed.

 <p>2,5 mm ALLEN KEY</p>	 <p>ADJUSTING BAR 2 pcs</p>
 <p>3 mm ALLEN KEY</p>	 <p>STEEL PIN Ø 1,20 2 pcs</p>
 <p>4 mm ALLEN KEY</p>	 <p>STEEL PIN Ø 1,70 2 pcs</p>
 <p>5 mm ALLEN KEY</p>	 <p>STEEL BAR 2 pcs</p>
 <p>19 mm SPANNER</p>	 <p>FUSES 5X20 (2 pcs) 4 Amps rapid (230V) 8 Amps rapid (120V)</p>
 <p>CUTTING TOOL UNCLAMPING PIN</p>	 <p>CLEANING BRUSH</p>

5 MACHINE INSTALLATION AND PREPARATION

The key-cutting machine can be installed by the purchaser and does not require any special skills. However, some checks and preparation for use need to be carried out by the operator.

5.1 Checking for damage

The key-cutting machine is solid and compact and will not normally damage if transport, unpacking and installation have all been carried out according to the instructions in this manual. However, it is always advisable to check that the machine has not suffered any damage.

5.2 Environmental conditions

To ensure that the best use is made of the key-cutting machine, certain parameters must be borne in mind:

- damp, badly ventilated sites should be avoided.
- The ideal conditions for the machine are:
 - temperature: from 10 to 40°C
 - relative humidity: approx. 60%

5.3 Positioning

Place the key-cutting machine on a horizontal surface, solid enough to take the weight (23 Kg). To facilitate operation and maintenance, install the machine with a space of at least 200 mm on all sides (fig. 10).

Ensure that the machine stands perfectly balanced on the four feet. Vibration is avoided when the machine is properly set on the horizontal plane.

ATTENTION: ensure that the machine voltage is the same as that of the mains, which must be properly earthed and provided with a differential switch.

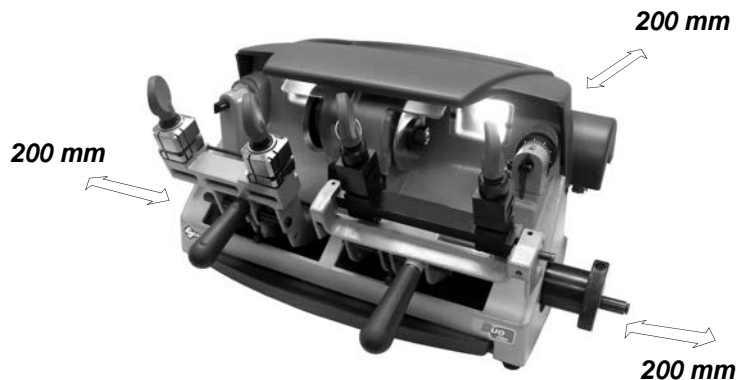


Fig. 10

5.4 Description of work station

The key-cutting machine needs only one operator, who has the following controls at his/her disposal:

- Main switch (T), located on the left-hand side of the machine, it activates the machine and turn on the lamps (R).
- Motor on switch (U), located on the left-hand side of the machine has a warning light to show that the key-cutting machine is live.

LEFT-HAND carriage:

- Carriage lever (C)
- Carriage release pin (A1)
- Gauges knob (D1)
- Carriage advancement flywheel (O) (with carriage locked - chap. 7.1.3, page 22).

RIGHT-HAND carriage:

- Carriage lever (H)
- Carriage release pin (B1)
- Carriage advancement flywheel (O) (with carriage locked - chap. 7.1.3, page 22).
- Tilting movement activating pin (L)

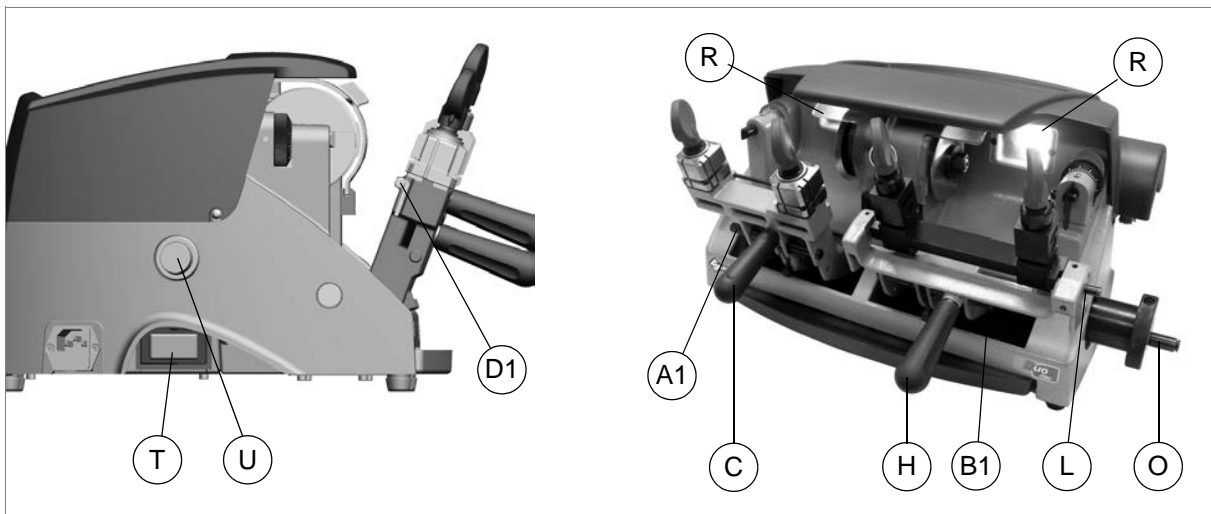


Fig. 11

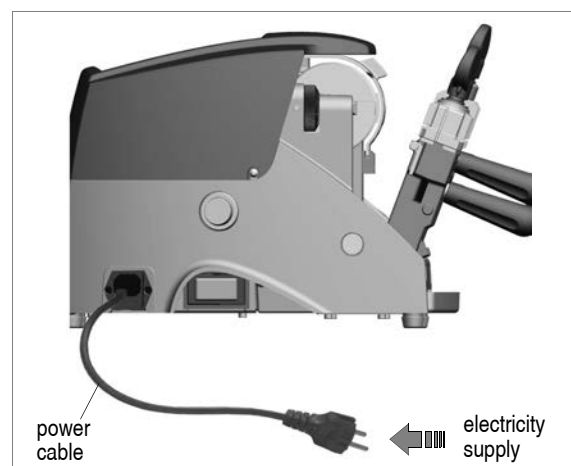
5.5 Separate parts

The separately packed parts must be installed on the key-cutting machine by the purchaser, as follows:

Connection wire

Connect the key-cutting machine power cable to the electricity mains (fig. 12).

Fig. 12



5.6 Connection to the mains

For the safety of the operator and the machine it is important to ensure that the machine is connected to the proper mains voltage by means of an earthed differential switch.

5.7 Cutter shield

The shield (W) is mobile and can be placed over the cutter when not in use:

- to operate the left-hand carriage, take shield (W) to the right (fig. 13)
- to operate the right-hand carriage, take shield (W) to the left (fig. 14)

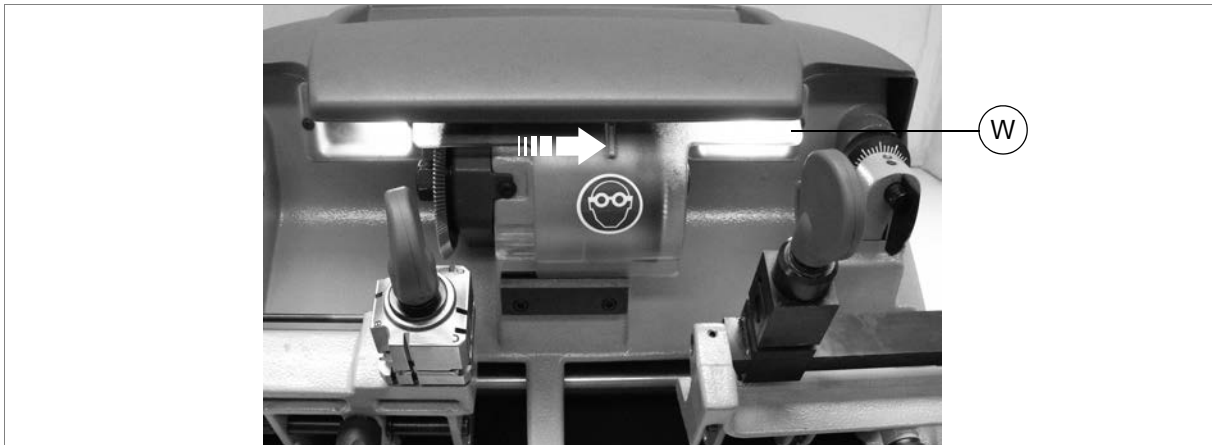


Fig. 13

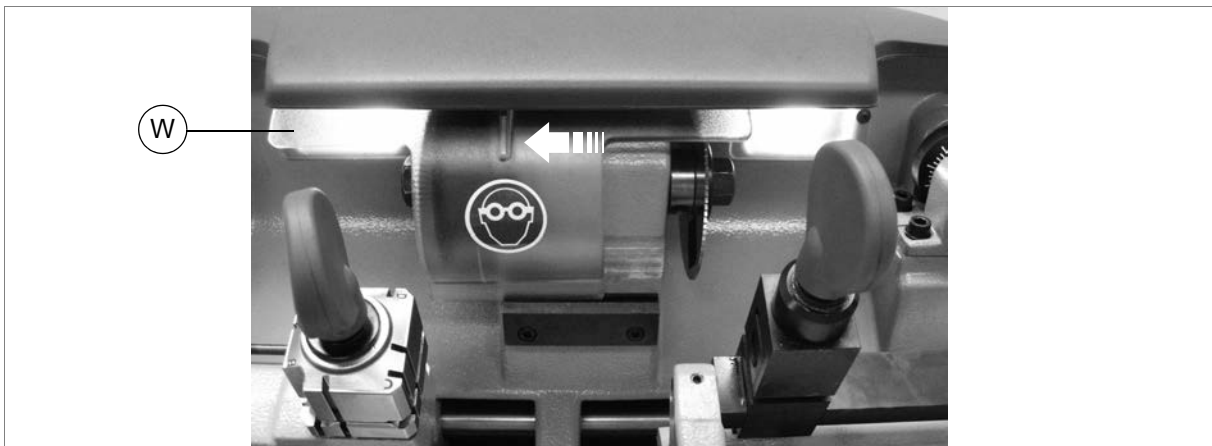


Fig. 14

6 MACHINE REGULATION AND UTILIZATION

6.1 Checking and setting

The cutting tools on the machine are the parts used to cut the key blanks and should be periodically checked and replaced, if necessary.

Every time the cutting tool is changed, and during periodical operational tests, check calibration.

6.2 Calibration: LEFT-HAND CARRIAGE

The key-cutting machine requires two types of calibration: axis and depth.

Axis calibration:

Axis calibration is regulation of the space between the stop and the cuts (fig. 15).

The axis setting is fixed and is established on assembly in our workshops.

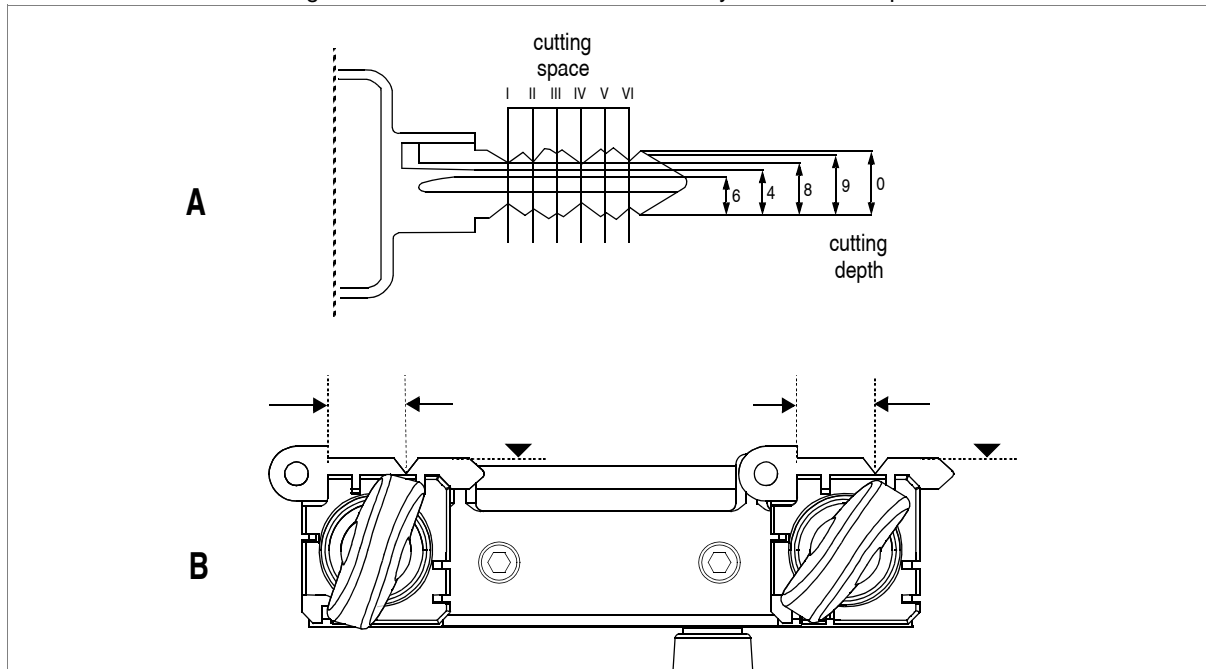


Fig. 15

Depth calibration:

Depth calibration is regulation of the cutting depth (fig. 15-A).

Proceed as follows:

- 1) Ensure that the key-cutting machine is off by unplugging the power cable.
- 2) Place the adjusting keys (provided) on the clamps (fig. 15-B).
- 3) Check that the adjusting keys adhere properly to the clamps.
- 4) Turn the gauge rod (D2) towards the operator so that the gauges come into contact with the adjusting keys (fig. 16). Lower the gauge rod.

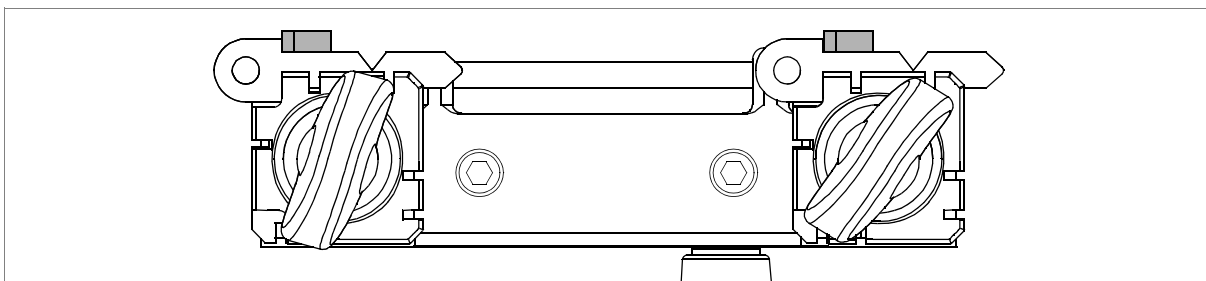


Fig. 16

- 5) Release the carriage by raising the release lever.
- 6) Raise the carriage and take up to the cutting tool (fig. 17).
- 7) Turn the cutting tool anticlockwise manually and check that it skims the adjusting keys in several places.
- 8) If necessary, regulate the depth of the cut with the micrometric tracer point, as follows:
 - a) loosen the screw (G2) holding the tracer point.
 - b) turn the ring nut (G1) clockwise to advance the tracer point (fig. 17 and fig. 18).

c) turn the ring nut (G1) anticlockwise to return (fig. 19).

ATTENTION: each notch on the centesimal ring corresponds to 0,025 mm (fig. 17).

9) Repeat these operations until regulation is complete, then tighten the tracer point locking grub screw (G2).

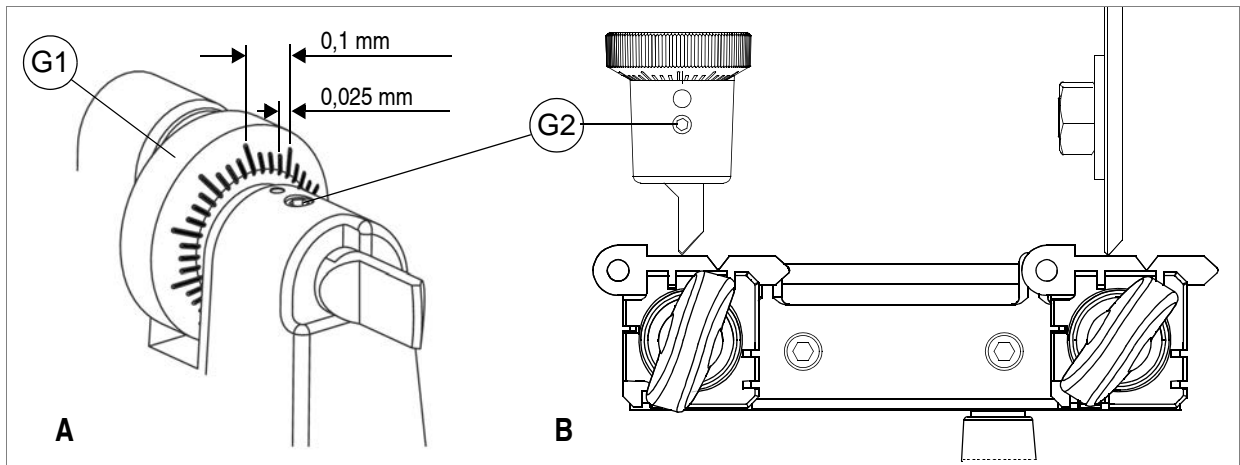


Fig. 17

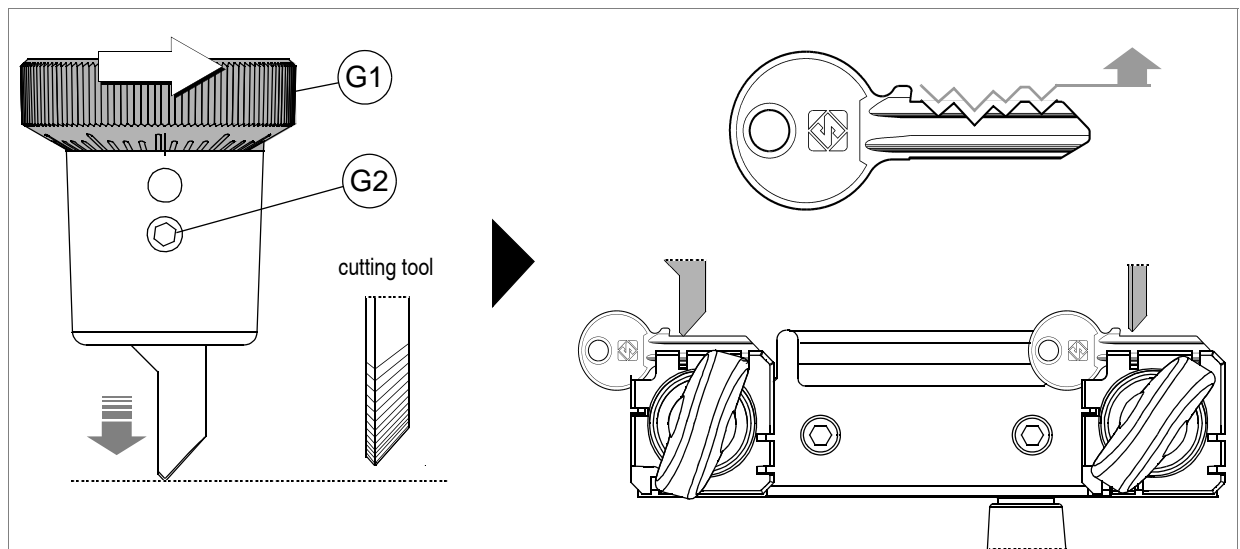


Fig. 18

Turn the nut to the RIGHT (clockwise) to take the tracer point down. Result: **LESS DEEP CUTS.**

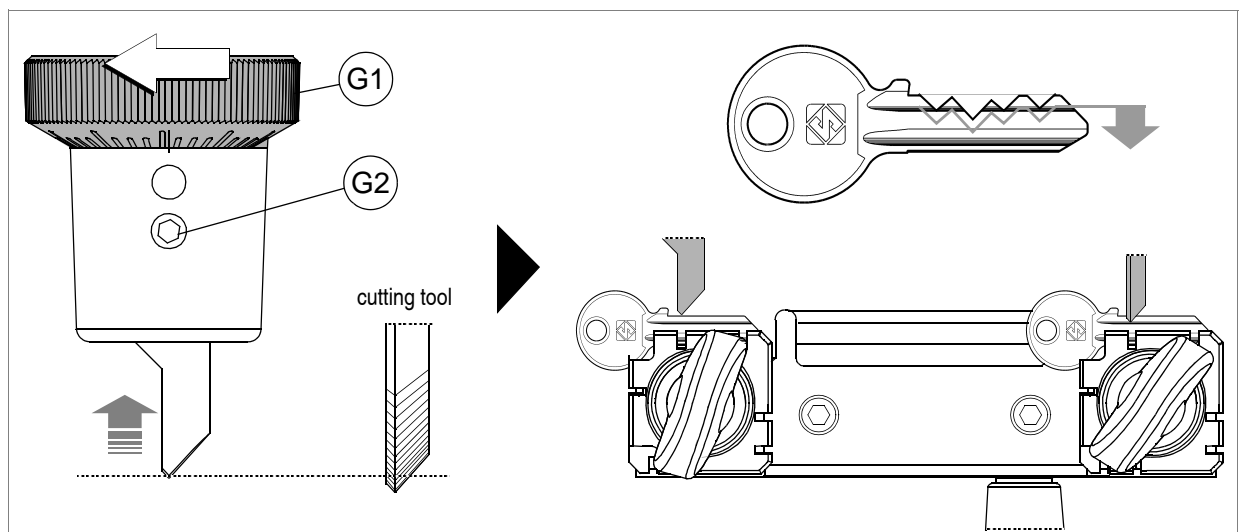


Fig. 19

Turn the nut to the LEFT (anticlockwise) to take the tracer point up. Result: **DEEPER CUTS.**

6.3 Calibration: RIGHT-HAND CARRIAGE

Axis calibration

Axial gauging is regulation of the spaces for the cuts on the key (fig. 20).

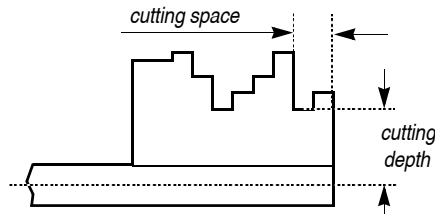


Fig. 20

Axis gauging control

- 1) Turn off the machine and unplug the power lead.
- 2) Make sure the tracer point and cutter are of the same thickness.
- 3) Lock the tilting movement of the clamps by inserting the pin (L) into its seat.
- 4) Close the 2 clamps with their knobs (K).
- 5) Release the carriage by turning the pin (B1).
- 6) Use the lever (H) to raise the carriage and take the right-hand side of the clamp up against the left-hand side of the tracer point and cutter (fig. 21).
- 7) The ideal condition is for both tools (tracer point and cutter) to be in contact with the relative side of the clamp. If this is not so, loosen the 2 tracer point holder screws (N2) (fig. 21) and move the tracer point holder manually (right or left) until the ideal condition is found.
- 8) Tighten the 2 screws (N2).

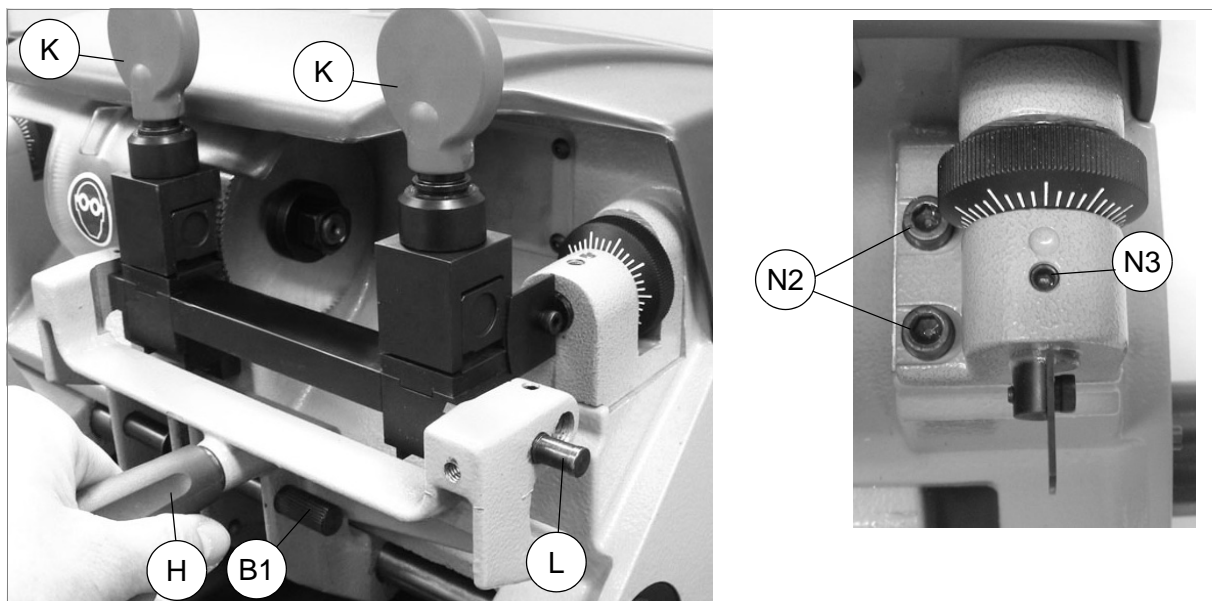


Fig. 21

Depth calibration

Depth calibration is regulation of the cutting depth (fig. 20).

Proceed as follows:

- 1) **Ensure that the key-cutting machine is off by unplugging the power cable.**
- 2) Place the adjusting keys on the clamps (fig. 22) on the 2nd side (for mail box keys) - fig. 40);
- 3) Lock the clamps in the horizontal position by means of the pin (L);
- 4) Raise the carriage and take the adjusting keys into contact with the tracer point and cutting tool (fig. 22).
- 5) Turn the cutting tool manually in the opposite sense to the rotation and check that it skims the adjusting key in several places.
- 6) If necessary, regulate the cutting depth by means of the tracer point, as described; loosen grub screw (N3) and:
 - turn the ring nut (N1) clockwise to advance the tracer point (fig. 23).
 - turn the ring nut (N1) anticlockwise to return (fig. 24).
- 7) Repeat these operations until the cutting tool skims the adjusting key in several points.

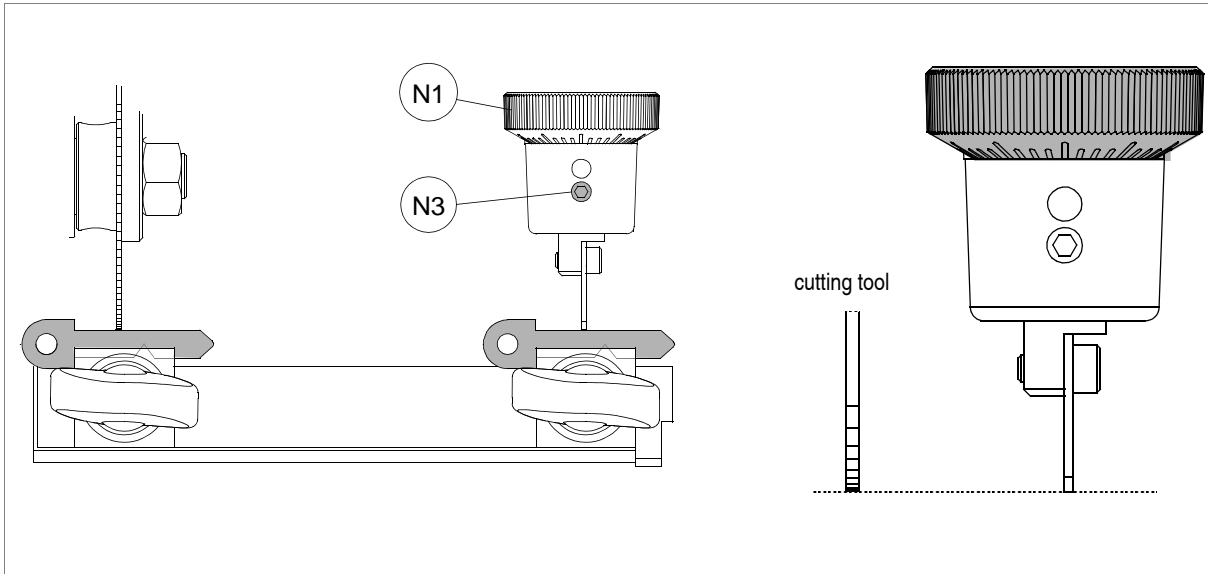


Fig. 22

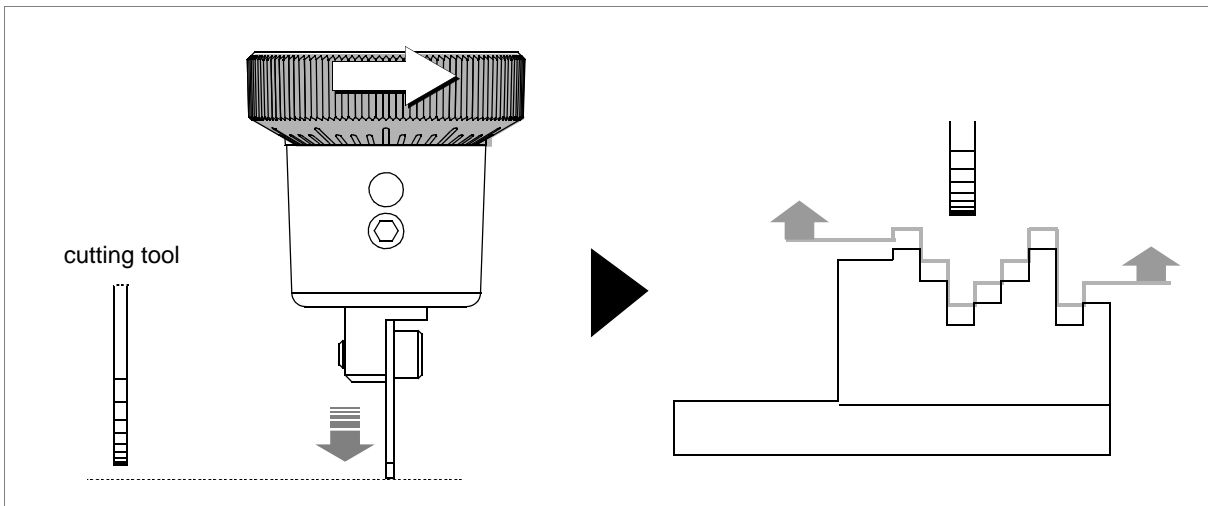


Fig. 23

Turn the nut to the RIGHT (clockwise) to take the tracer point down. Result: **LESS DEEP CUTS.**

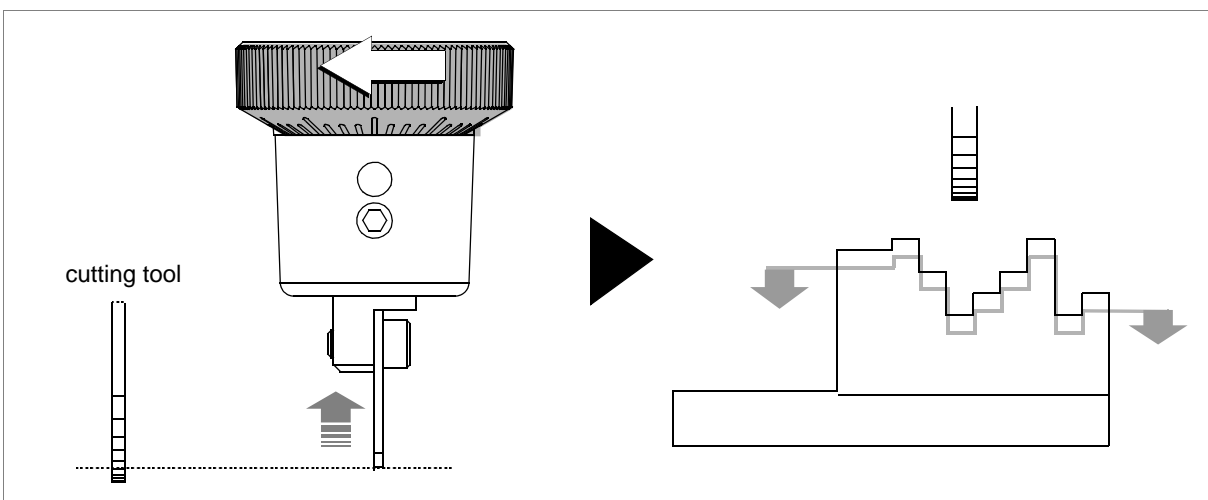


Fig. 24

Turn the nut to the LEFT (anticlockwise) to take the tracer point up. Result: **DEEPER CUTS.**

7 CUTTING OPERATIONS

ATTENTION: for complete safety during the cutting operations, take the following precautions:

- Always work with dry hands.
- Check that the machine is properly earthed.
- Wear protective goggles even if the machine has a protective shield over the cutting tool.
- Start the motor (switch U) only after completing the operations on the carriage (securing the keys, etc...).
- Keep hands away from the cutting tool in motion.

7.1 Key cutting

Cutting can be carried out in two ways:

- with the carriage in a fixed position (locked carriage)
- with the carriage in a mobile/free position (carriage released)

ATTENTION: if cutting is carried out with the carriage in a fixed position, before proceeding release the carriage not to be used.

ATTENTION: if cutting is carried out with the carriage in a free position, use handle (C) or (H) to raise and move the carriage.

7.1.1 Carriage release (right or left-hand side)

- turn the carriage lock/release pin to the right (A1 or B1) (fig. 25).

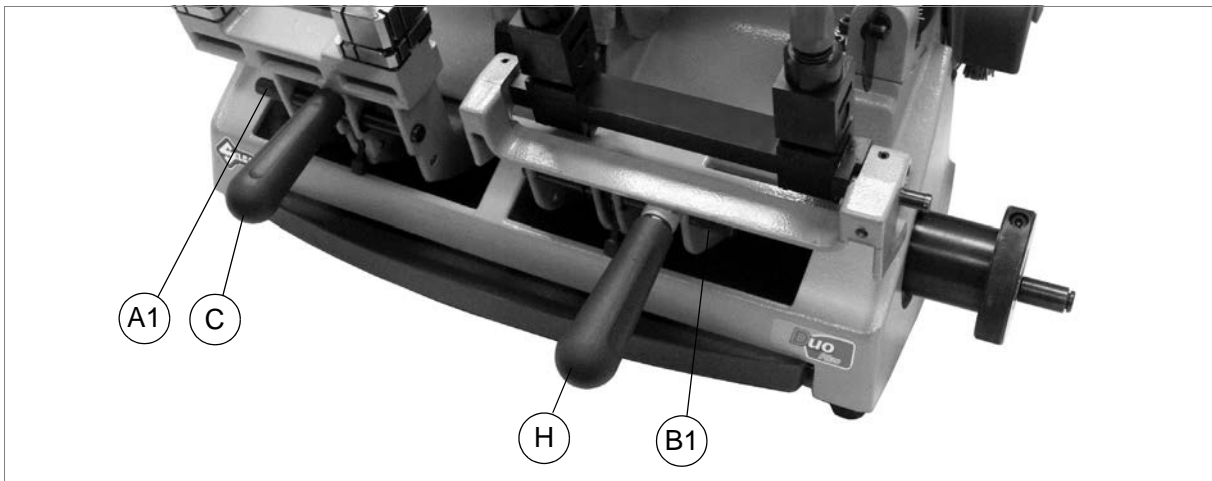


Fig. 25

The clamps must be prepared according to the type of key to be cut (fig. 26).

7.1.2 Clamp rotation

- 1) Loosen the clamp closing knob by a few turns.
- 2) Raise the clamp (both jaws) and turn so that the required side is facing the tracer point and cutter.

Note: carry out the operation on both clamps (on the left-hand or on the right-hand carriage).



Fig. 26



Fig. 27

7.1.3 Carriage translation

- If the carriage to be used for cutting is in the **fixed position** (carriage locked), to move it:
 - take the carriage up to the tracer point and cutter by means of the handle (C or H).
 - turn the flywheel (O) to move the carriage sideways and carry out cutting.
- If the carriage to be used for cutting is in a **mobile/free position** (carriage released), to move it:
 - use the handle (C) or (H) to both raise and move the carriage.

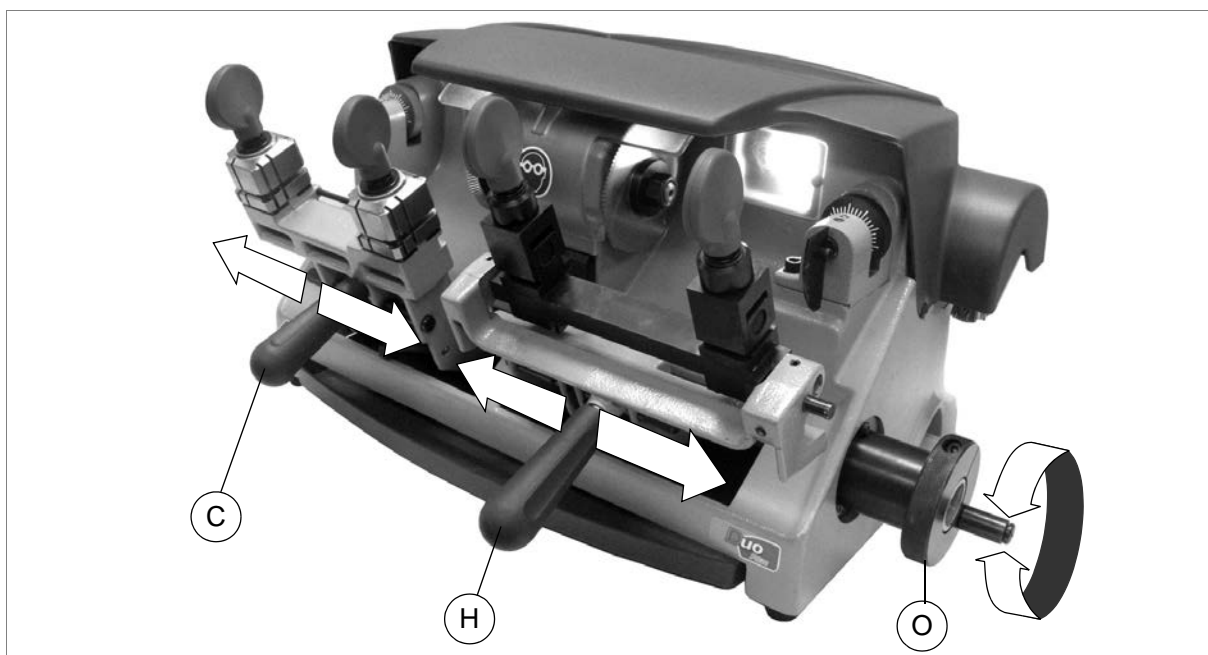


Fig. 28

7.1.4 Flared cuts cutting bit keys (right-hand carriage)

Tilting clamps

The clamps on the right-hand carriage, used to cut bit, double bit and rim keys, may be of the tilting type so that the cuts can be flared.

- **To activate tilting:** pull out the pin (L).
- **To deactivate tilting:** insert the pin (L) to lock the clamps in the fixed horizontal position.

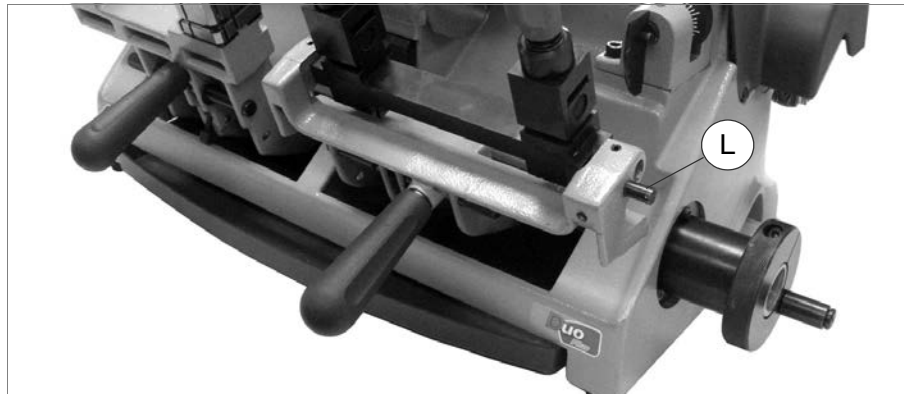


Fig. 29

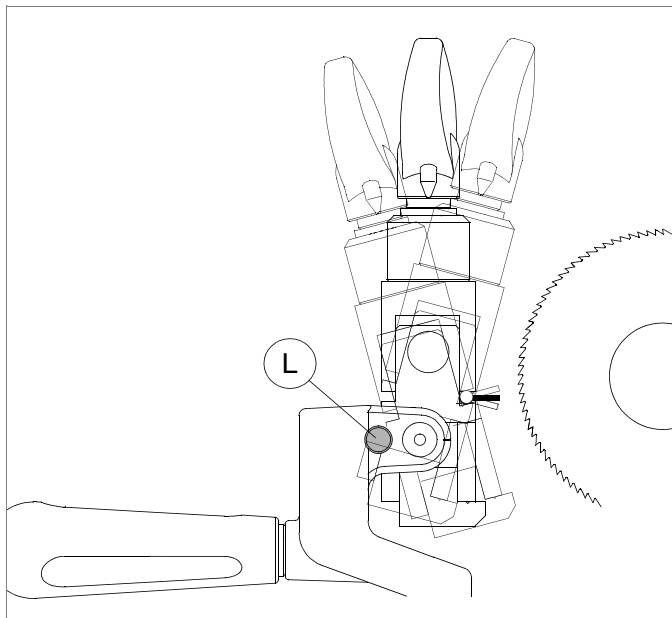


Fig. 30

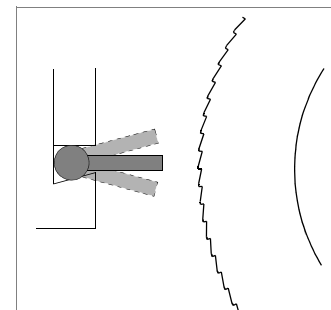


Fig. 31

7.2 LEFT-HAND CARRIAGE - Cutting flat cylinder and vehicle keys

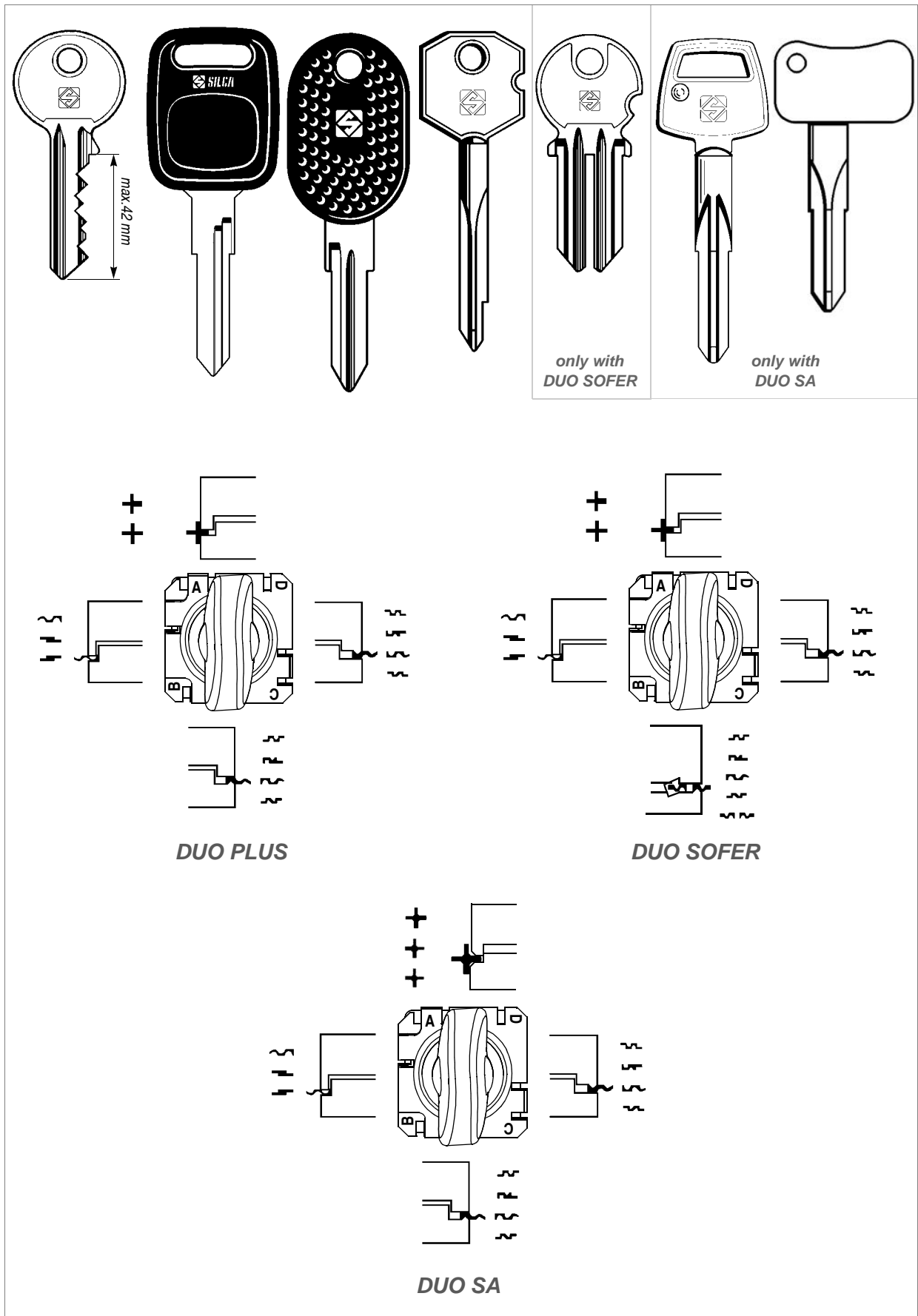


Fig. 32

- 1) Turn the clamps to find the appropriate side for securing the key (fig. 32).
- 2) Loosen the knobs (E) by a couple of turns.
- 3) Raise the lower part of the clamps and turn to the required position (fig. 26):
 - **Side A of the clamp:** for keys to be fitted on their backs, keys with double cuts without groove and cruciform keys (fig. 32);
 - **Side B of the clamp:** for keys placed on their backs and having cuts with a depth of less than 3,9 mm (fig. 32);
 - **Side C and D of the clamp:** for keys to be cut on both sides and locked on the groove (fig. 32).

Securing the keys in the clamps

- 1) Position the original key (left-hand jaw) and key blank (right-hand jaw), ensuring that:
 - a) the keys are well positioned and secured in the clamp;
 - b) the key stop is resting against the calibration tabs (D2) (fig. 33);
- 2) secure the keys by closing the clamps with the knobs (E).

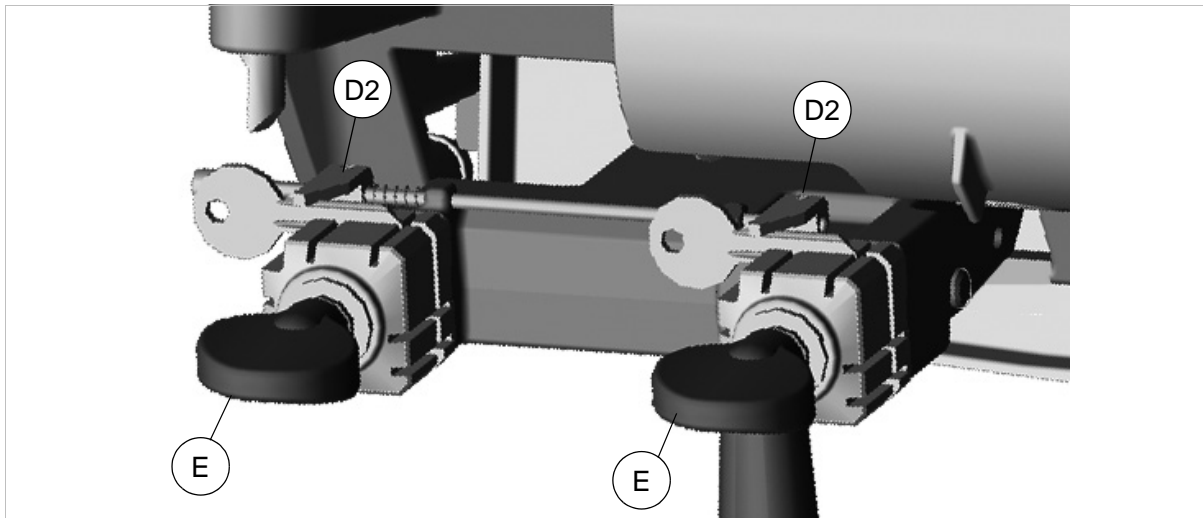


Fig. 33

Key cutting

ATTENTION: make sure the gauge rod has been lowered.

When the key-cutting machine has been turned on by means of switch (U) it is ready for cutting:

- 3) Take the carriage towards the tracer point/cutter (fig. 34).
- 4) Move the carriage from right to left to cut the key (see cap. 7.1.3). In case of double cuts repeat the operation in the second side of the key.
- 5) Turn off the machine with witch (U) before removing the duplicated key.
- 6) Remove the keys from the clamps.
- 7) Turn on the machine with switch (U) and smooth off the key edges by means of the brush (P).

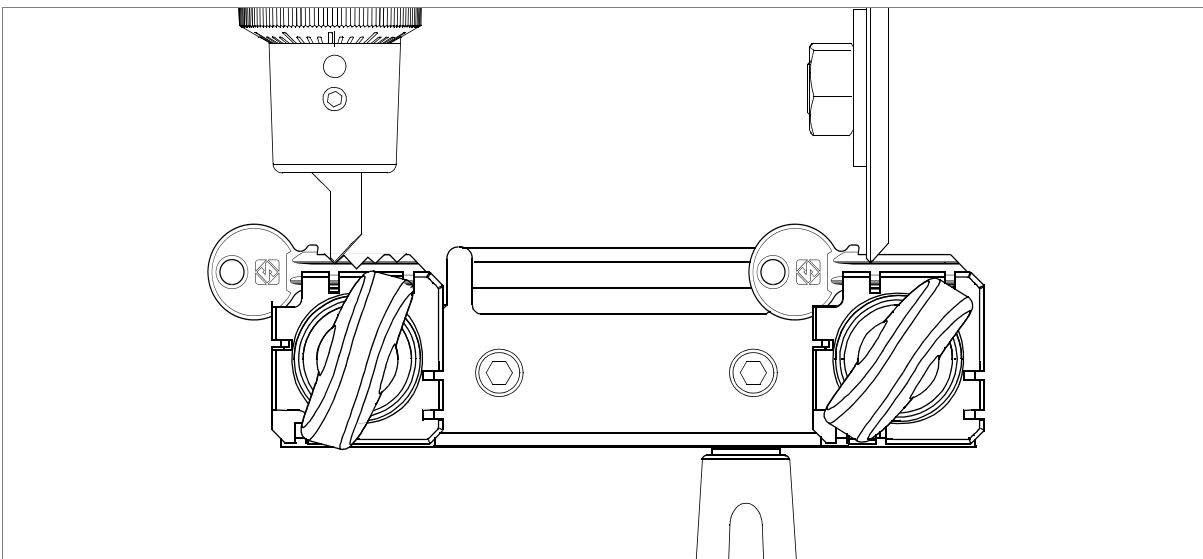


Fig. 34

7.2.1 Using the accessories

The accessories provided with the key-cutting machine to assist key-cutting are:

- pins
- bars

Using the pins

The pins must be inserted between the bottom of the jaw and the back of the key for keys with narrow stems, and their purpose is to ensure that the key protrudes sufficiently to be cut properly (fig. 35-B, fig. 35-C).

For keys with narrow, thin stems, two pins must be used (fig. 35-B) the second one to give a secure grip on the key. If the key thickness is too fine to guarantee a good grip in the clamps, a pin must be used (fig. 35-A).

ATTENTION: the pins provided have two different diameters: 1,20 mm and 1,70 mm; It is essential to use pins with the same diameters for locking both the original and the key blank.

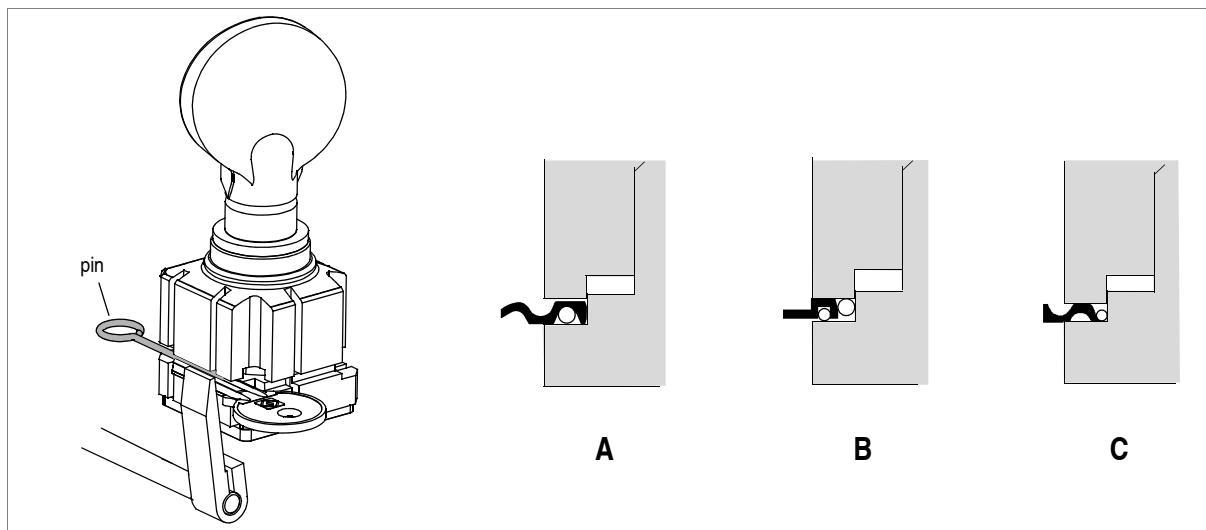


Fig. 35

Using the bars

The bars provided are used for cutting pin keys and as a tip rest for locking keys with no stop (fig. 36).

Cutting cruciform keys using bars

The cruciform keys (90°) can be cut with the clamps and the aid of the bars.

Positioning cruciform keys:

- 1) Leave the gauges in the idle position.
- 2) Insert the bars with neck into the slot in the clamps.
- 3) Butt the key stop against the bars.
- 4) Secure the keys in the clamps.
- 5) Remove the bars from the clamp grooves to prevent it being touched by the tracer point or cutting tool.
- 6) Cut the first side.
- 7) Repeat the operation, turning the keys in the same direction for the other positions.

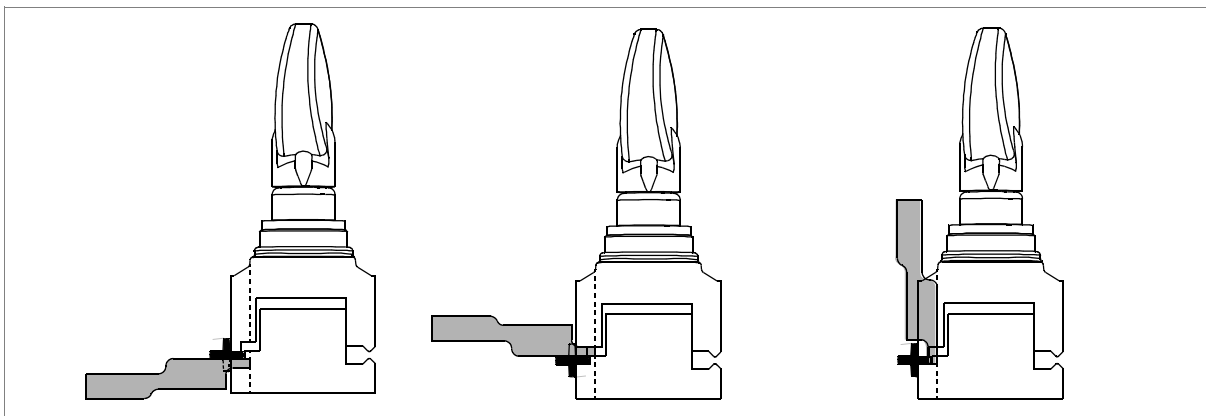


Fig. 36

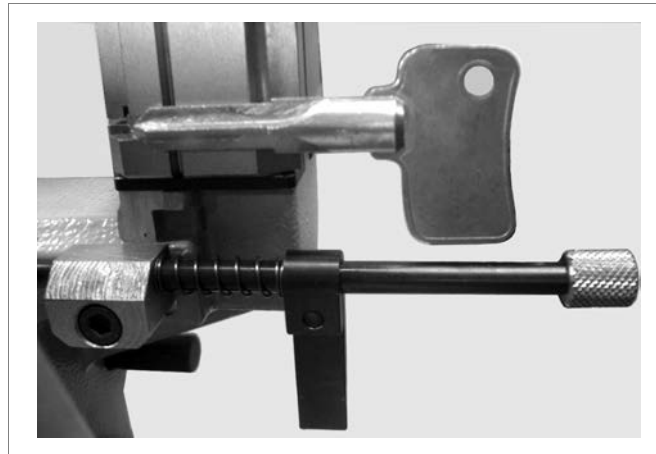
Cutting cruciform keys with big head**ATTENTION:** only with DUO SA

Fig. 37

Tip stop with a bar

The bars can be used with keys which have no stop (fig. 38); proceed as follows:

- 1) Leave the gauges in the idle position;
- 2) Insert the bars into the slot in the clamps;
- 3) Rest the tip of the key against the bar;
- 4) Secure the key and remove the bar.



Fig. 38

7.3 RIGHT-HAND CARRIAGE - Cutting bit and double bit keys, pump keys, mail box and special keys

- 1) Turn the clamps to find the appropriate side for securing the key (fig.27, page 22).
- 2) Loosen the knobs (E) by a couple of turns.
- 3) Raise the lower part of the clamps and turn to the required position:
 - Clamp side for bit, double bit keys and bit keys with central stop (position B) (fig. 42)
 - Clamp side for pump keys (position C - turned 90°) (fig. 43)
 - Clamp side for mail box keys (position A) (fig. 42)
 - Clamp side for special keys such as Abloy®, Abus®, Luma®, Ava Chubb® (Silca ref.5ACH4) (position D) (fig. 44).

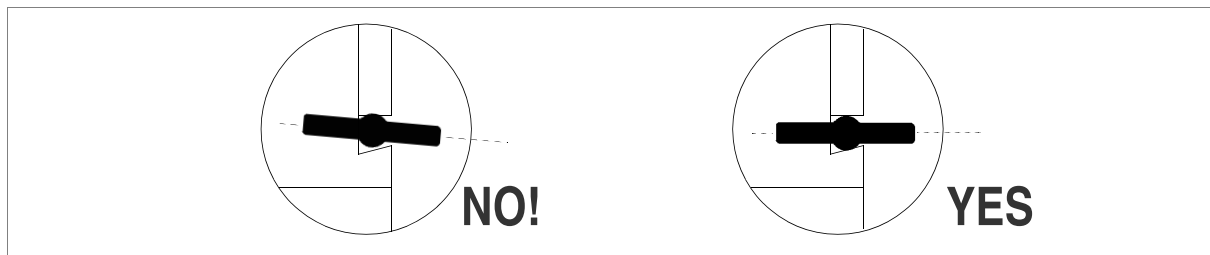


Fig. 39

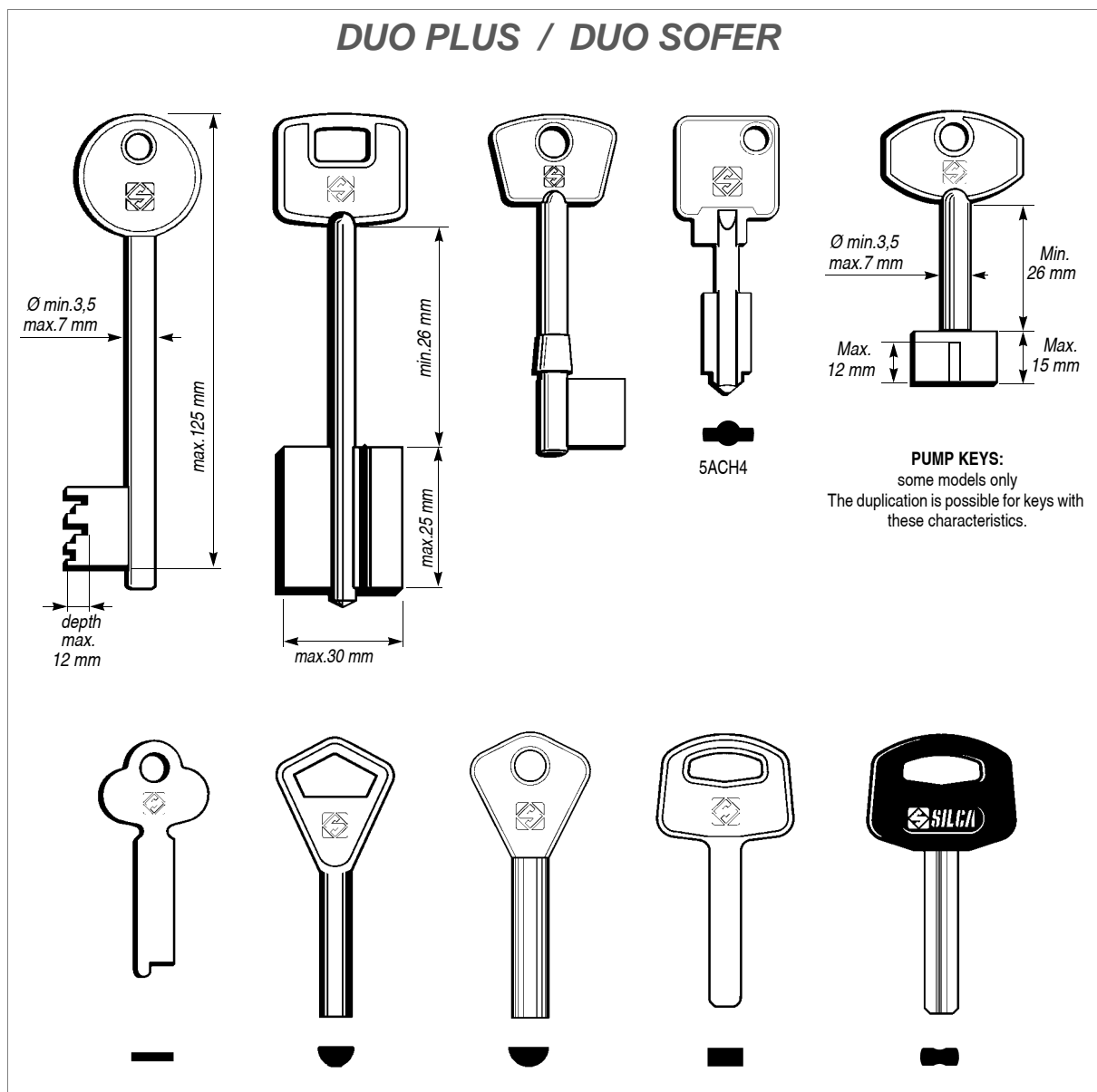


Fig. 40

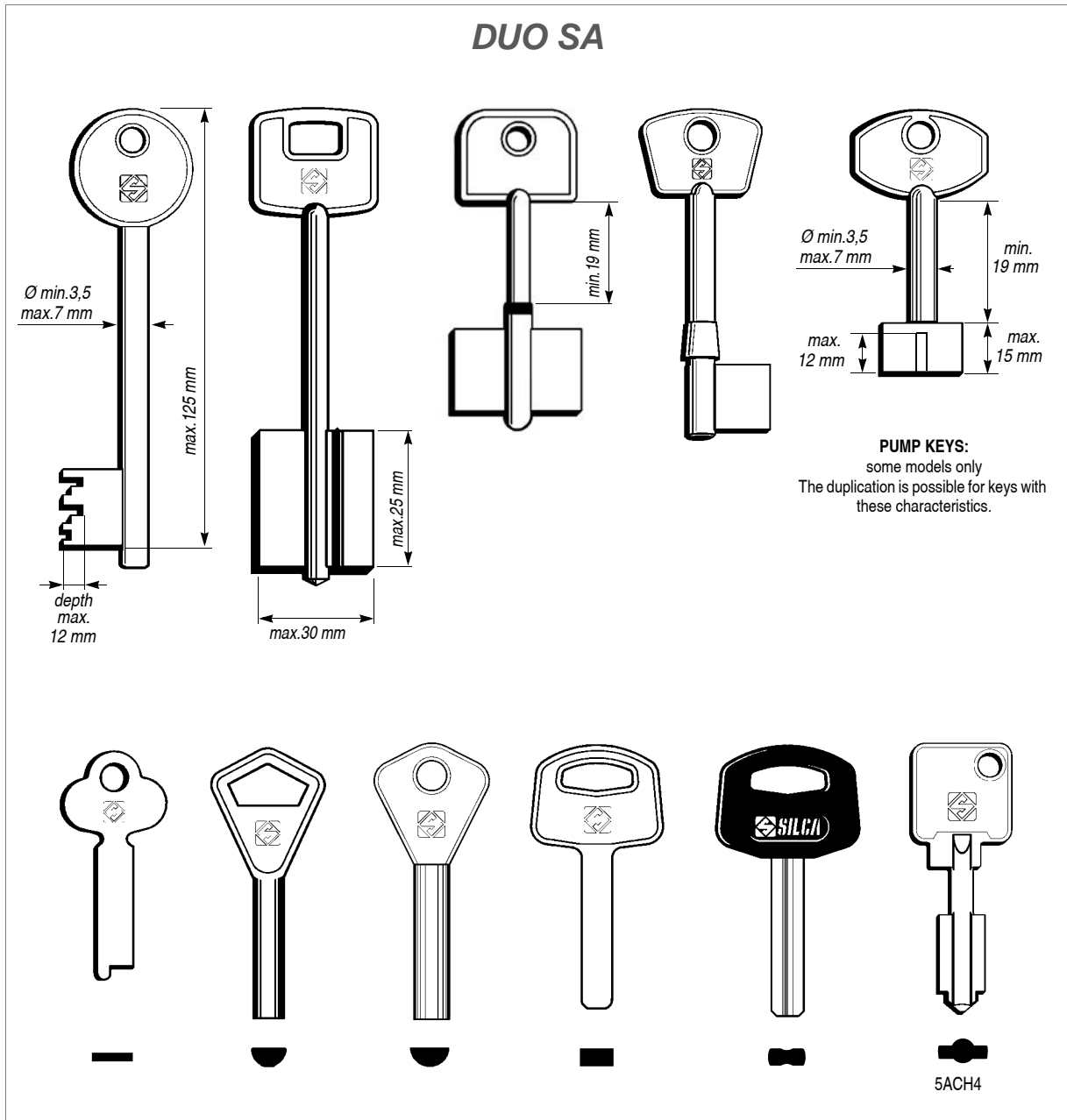


Fig. 41

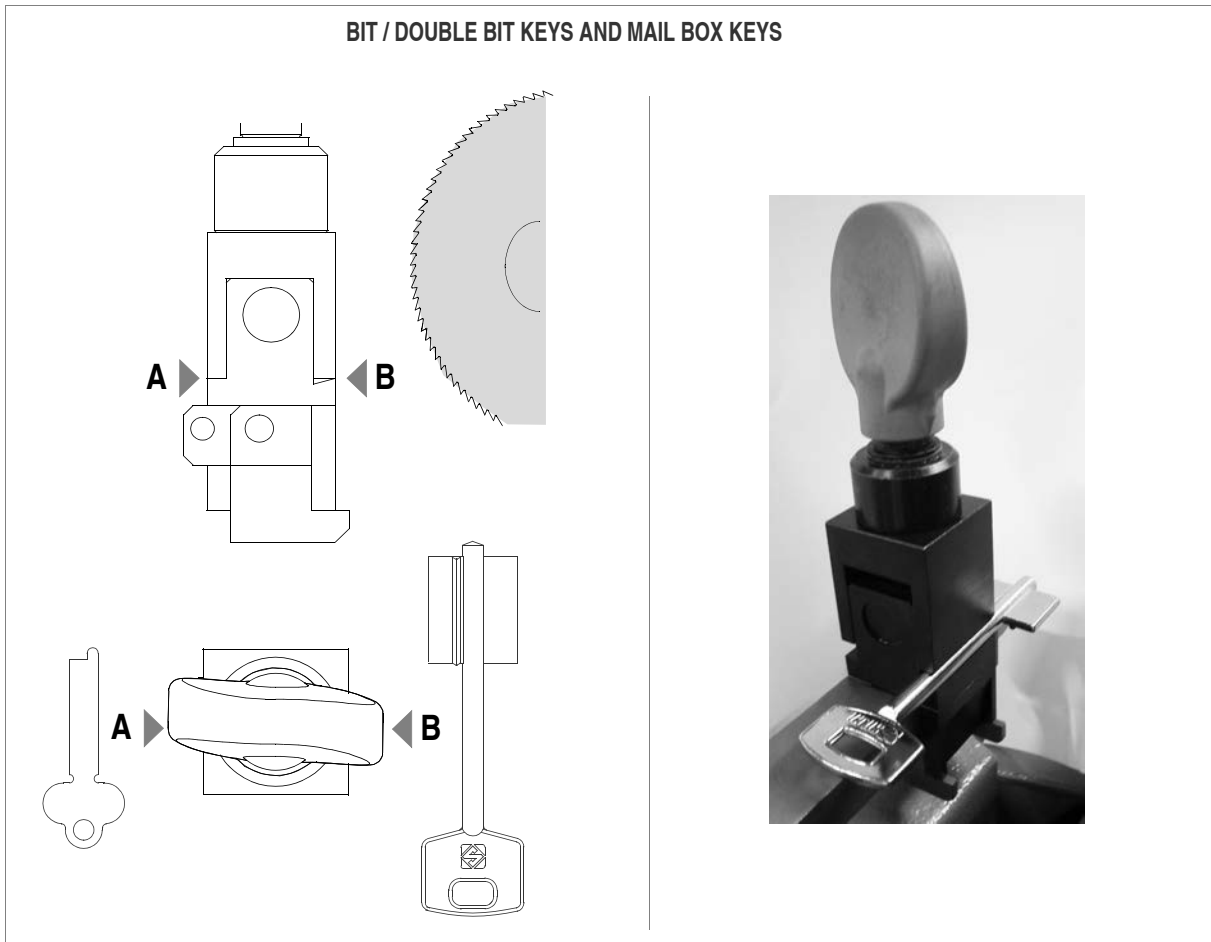


Fig. 42

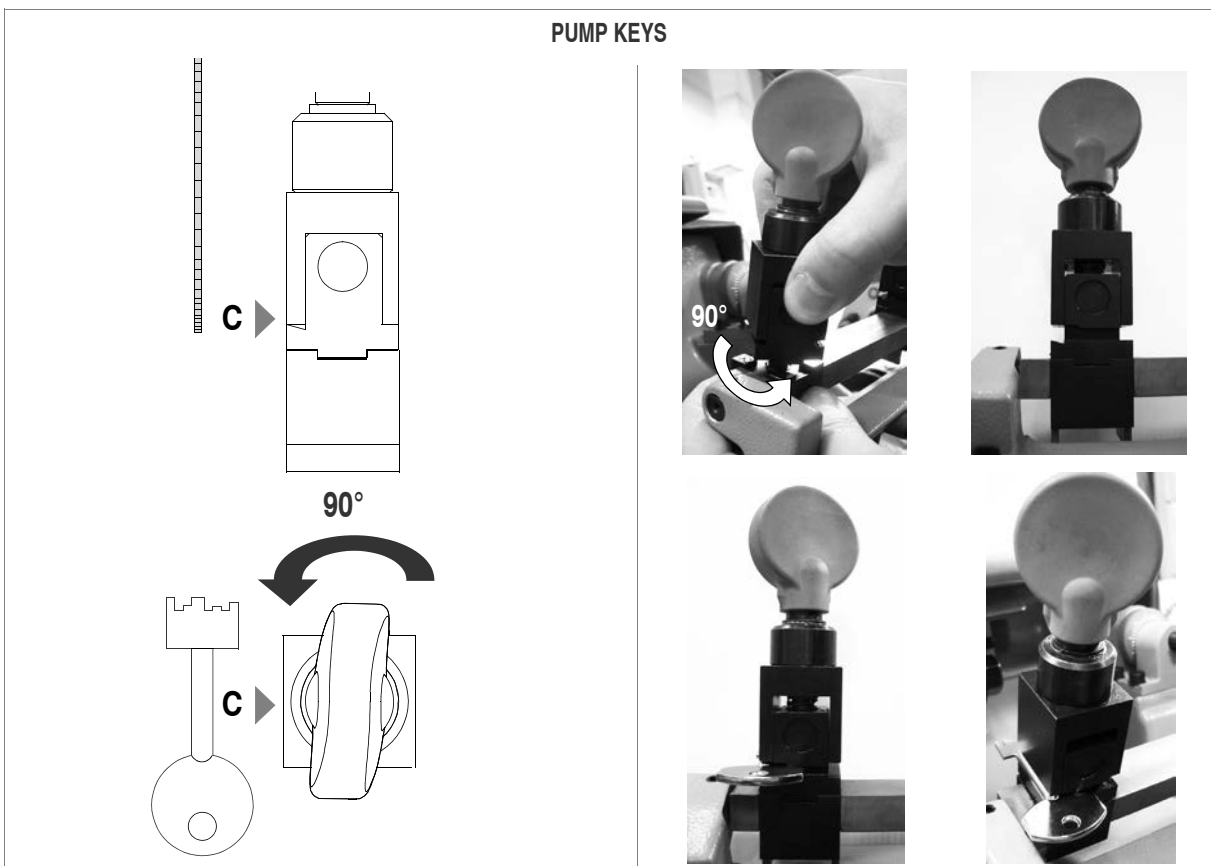


Fig. 43

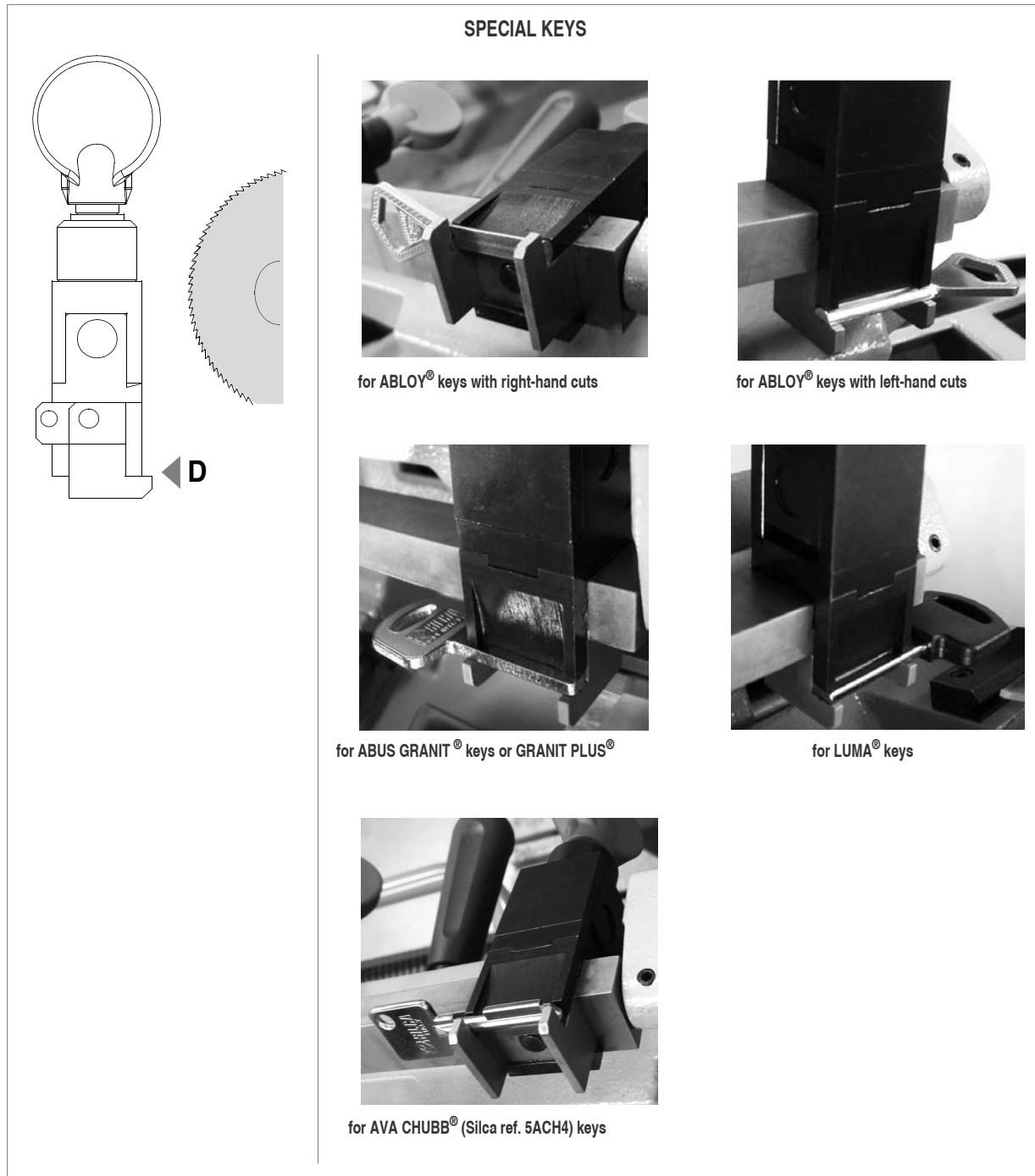


Fig. 44

7.3.1 Cutting bit and double bit keys

- 1) Prepare the clamps with the required side facing the cutter and tracer point (fig. 42).
- 2) Lock the clamps in the horizontal position by means of the pin (L) (chap.7.1.4, page 23).
- 3) Place the key to be cut into the left-hand clamp.

Note: leave clearance at least 2 mm between the bit and clamp.

- 4) Raise the carriage and place the bit against the cutter (fig. 45).
- 5) Secure the original key in the right-hand clamp, placing the bit against the tracer point; this will ensure that the two keys are perfectly aligned.

Note: choose a translation system with fixed or free carriage (chap.7.1.3, page 22).

- 6) Proceed with cutting (fig. 46); if necessary, activate tilting to flare the cuts (chap.7.1.4, page 23).
- 7) Raise the carriage with the handle (H) and take the original key into contact with the tracer point to carry out cutting.
- 8) Take the carriage back with the handle (H), go on to the next cutting position and continue from point 7.
- 9) When cutting is finished, turn off the switch (U) and remove the keys.

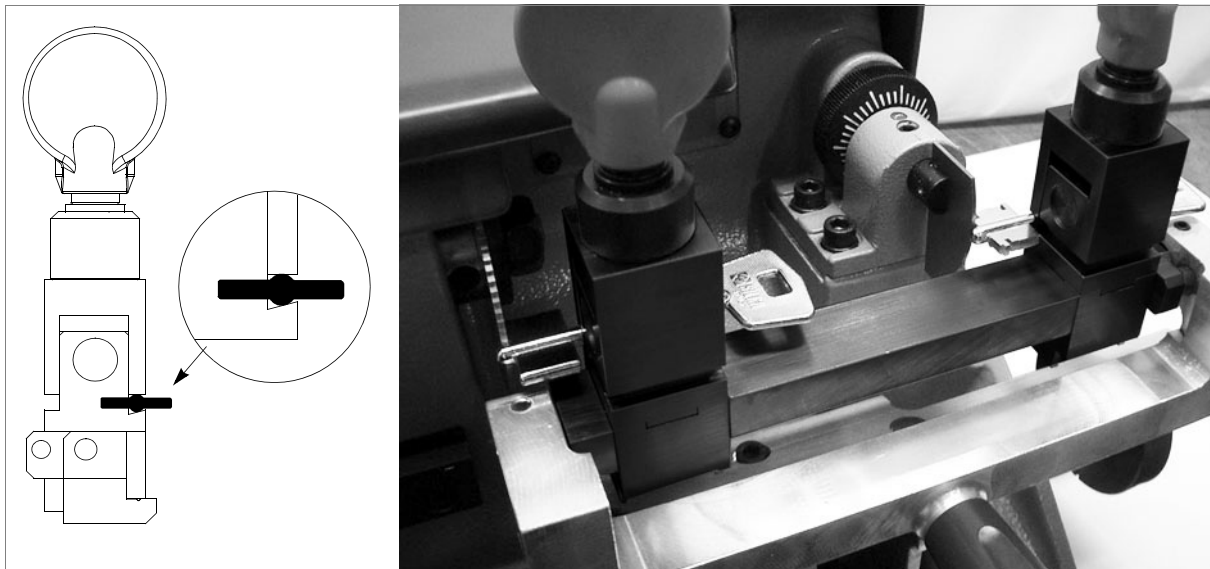
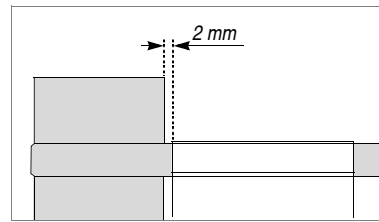


Fig. 45

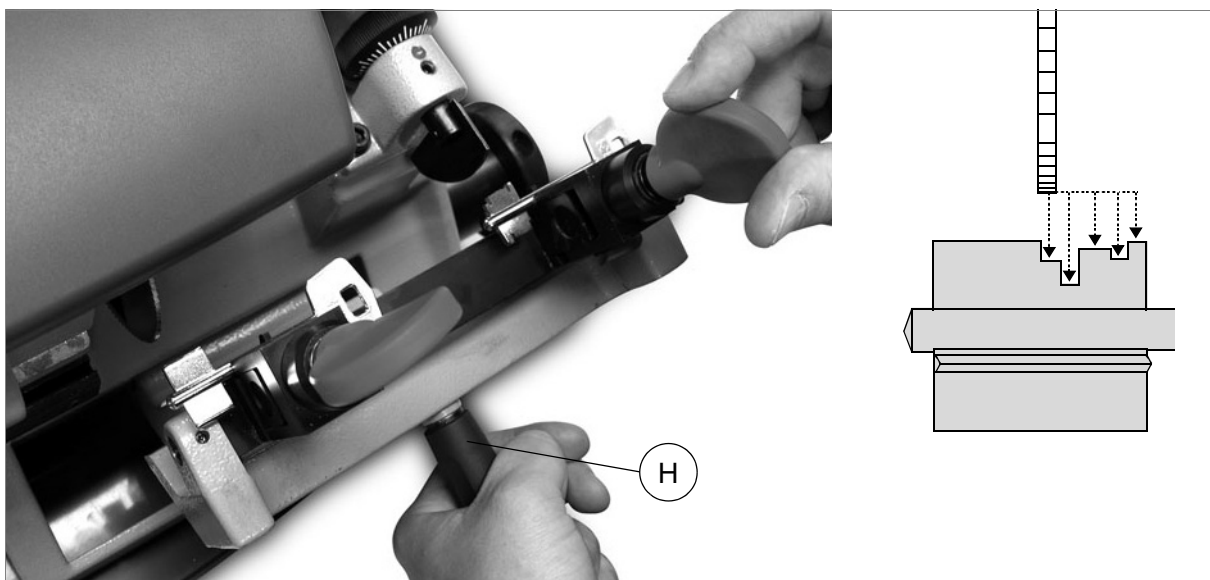


Fig. 46

7.3.1.1 Cutting double bit keys with central stop (Argentina type)

ATTENTION: only with DUO SA

- 1) Prepare the clamps with the required side facing the cutter and tracer point (fig. 42).
- 2) Lock the clamps in the horizontal position by means of the pin (L) (chap.7.1.4, page 23).
- 3) Place the key to be cut into the left-hand clamp.
- 4) Raise the carriage and place the bit against the cutter (fig. 48).
- 5) Secure the original key in the right-hand clamp, placing the bit against the tracer point; this will ensure that the two keys are perfectly aligned.

Nota bene: choose a translation system with fixed or free carriage (chap.7.1.3, page 22).

- 6) Proceed with cutting; if necessary, activate tilting to flare the cuts (chap.7.1.4, page 23).
- 7) Raise the carriage with the handle (H) and take the original key into contact with the tracer point to carry out cutting.
- 8) Take the carriage back with the handle (H), go on to the next cutting position and continue from point 7.
- 9) When cutting is finished, turn off the switch (U) and remove the keys.

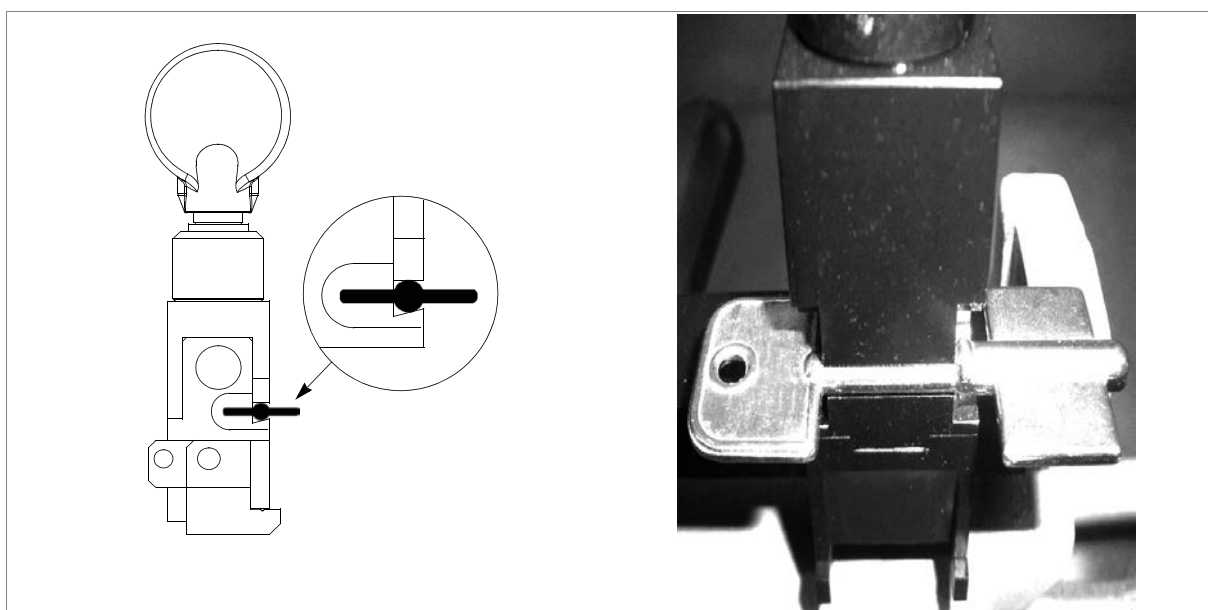


Fig. 47

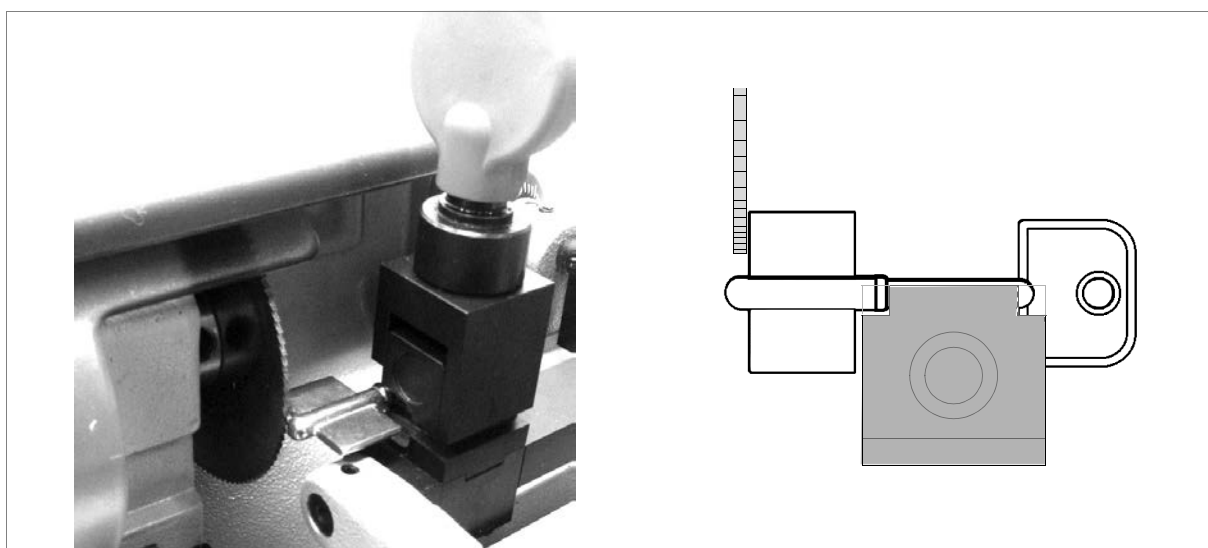


Fig. 48

7.3.2 Cutting keys with central stop

Note: check that the clamps are locked into the fixed position.

- 1) Prepare the clamps with the required side facing the cutter and tracer point.
- 2) Loosen the clamp handles slightly to allow the keys to enter.
- 3) Insert the original key into the right-hand clamp with the central stop up against the clamp (left-hand side) and the bit parallel to the clamp; tighten the knob (K) to secure the key.
- 4) Insert the key to be cut into the left-hand clamp with the central stop up against the clamp (left-hand side) and the bit parallel to the clamp; tighten the knob (K) to secure the key.

Note: choose a translation system with fixed or free carriage (chap.7.1.3, page 22).

- 5) Start the machine and proceed with cutting.
- 6) Raise the carriage with the handle (H) and take the cut key into contact with the tracer point to complete cutting.
- 7) Take the carriage back with the handle (H), go on to the next cutting position and continue from point 6.
- 8) When cutting is finished, turn off the switch (U) and remove the keys.

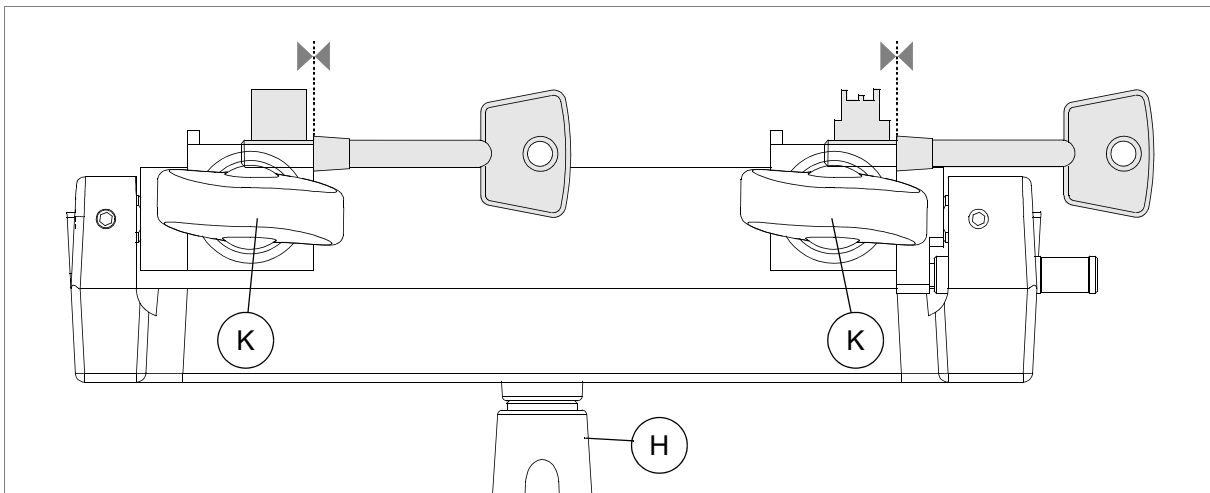


Fig. 49

7.3.3 Cutting mail box keys

Note: check that the clamps are locked into the fixed position.

- 1) Prepare the clamps with the required side facing the cutter and tracer point.
- 2) Loosen the clamp handles slightly to allow the keys to enter.
- 3) Insert the original key into the right-hand clamp, using the end of the bit (towards the tip) as a reference against the tracer point (fig. 51).
- 4) Insert the key to be cut into the left-hand clamp, using the end of the bit (towards the tip) as a reference against the cutter.

Note: choose a translation system with fixed or free carriage (chap.7.1.3, page 22).

- 5) Start the machine and proceed with cutting.
- 6) Raise the carriage with the handle (H) and take the cut key into contact with the tracer point to complete cutting.
- 7) Take the carriage back with the handle (H), go on to the next cutting position and continue from point 6.
- 8) When cutting is finished, turn off the switch (U) and remove the keys.

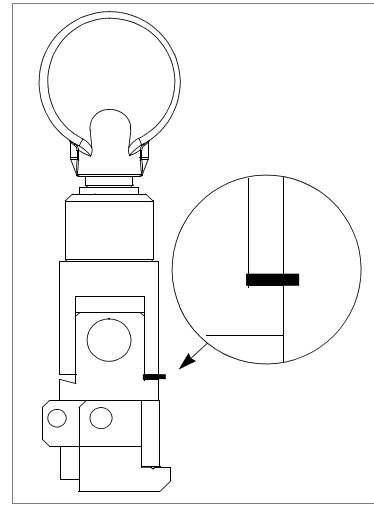


Fig. 50

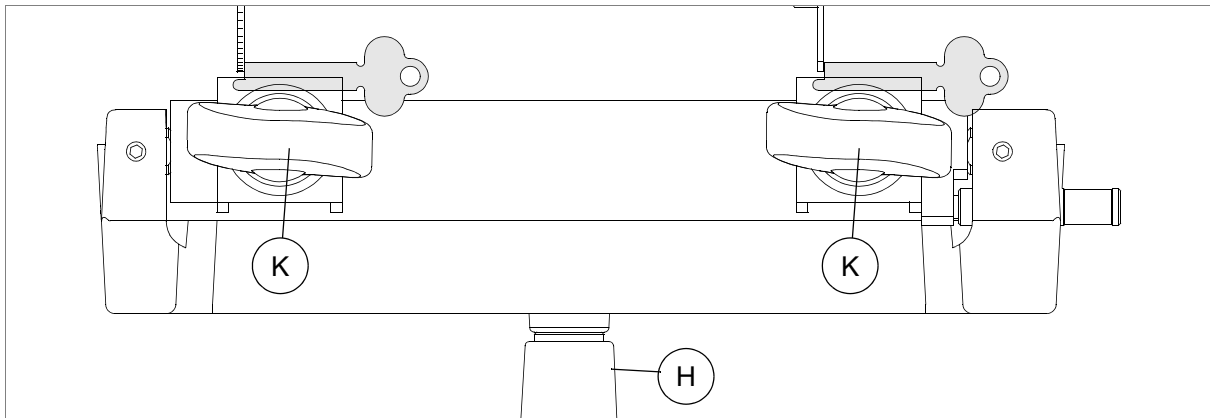


Fig. 51

7.3.4 Cutting pump keys

ATTENTION: some models only (see fig. 53).

- 1) Prepare the clamps with the bit key jaw turned 90° (fig. 52).
- 2) Lock the clamps into the horizontal position by means of the pin (L) (chap.7.1.4, page 23).
- 3) Place the key to be cut into the left-hand clamp.
- 4) Secure the original key in the right-hand clamp.

Note: choose a translation system with fixed or free carriage (chap.7.1.3, page 22).

- 5) Start the machine and proceed with cutting.
- 6) Raise the carriage with the handle (H) and take the cut key into contact with the tracer point to complete cutting.
- 7) Take the carriage back with the handle (H), go on to the next cutting position and continue from point 6.
- 8) When cutting is finished, turn off the switch (U) and remove the keys.

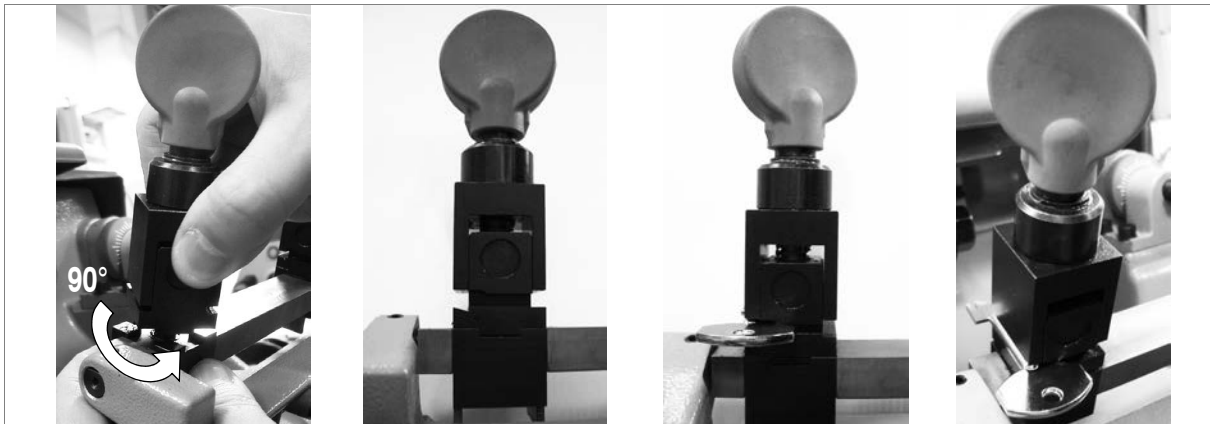


Fig. 52

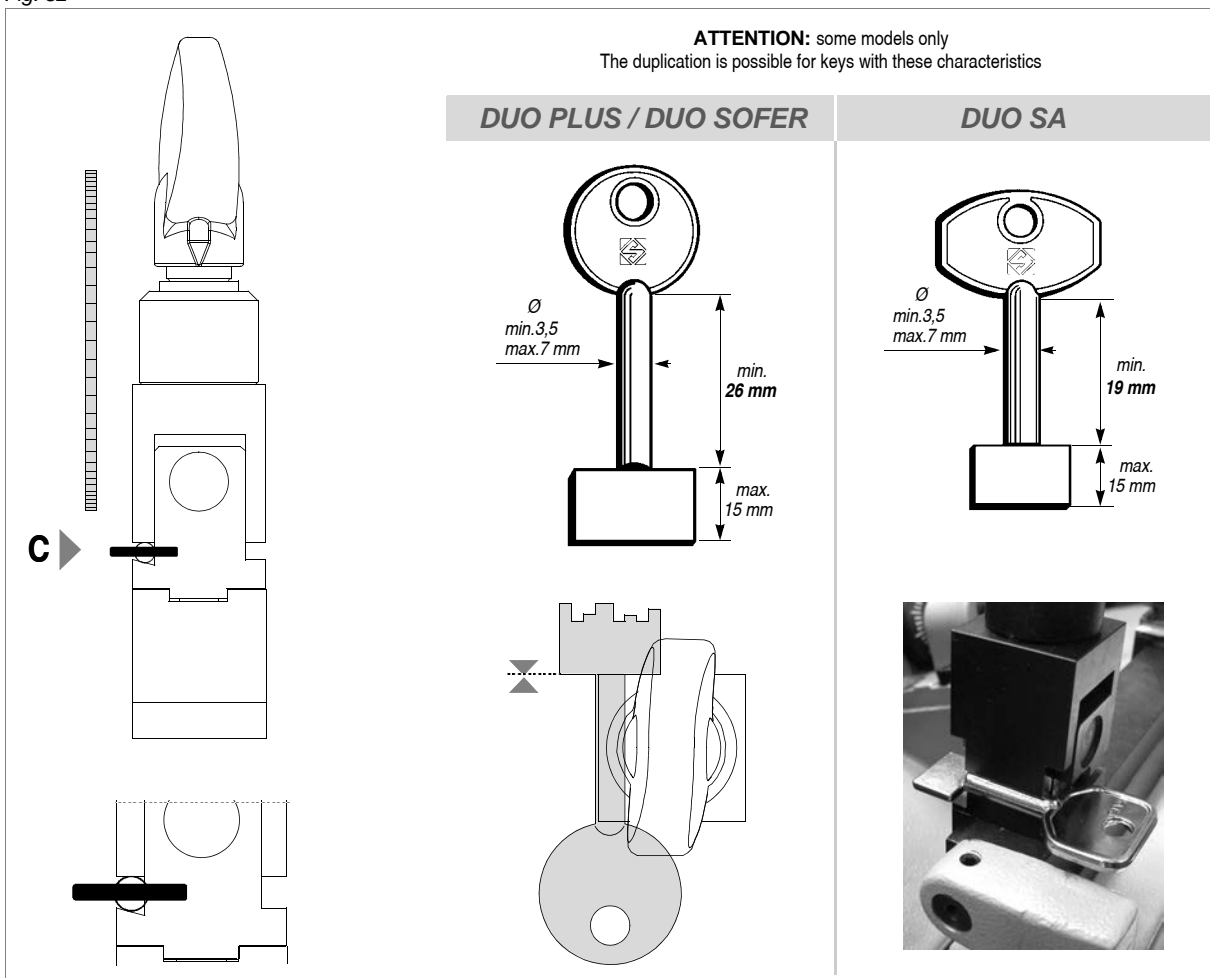


Fig. 53

7.3.5 Cutting special keys such as Abloy®, Abus®, Luma®, Ava Chubb® (Silca ref.5ACH4)

ABLOY® keys (diameter 7.5 or 6 mm)

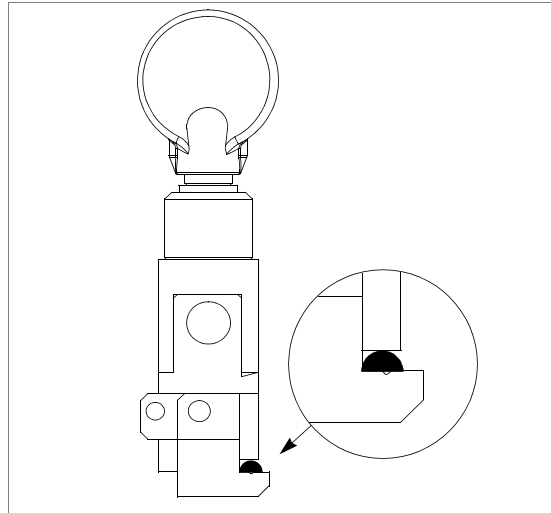


Fig. 54

Loosen the knob (K) in order to raise the lower jaw manually and fit the key. Place the flat part of the key on the bottom plate and fit the back part all the way in.

- **Key with right-hand cuts**

- key head on the **right** of the clamp.
- the flat part of the key downwards.
- the reference for the key relates to the tip, up against the tracer point (original key) and up against the cutter (key blank), or use the stop bar up against the external left-hand side of the clamp (fig. 55).

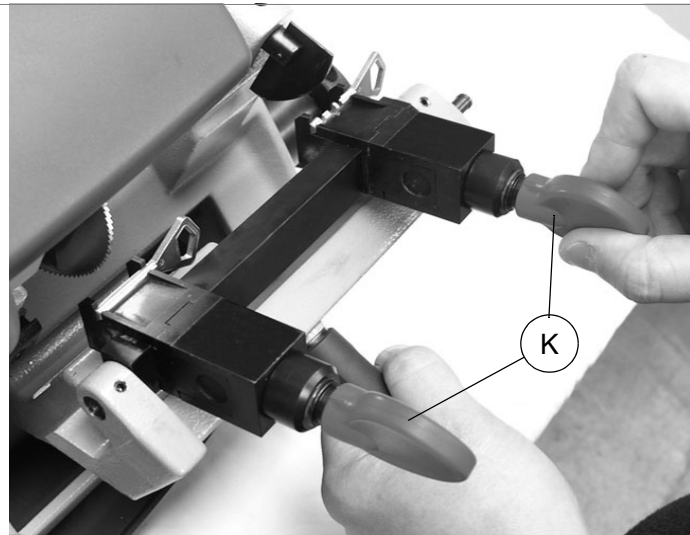
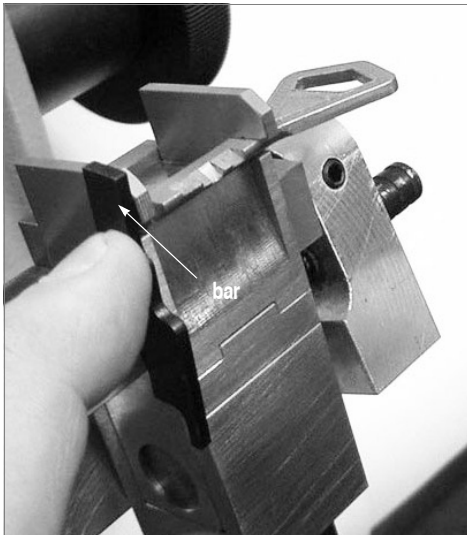
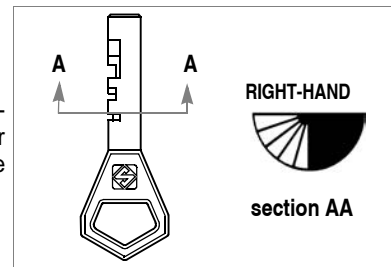
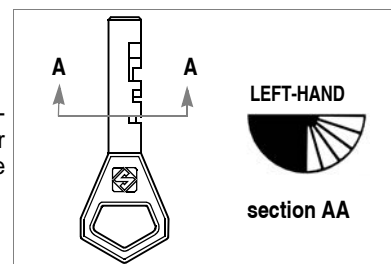


Fig. 55

- **Key with left-hand cuts**

- key head on the **left** of the clamp.
- the flat part of the key downwards.
- the reference for the key relates to the tip, up against the tracer point (original key) and up against the cutter (key blank), or use the stop bar up against the external right-hand side of the clamp.



ABUS® keys (Granit or Granit Plus)

Loosen the knob (K) in order to raise the lower jaw manually (fig. 57) and place the key in position as follows:

- key head on the right of the clamp.
- the wide part of the key downwards up against the bottom plate
- key back up against the rear part.
- the reference for the key relates to the tip, up against the tracer point (original key) and up against the cutter (key blank) or use the stop bar up against the external left-hand side of the clamp (fig. 57).

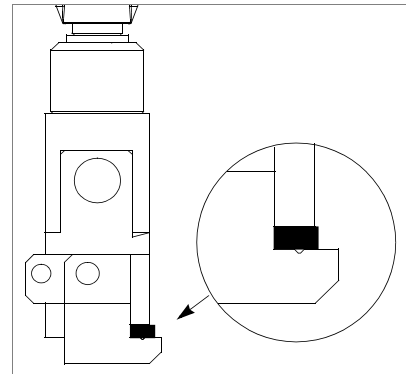


Fig. 56

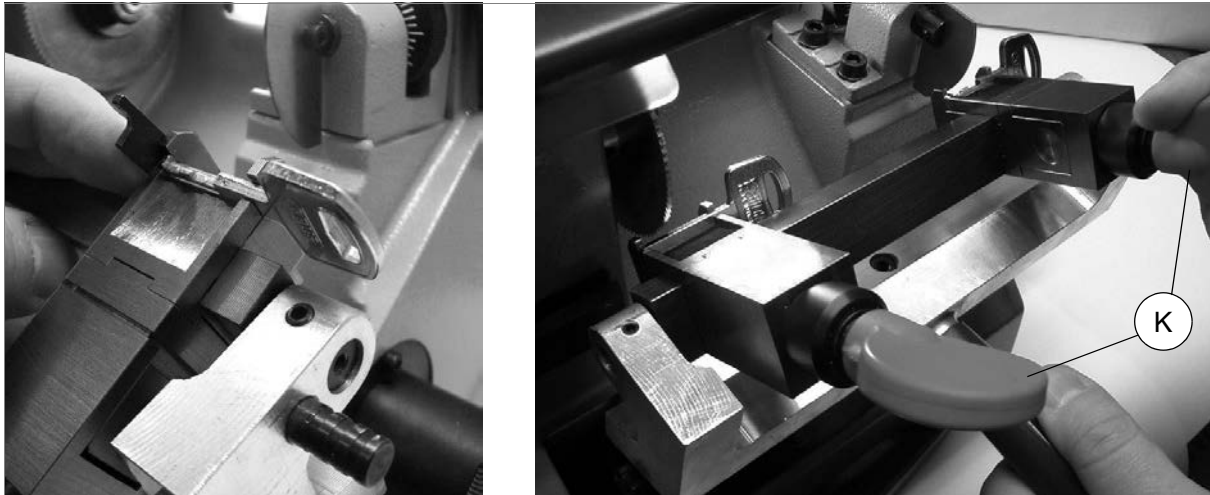


Fig. 57

LUMA® keys

Loosen the knob (K) in order to raise the lower jaw manually and place the key in position as follows:

- the key head on the left of the clamp.
- the wide part of the key downwards on the bottom plate.
- the back up against the rear part.
- the reference for the key relates to the tip, up against the tracer point (original key) and up against the cutter (key blank), or use the stop bar up against the external right-hand side of the clamp (fig. 59).

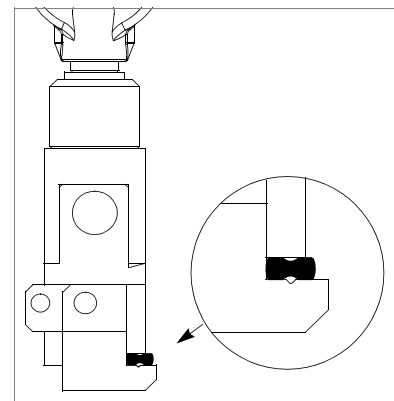


Fig. 58



Fig. 59

AVA CHUBB® keys (Silca ref. 5ACH4)

Loosen the knob (K) in order to raise the lower jaw manually and place the key in position as follows:

- the key head on the right of the clamp.
- the key stem must be centered in the small "V" seat of the lower plan (fig. 60).
- take care that the key bits are aligned and in parallel position (fig.39, page 28).
- the reference for the key relates to the tip, up against the tracer point (original key) and up against the cutter (key blank), or use the stop bar up against the external left-hand side of the clamp (fig. 61).

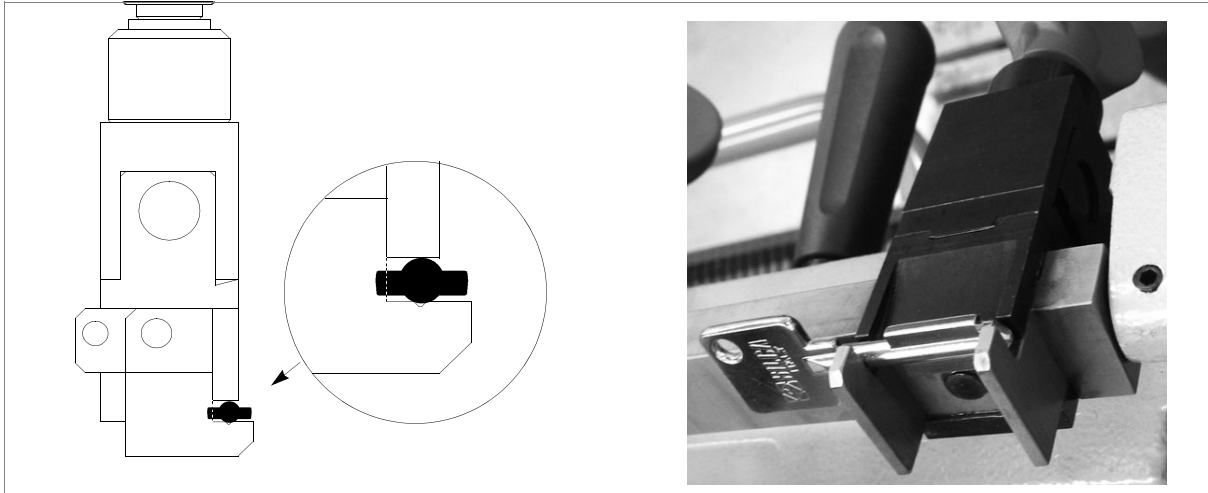


Fig. 60

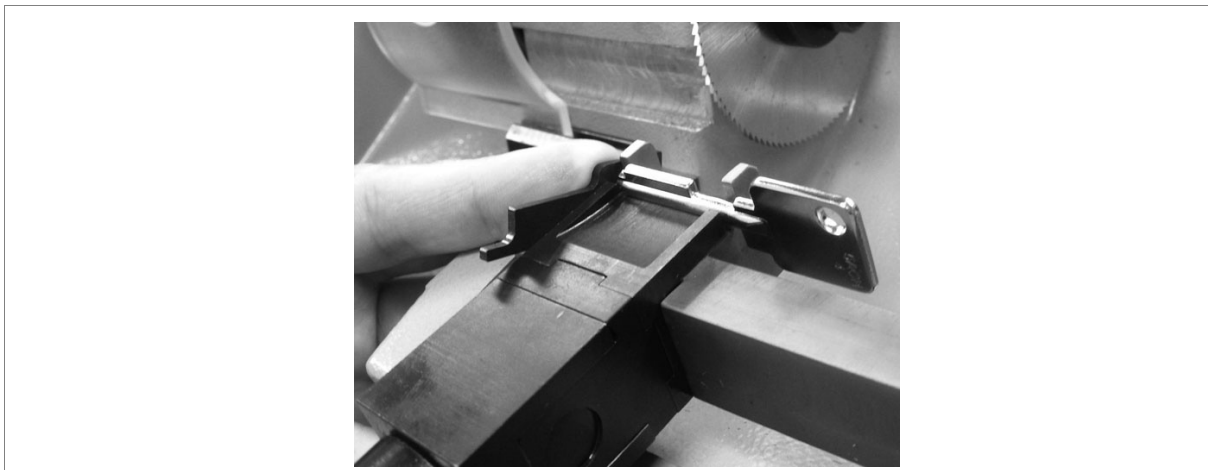


Fig. 61

8 MAINTENANCE

ATTENTION: for repairs or replacement of parts for maintenance, the 'CE' mark is guaranteed only if original spare parts provided by the manufacturer are used.

Although the key-cutting machine does not require special maintenance, it is advisable to check and, if necessary, replace the parts subject to wear, such as: the belt, cutting tool, brush, tracer point. Replacement is simple and can be carried out by the operator.

CLEANING

Keep the carriage and clamps free of chippings from the cutting operations by cleaning with a dry brush.

ATTENTION: do not use compressed air!

ATTENTION: to keep the machine well maintained we recommend using protective oil, e.g. WD40 or similar, applied to the burnished mechanical parts. This prevents oxidation of the parts in question (clamps, guides, carriages, etc.).

Before starting any type of maintenance (checks or replacements), read the instructions below:

- never carry out maintenance or servicing with the machine switched on.
- always remove the mains plug.
- follow all the instructions in the manual to the letter.
- use original spare parts.
- always check that any screws or nuts removed when replacing a piece are properly tightened.

8.1 Replacing the cutting tool

In order to substitute the cutting tool you don't need to remove the cutting tool cover. To replace a worn cutting tool, proceed as follows:

ATTENTION: remove the mains plug.

- 1) Move the shield (W) to operate on the cutting tool to replace.
- 2) Slot the locking rod (standard) into the hole of the cutting tool shaft (fig. 62).
- 3) Use the spanner provided to loosen the cutting tool locking the nut.

ATTENTION: the thread is:

- left-handed for prismatic cutters (flat keys)
 - right-handed for saw cutters (bit, pump keys)
- 4) Remove the worn cutting tool.
 - 5) Carefully clean the new cutting tool and its seat
 - 6) Install the new cutting tool and tighten the nut.

ATTENTION: the direction of cutter rotation is: clockwise for prismatic cutters, anticlockwise for saw cutters.

- 7) Remove the locking pin.



Fig. 62

8.2 Access to the lower part

ATTENTION: remove the mains plug.

- 1) Detach the wire from the key-cutting machine socket.
- 2) Remove the swarf tray (S) (fig.6, page 8).
- 3) Before to turn the machine onto its back take the carriages externally to the end of run (left-hand carriage all to the left, right-hand carriage all to the right) to avoid contacts between cutter/tracer point and clamps during movement.
- 4) Turn the machine onto its back firmly holding it on handles (C and H) (fig. 63).

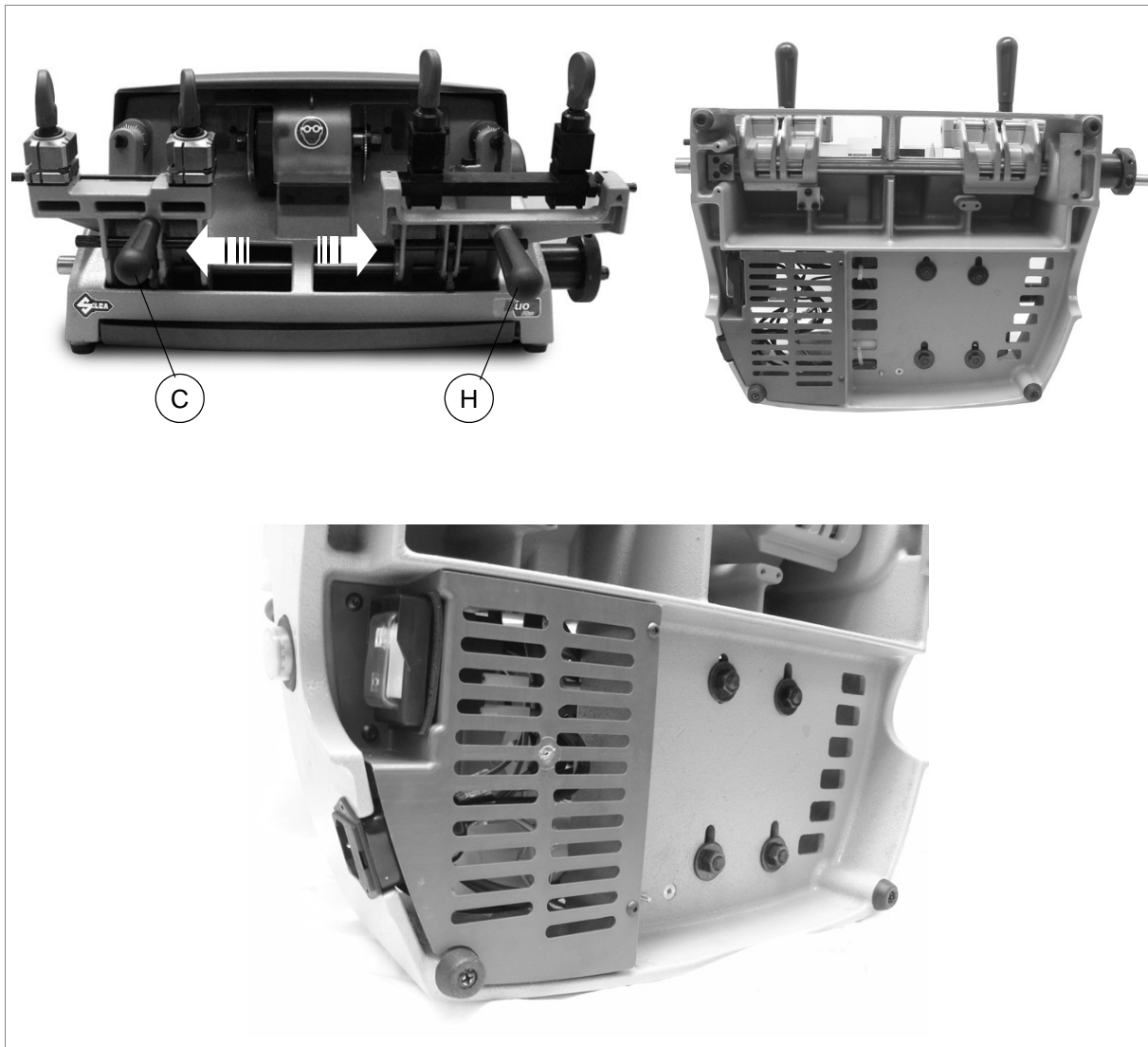


Fig. 63

8.3 Replacing the brush

When the brush no longer cleans off the burrs it must be replaced as follows.

ATTENTION: remove the mains plug.

- 1) Place the locking rod (provided) in position on the motor shaft.
- 2) Use the Allen wrench (provided) to loosen the screw holding the brush in place (fig. 64).
- 3) Replace the brush and tighten the screw with the Allen wrench.
- 4) Remove the locking rod from the motor shaft.

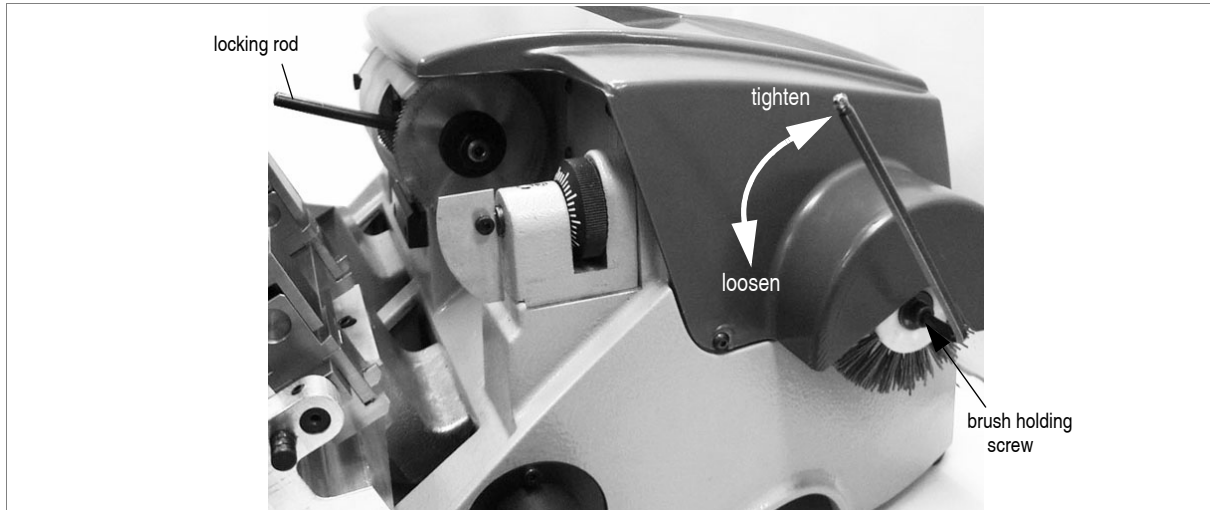


Fig. 64

8.4 Replacing and/or tightening the belt

Worn or loose belts must be replaced or adjusted so as to ensure safe and proper operation of the cutting tool/ brush.

Tension:

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover(Q) (fig. 65).
- 2) Access the bottom part (chap.8.2, page 41) and loosen the 4 nuts (S1) of the plate motor (fig. 66).
- 3) Push the motor back until the belt is properly tightened.
- 4) Tighten the four nuts (S1).
- 5) Place the machine in position on the work bench.

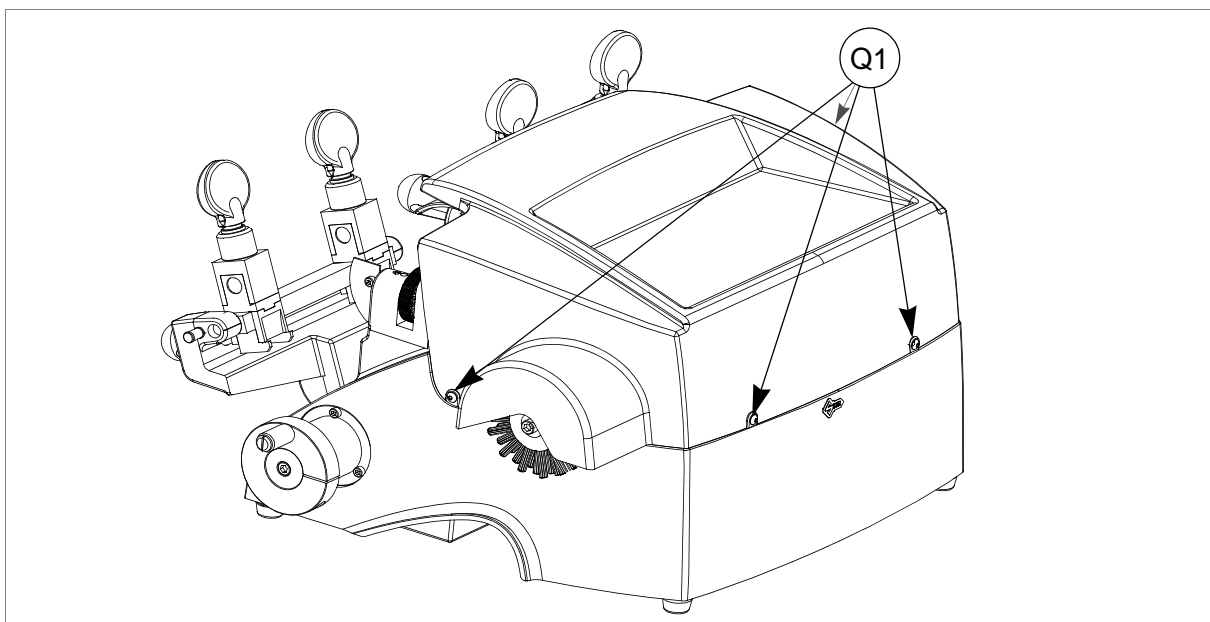


Fig. 65

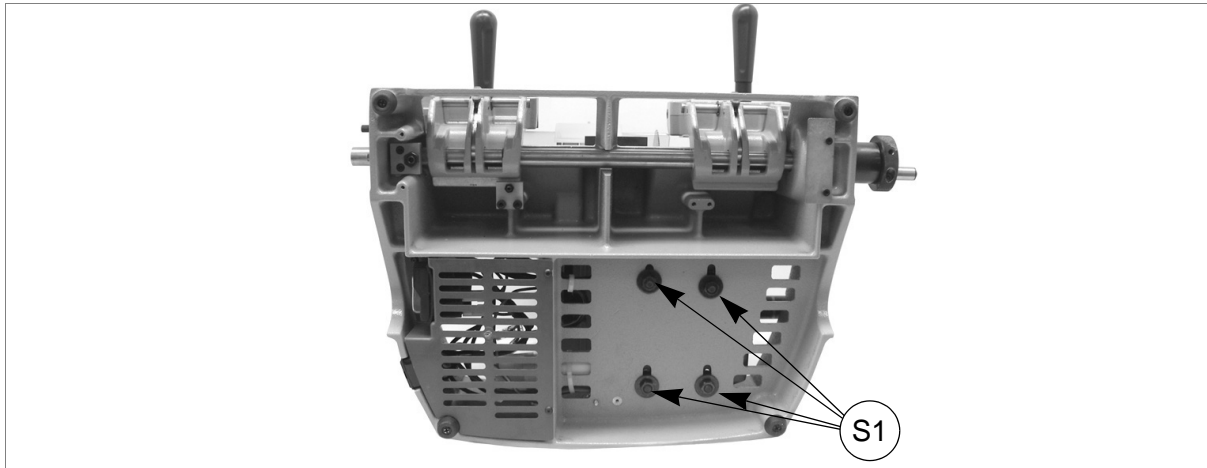


Fig. 66

Belt replacement:

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q) (fig. 65).
- 2) Remove the fan and remove the old belt, turning the main pulley manually and exerting a little pressure on the belt to prize it out of its seat.
- 3) Fit the new belt by inserting it into the motor pulley then (exert a little pressure) into the main pulley, turning it manually.
- 4) Replace the fan and the top cover.

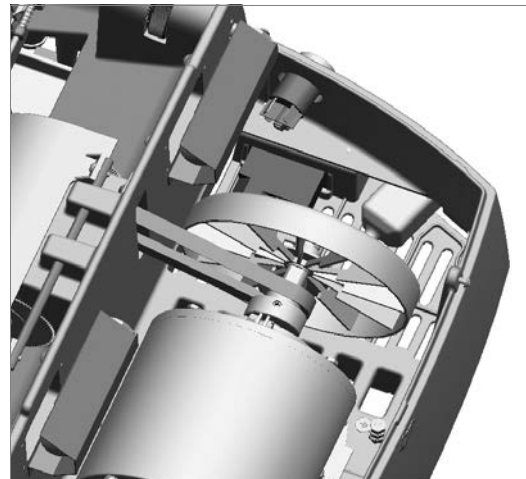


Fig. 67

8.5 Replacing the tracer point

Left-hand tracer point:

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q) (fig.65, page 42).
- 2) Loosen the screw (G4) (fig. 68).
- 3) Loosen the grub screw (G3).
- 4) Loosen the tracer point by turning it anticlockwise until is fully released.
- 5) Fit the new tracer point and screw down to the end of run.
- 6) Tighten the grub screw (G3).
- 7) Tighten the screw (G4).
- 8) Re-set the machine as described in chap. 6.2, page 17.

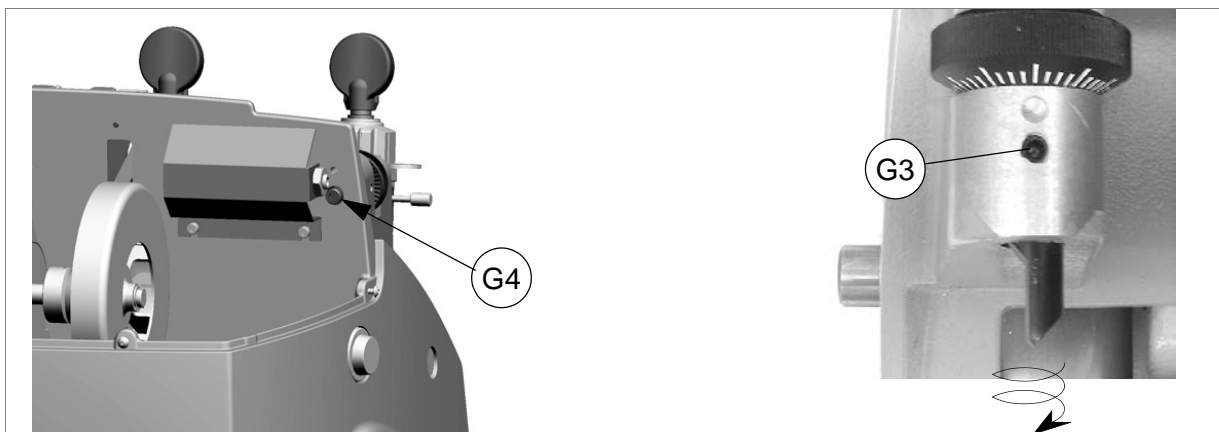


Fig. 68

Right-hand tracer point:**ATTENTION: remove the mains plug.**

- 1) Loosen the screw (N4).
- 2) Remove the worn tracer point (N).
- 3) Fit the new tracer point, pushing all the way in. Ensure that the seat is clean.
- 4) Tighten the screw (N4).
- 5) Re-calibrate the machine, following the procedure described in chap. 6.3, page 19.

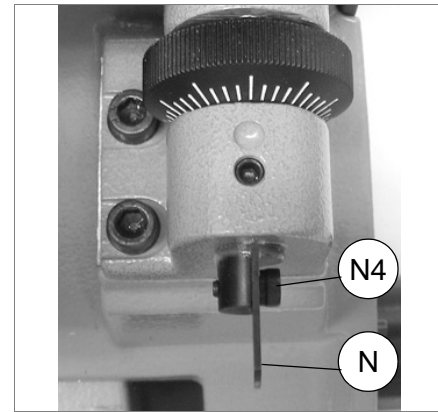


Fig. 69

8.6 Regulating left carriage depth

The carriage on the machine can be regulated to protect the clamps from coming into contact with the tracer point or cutting tool.

ATTENTION: the play between cutting tool or tracer point and clamps must be at least 0.1mm.

Should it be different from this, proceed as follows:

ATTENTION: remove the mains plug.

- 1) Release the carriage, raise against the cutting tool and take to the end of its run (fig. 70)
- 2) Remove the chippings tray (S).
- 3) Release the nut (S3) (fig. 70) with the spanner.
- 4) Use the Allen wrench to screw or unscrew the grub screw in order to move the carriage away from or towards the tracer point and cutting tool.
- 5) Tighten the nut.

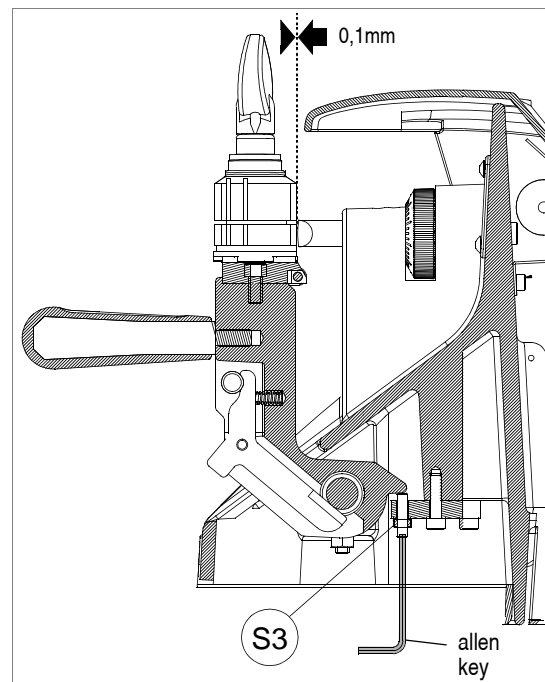


Fig. 70

8.7 Replacing the fuses**ATTENTION: remove the mains plug.**

- 1) Unplug the power cable from the key-cutting machine socket
- 2) Remove the fuses box placed below the key-cutting machine socket (V) (fig. 71).
- 3) Replace the fuses (V1) (fig. 71).
- 4) Close the fuses box and connect the power cable

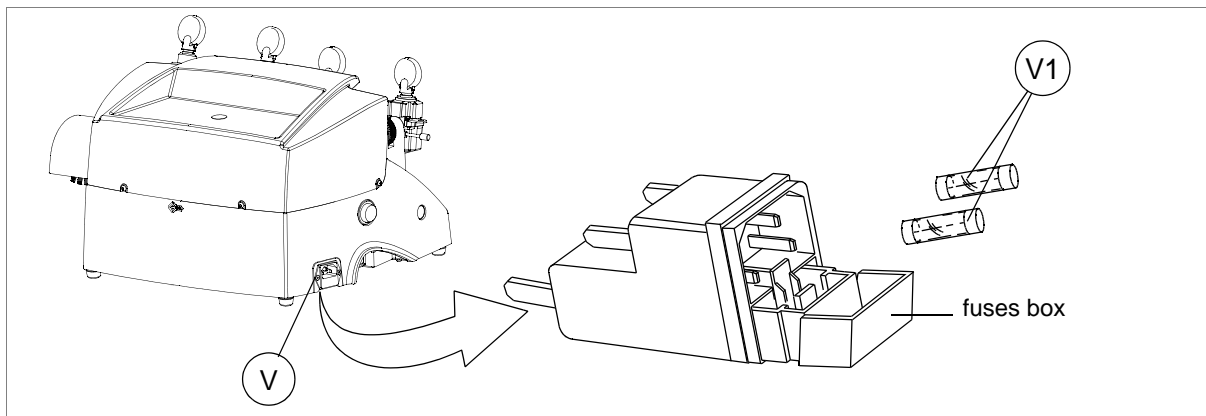
ATTENTION: fuses must always be replaced with others of the same type (rapid) and with the same Amps (4 Amp for 230V - 8 Amp for 120V).

Fig. 71

8.8 Replacing main switch

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q) (fig.65, page 42).
- 2) Detach the 4 connectors (V2) paying special attention to their position.
- 3) Remove the switch making pressure on the tabs with a screwdriver.
- 4) Fit the new main switch.
- 5) Reconnect the 4 connectors (V2).
- 6) Replace the top cover and secure with the 4 screws (Q1).

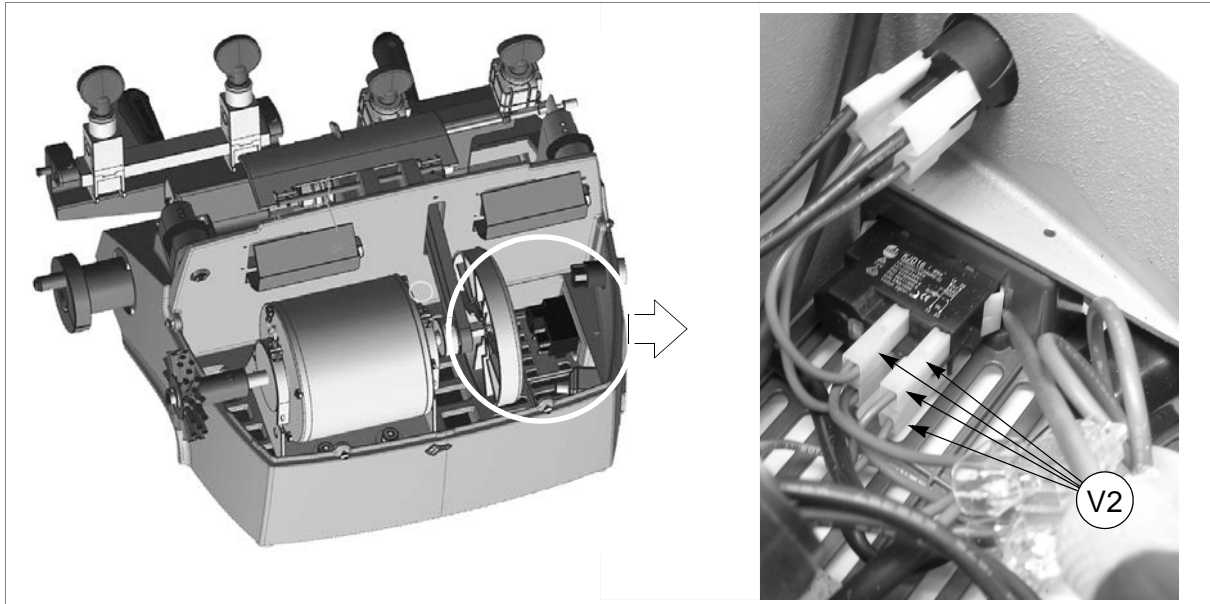


Fig. 72



Fig. 73

8.9 Replacing motor on switch

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q) (fig.65, page 42).
- 2) Detach the 4 connectors (S2) (fig. 74) paying special attention to their position.
- 3) Use a screwdriver to turn down the internal switch fixing tabs and pull it out.
- 4) Fit the new switch in its seat and reconnect the 4 connectors (S2) paying special attention to their position.
- 5) Replace the top cover and secure with the 4 screws (Q1).

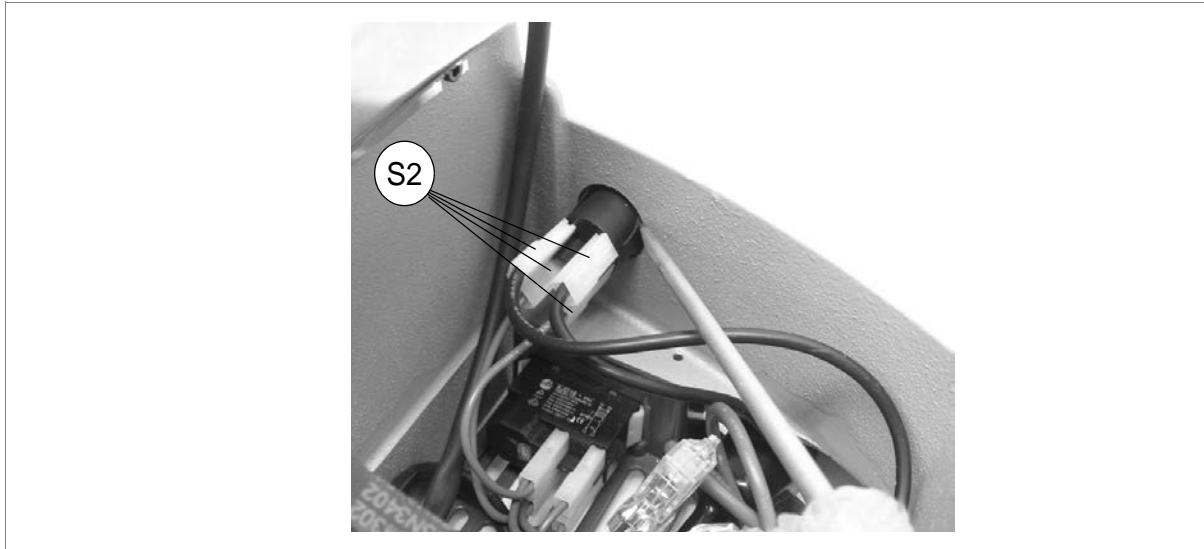


Fig. 74

8.10 Replacing motor/condenser

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q).
- 2) Detach the 4 connectors (S2) from the motor ignition switch and condenser (fig.74, page 46).
- 3) Unscrew the earth cable nut (S5) (fig. 75).
- 4) Turn the machine onto its back (chap.8.2, page 41).
- 5) Loosen the 4 screws (S1) (fig. 76) on the motor fixing plate and remove the belt (chap.8.4, page 42).
- 6) Loosen completely only the 2 lower screws (S1) the motor fixing plate and pull downwards.
- 7) Install the new motor and tighten the 4 screws (S1) slightly.
- 8) Place the machine in position on the work bench.
- 9) Install the belt and tighten it, and tighten the 4 screws (S1) (fig. 76) of the plate motor.
- 10) Connect the 4 connectors (S2) (fig. 74) to the motor on switch and fit the earth cable to its screw with the nut (S5) (fig. 75).
- 11) Replace the condenser wires.
- 12) Replace the top cover and secure with the 4 screws (Q1).

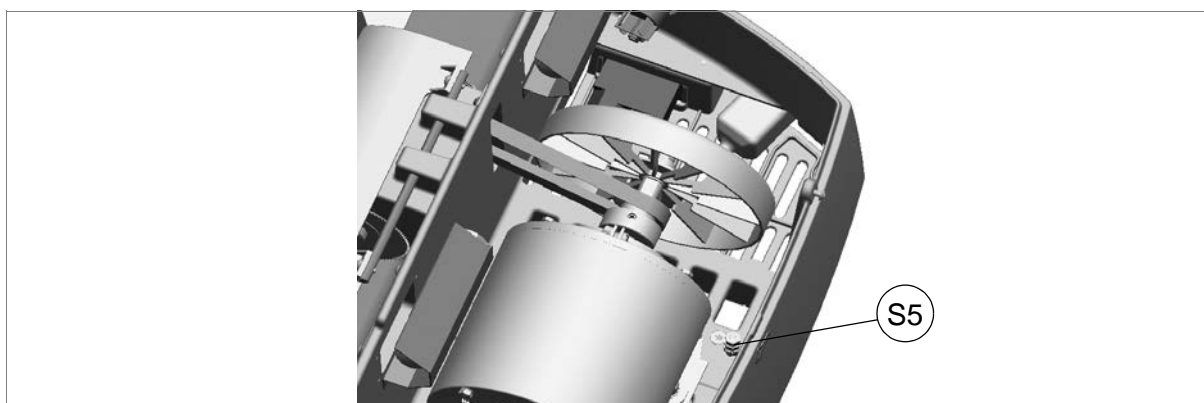


Fig. 75

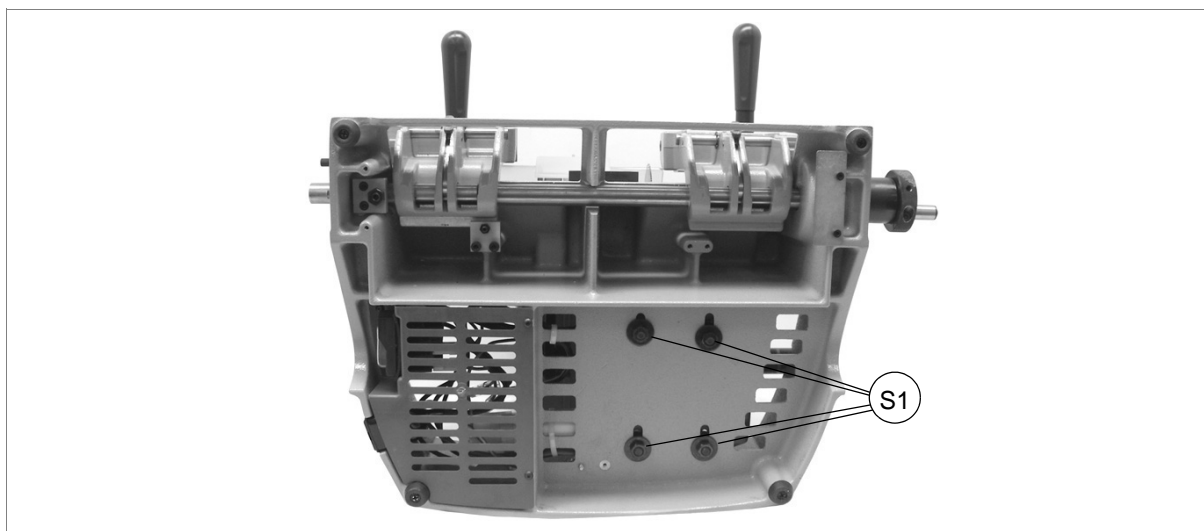


Fig. 76

8.11 Replacing lamp

ATTENTION: remove the mains plug.

- 1) Loosen the 4 screws (Q1) and remove the top cover (Q).
- 2) Loosen the light bulb (this may be facilitated by removing the shield (R1) or (R2)).
- 3) Screw the new light bulb into the lamp.
- 4) Replace the top cover and secure with the 4 screws (Q1).

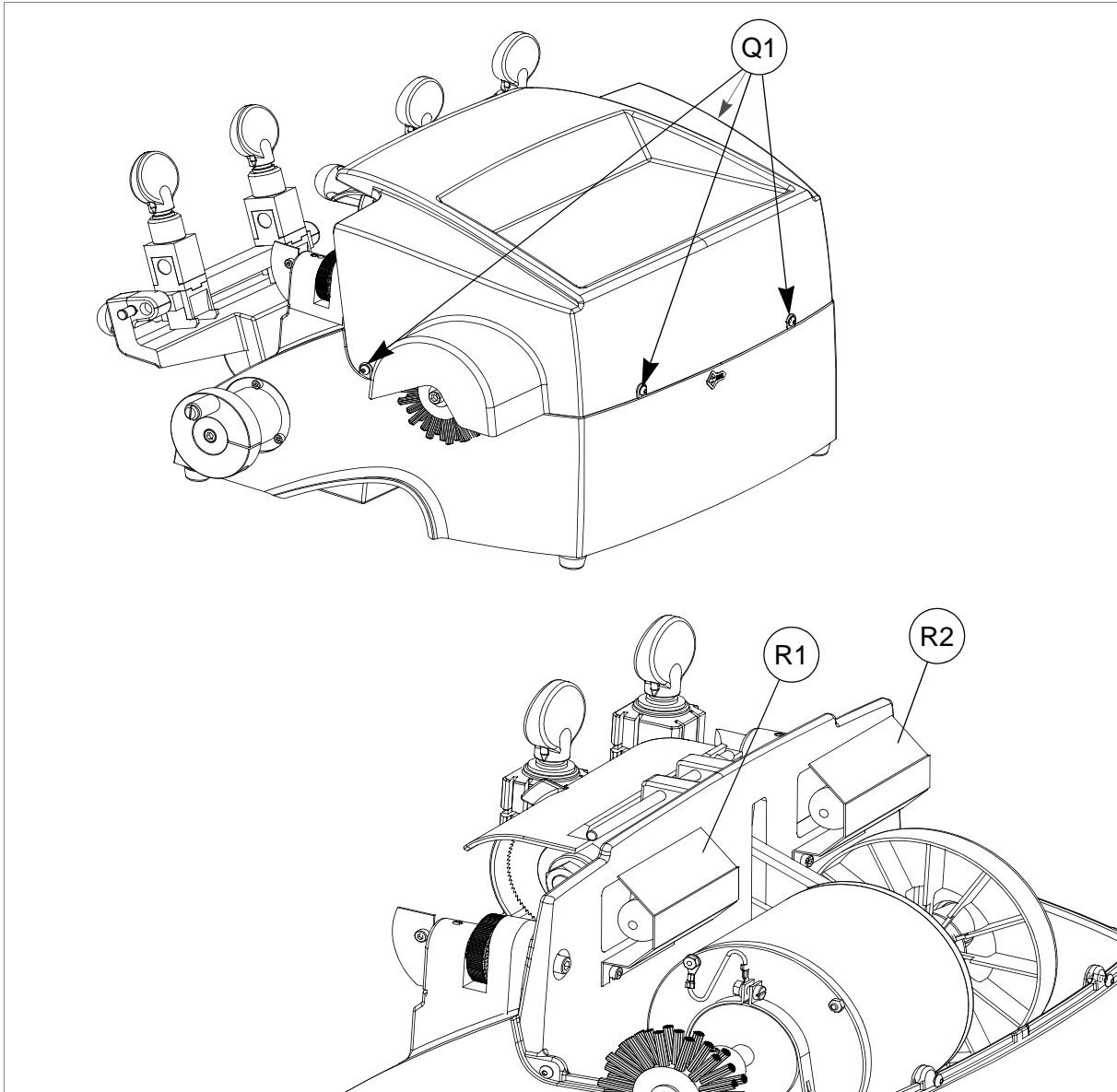


Fig. 77

9 DISPOSAL

For correct disposal please refer to current standards.

INFORMATION FOR USERS OF PROFESSIONAL EQUIPMENT



From "Actuation of Directive 2012/19/EU regarding Waste Electrical and Electronic Equipment (WEEE)"

The symbol of a crossed waste bin found on equipment or its packing indicates that at the end of the product's useful life it must be collected separately from other waste so that it can be properly treated and recycled.

In particular, separate collection of this professional equipment when no longer in use is organised and managed:

- a) directly by the user when the equipment was placed on the market before 31 December 2010 and the user personally decides to eliminate it without replacing it with new equivalent equipment designed for the same use;
- b) by the manufacturer, that is to say the subject which was the first to introduce and market new equipment that replaces previous equipment, when the user decides to eliminate equipment placed on the market before 31 December 2010 at the end of its useful life and replace it with an equivalent product designed for the same use. In this latter case the user may ask the manufacturer to collect the existing equipment;
- c) by the manufacturer, that is to say the subject which was the first to introduce and market new equipment that replaces previous equipment, if it was placed on the market after 31 December 2010;

Suitable separate collection for the purpose of forwarding discarded equipment for recycling, treatment or disposal in an environmentally friendly way helps to avoid possible negative effects on the environment and human health and encourages re-use and/or recycling of the materials making up the equipment.

The sanctions currently provided for by law shall apply to users who dispose of products in unauthorised ways.

10 ASSISTANCE

Silca provides full assistance to purchasers of the key-cutting machine.

To ensure complete safety for the operator, any job not specified in this manual should be carried out by the manufacturer or in the special Service Centres recommended by Silca.

At the end of the manual there is a list of authorized Service Centre addresses; if the manual was downloaded is necessary visit the website to see the contacts (www.silca.biz).

Silca undertakes to make consumables, optional items and spare parts available for the limited time defined in its product obsolescence policy.

10.1 How to request service

The guarantee attached to the key-cutting machines ensures free repairs or replacements of faulty parts within 24 months of purchase. All other service calls must be arranged by the customer with Silca or with a Silca service centre.



VITTORIO VENETO 24/03/2011

CE DECLARATION OF MACHINE COMPLIANCE

**SILCA S.p.A. - VIA PODGORA 20 (Z.I.)
31029 VITTORIO VENETO (TV) - (ITALY)
TEL. 0438 9136 - FAX. 0438 913800**

Declares under its own responsibility that the **Key-cutting machine** model

DUO

complies with the requirements of the following European Directives:

European Union **DIRECTIVE 2006/42/CE** (Machines)

and with the EN ISO 12100 – 1 : 2003
EN ISO 12100 – 2 : 2003
EN ISO 14121 – 1 : 2007 Standards

European Union **DIRECTIVE 2004/108/CE** (Electromagnetic Compatibility)

and with the EN 61000 – 6 – 3
EN 61000 - 6 – 1 Standards

European Union **DIRECTIVE 2006/95/CE** (Low Voltage)

and with the EN 60204-1 : 2006 Standards

| 09 |

Claudio Tomasella of the Silca S.p.A. Research & Development Division is authorized to create a Technical File.

General Manager Basic Production Center

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Società soggetta a direzione e coordinamento di Kaba Holding AG, con sede in Rümlang (Svizzera), Hofwisenstrasse 24, ai sensi e per gli effetti degli articoli 2497 - 2497sexies del Codice Civile.

