

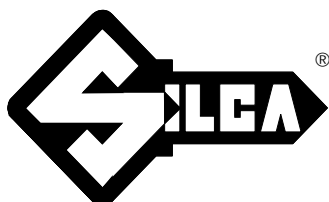
# **DELTA 2000**

## **FO**

Operating manual

**D424556XA**

vers. **2.0**



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## GUIDE TO THE MANUAL

This manual has been produced to serve as a guide for users of the DELTA 2000 FO key-cutting machine. 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 the machine .....	Ch.	5-6
- Maintenance .....	Ch.	7

### 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.

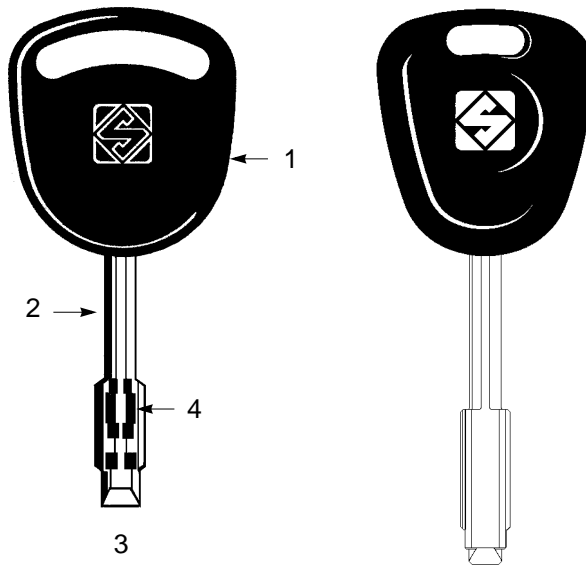


Fig. 1

- 1) Head
- 2) Stem
- 3) Tip
- 4) Cuts

## GENERAL INSTRUCTIONS

The DELTA 2000 FO 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, regulation, cutting and maintenance.

The use of protective goggles is compulsory during cutting operations, as indicated on the machine itself and 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 DELTA 2000 FO key-cutting machine must be installed and used in the way laid down by the manufacturer, as illustrated in this manual.

If the 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 DELTA 2000 FO key-cutting machine and benefit from its potential.**

### FURTHER RISKS

There are no further risks arising from the use of the DELTA 2000 FO key-cutting machine.

### PROTECTION AND SAFETY PRECAUTIONS FOR THE OPERATOR

The DELTA 2000 FO 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 (use of protective goggles) and observation of the instructions provided by the manufacturer in this manual eliminate all human error, unless deliberate.

The DELTA 2000 FO key-cutting machine is designed with features which make it completely safe in all its parts.

#### • Power supply

The key-cutting machine must be supplied with electricity by means of a safety device (supplied with 230V key-cutting machines). The plug must be earthed.

#### • Start-up

The machine is started up by means of:

- 1) the ON button on the safety device (supplied with 230V key-cutting machines);
- 2) the ON switch, situated on the machine, which activates the machine motor.

#### • 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 replaced wrongly or unsafely.

#### • Machine identification

The DELTA 2000 FO is provided with an identification label which shows the serial number (fig.2).

**ATTENTION:** should the machine be left on continuously for over 50 minutes, the cutting tool motor is protected against overheating and will automatically cut out. In such cases, proceed as follows:

- a) turn off the master switch (D) (fig.5, page 4);
- b) let the motor cool for at least 2 hours before using the machine again.

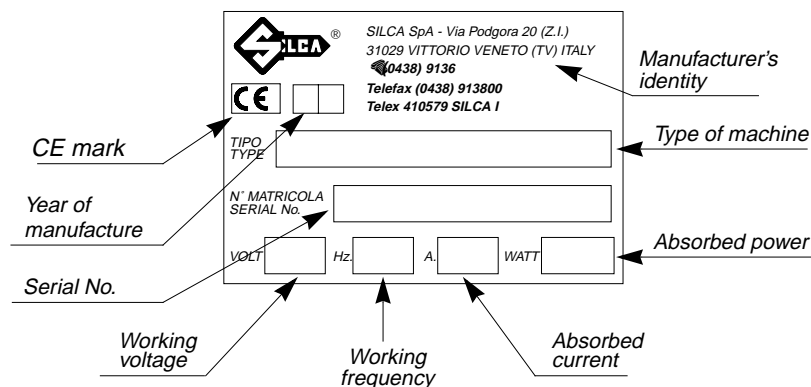
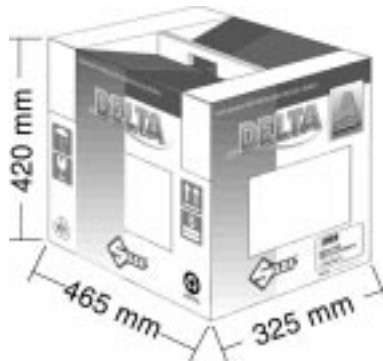


Fig. 2

# 1 TRANSPORT

The DELTA 2000 FO 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 DELTA 2000 FO key-cutting machine comes in a strong cardboard box, the dimensions of which are shown in fig.5, designed to protect the machine and all its parts even when it is stored for long periods.

Fig. 3

## 1.2 Transport

It is advisable to use the packing every time the machine is transported, as this will avoid knocks which could cause damage to the machine, persons or things.

## 1.3 Unpacking

To remove the machine from the packing box, carefully follow the illustrated instructions below:



A



B



C



D

Fig. 4

Check the contents of the box, which should comprise:

- 1 DELTA 2000 FO key-cutting machine;
- 1 set of documents including: operating manual, spare parts list and guarantee;
- 1 chippings tray;
- 1 power cable;
- 1 power supply safety device (supplied with 230V key-cutting machines);
- 1 set of accessories.

## 1.4 Machine handling

When the DELTA 2000 FO 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

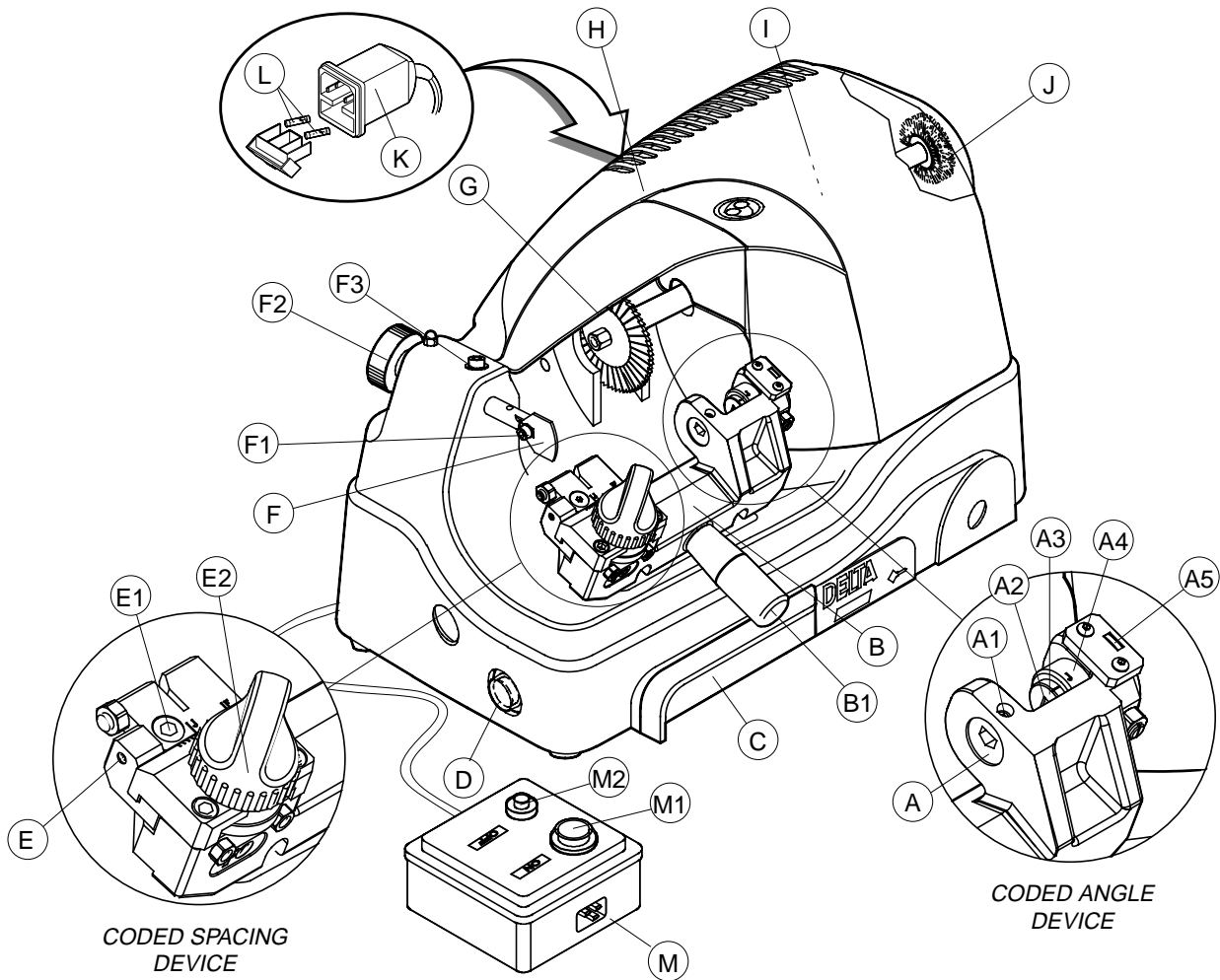


Fig. 5

- A - rotating centring clamp
- A1 - key-locking grub screw
- A2 - tip stop groove
- A3 - Ford/Jaguar selection cylinder
- A4 - coded angle device drum
- A5 - angle code viewing window
- B - carriage
- B1 - carriage lever handle
- C - chippings tray
- D - motor/brush start button
- E - axis regulation grub screw
- E1 - axis regulation locking screw
- E2 - coded spacing device knob
- F - tracer point
- F1 - tracer point locking screw
- F2 - adjusting nut
- F3 - tracer point's group locking screw
- G - cutting tool
- H - carter
- I - motor
- J - brush
- K - supply socket
- L - fuses
  
- M - safety device (supplied with 230V key-cutting machines)
- M1 - ON button
- M2 - OFF button



### 3 MACHINE DESCRIPTION

DELTA 2000 FO is a professional key-cutting machine for FORD® and JAGUAR® car keys. The machine comprises the following main parts:

**SAFETY DEVICE** (supplied with 230V key-cutting machines)

The device is connected to a power plug with a differential switch. It activates the key-cutting machine when the illuminated ON button (M1) is pressed and cuts out when the OFF button (M2) is pressed.

**MASTER SWITCH (D)**

The motor and brush starting button (D) is placed on the left side of the DELTA 2000 FO key-cutting machine.

**ATTENTION:** the switch is constantly illuminated to indicate that the machine is live.

**MOTOR**

The DELTA 2000 FO has a direct drive motor. The transmission unit comprises the motor, cutter and brush and is protected by a single cover (H).

**MOBILE UNIT**

The mobile unit comprises a carriage (B) to which is fitted the coded spacing device and a key-locking clamp with a coded angle device.

The carriage is fitted to the translation shaft and is moved manually by the operator.

It has been designed to avoid the accumulation of cutting dust or chippings.

The key-cutting machine has an inclined table which allows the chippings to collect in the special tray (C) placed under the carriage and easily removable for thorough cleaning.

- **Brush (J)**

The brush is used to eliminate burrs caused by the cutting process and is made of safe materials.

- **Cutting tool (G)**

The cutting tool is the part of the DELTA 2000 FO machine which cuts the key blank. The tool is in HSS super rapid steel and is protected by a special cover (H) to ensure safe operation.

- **Tracer point (F)**

The tracer point is housed on the left-hand side of the machine base. Its depth settings are easily regulated with the ring nut (F2).

- **Coded angle device**

The device comprises:

- tip stop (A2) connected directly to the angle setting device;
- idle bush (A) for centring and locking the key.

- **Key-locking grub screw (A1)**

The key is secured by means of a grub screw which ensures perfect grip on the key.

- **Coded spacing device**

The code device comprises a knob (E2) to activate a graduated slide which determines the position of the various cuts.

### 3.1 Technical data

ELECTRICAL PROPERTIES:	230V - 50Hz 190W 1,5A 110V - 60Hz 250W 3,5A
CUTTING TOOL:	Super Rapid Steel (HSS)
MOTOR:	One speed single phase 230V-50Hz 1350 rpm 0,145 Kw 110V - 60Hz 1700 rpm 0,180 Kw
SAFETY DEVICE:	supplied with 230V key-cutting machines
CLAMP:	rocker
CARRIAGE MOVEMENT:	manual
CARRIAGE RUN (maximum length of cuts):	23 mm
DIMENSIONS:	width: 210 mm depth: 370 mm height: 250 mm
CUTTING NOISE:	Lp (A)= 92,2 dB (A)
NOISE POTENTIAL:	Lw (A)= 104,9 dB (A)
WEIGHT:	Kg. 14

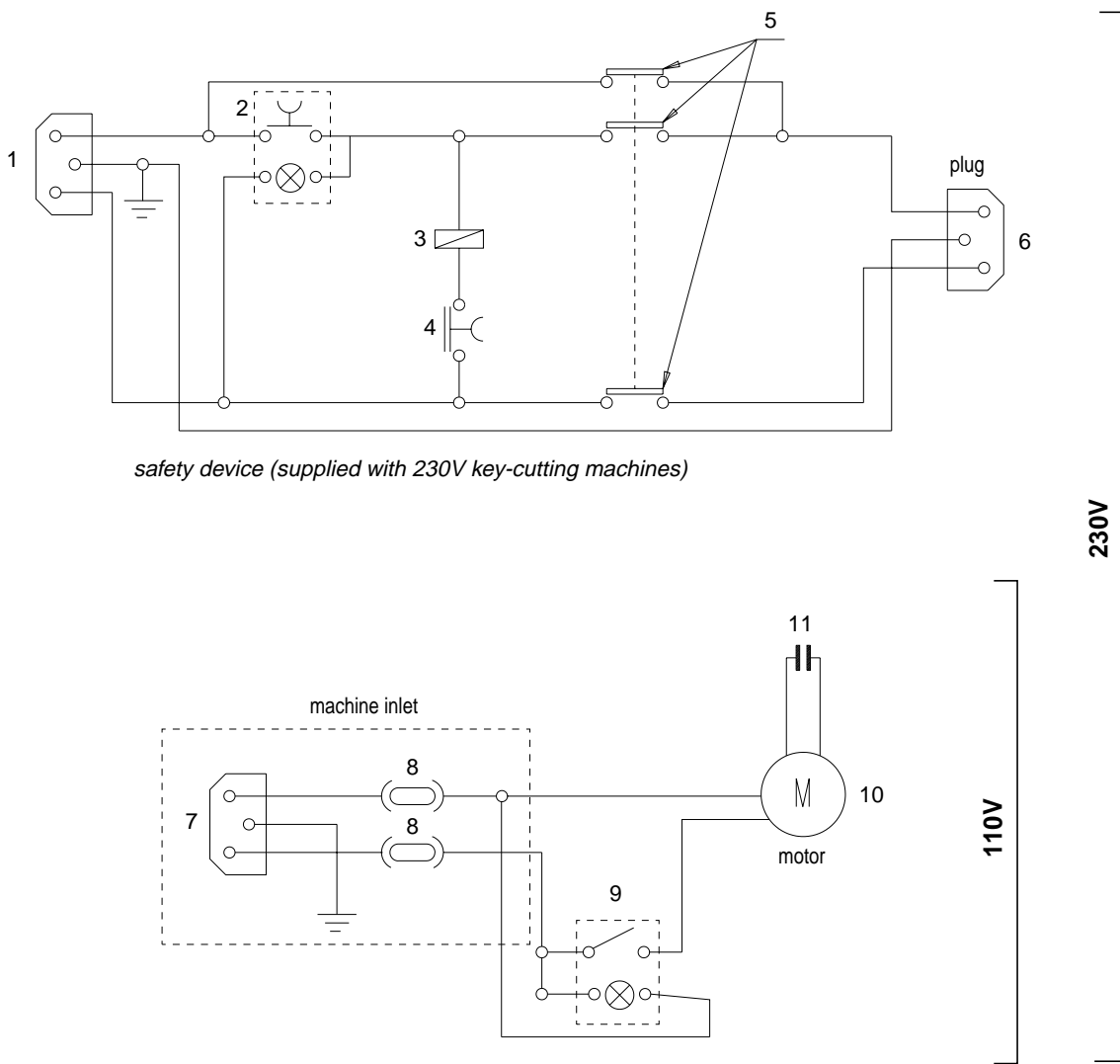
### 3.2 Electrical circuit

The DELTA 2000 FO key-cutting machine is provided with a motor which performs:

- 1350 rpm with consumption of approx. 0,19 kw and absorption of 1,5A on 230V version;
- 1700 rpm with consumption of approx 0,25Kw and absorption of 3,5A on 110V version.

The main parts of the electrical circuit are listed below:

- 1) Safety device inlet
- 2) Illuminated ON button
- 3) 3 contacts relay, 230V a.c.
- 4) OFF button
- 5) Relay contacts
- 6) Safety device plug
- 7) Machine inlet
- 8) Rapid 3,15A fuses (230V); 6,3A (110V)
- 9) Switch with lamp
- 10) Motor: 230V a.c. 50Hz
- 11) 6,3 $\mu$ F condenser on 230V version; 20 $\mu$ F on 110V version



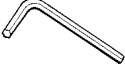
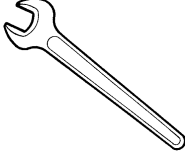

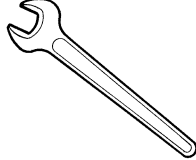
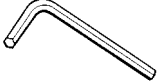
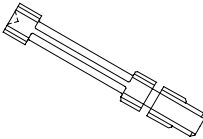



## 4 ACCESSORIES PROVIDED

To ensure trouble-free working with the DELTA 2000 FO, 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 and small replacement parts.

DELTA 2000 FO 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><b>1</b></p>  <p>code <b>D300222ZZ</b> 2,5 mm Allen key</p>	<p><b>6</b></p>  <p>code <b>D312327ZZ</b> 15 mm Spanner</p>
<p><b>2</b></p>  <p>code <b>D300223ZZ</b> 3 mm Allen key</p>	<p><b>7</b></p>  <p>code <b>D301760ZZ</b> 17 mm Spanner</p>
<p><b>3</b></p>  <p>code <b>D300224ZZ</b> 4 mm Allen key</p>	<p><b>8</b></p>  <p>code <b>D413665LA</b> gauging calliper</p>
<p><b>4</b></p>  <p>code <b>D302883ZZ</b> 8 mm Spanner</p>	<p><b>9</b></p>  <p>code <b>D309226ZZ</b> Fuses 5X20 3,15A rapid (230V)</p> <p>code <b>D306748ZZ</b> Fuses 5X20 6,3A rapid (110V)</p>
<p><b>5</b></p>  <p>code <b>D300308ZZ</b> 10 mm Spanner</p>	

## 5 MACHINE INSTALLATION AND PREPARATION

The DELTA 2000 FO 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 DELTA 2000 FO is solid and compact and will not normally damage if transport, unpacking and installation have all been carried out according to the instructions on the packing box. 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 conditions for the machine are:  
temperature: between 0 and 40°C      relative humidity: approx. 60%

### 5.3 Positioning

Place the machine on a horizontal surface, solid enough to take the weight (14 Kg).

To facilitate operation and maintenance, install the machine with a clearance of at least 200 mm on all sides (fig.6).

Check that the weight of the machine is evenly distributed over the four feet; horizontal positioning prevents vibrations during operation.

**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.

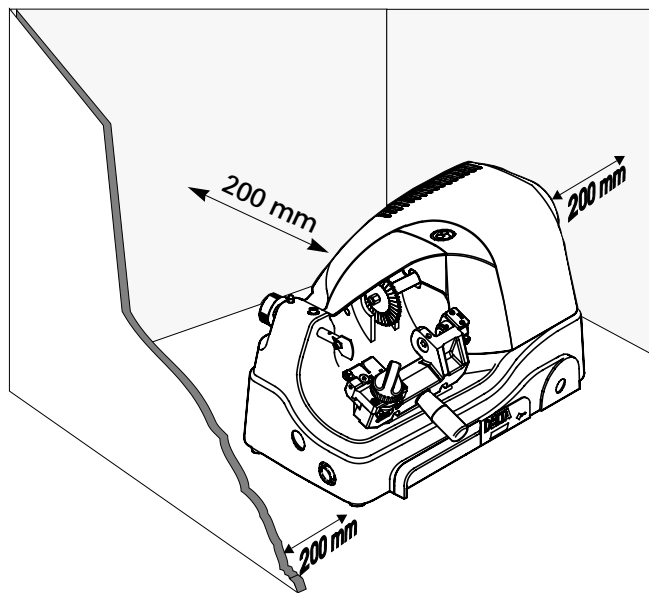


Fig. 6

## 5.4 Description of work station

The machine needs only one operator, who has the following controls at his/her disposal (fig.7):

- safety device (M) (supplied with 230V key-cutting machines).
- master switch (D), placed on the left-hand side of the machine; provided with a warning light indicating that the machine is live.
- carriage lever handle (B1).

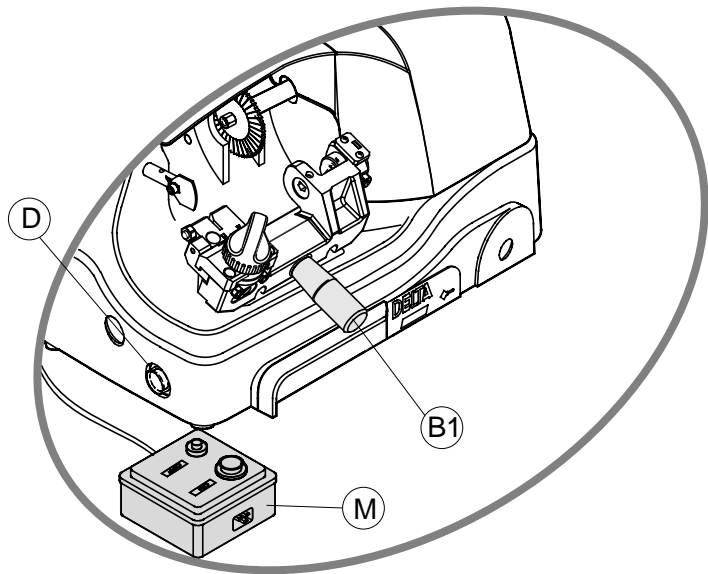


Fig. 7

## 5.5 Graphics



THE USE OF PROTECTIVE GOGGLES IS COMPULSORY

## 5.6 Separate parts

The detachable parts of the machine are packed separately and must be fitted to the DELTA 2000 FO by the operator, as follows:

### POWER CABLE

#### 230V version:

first connect the safety device (M) to the key-cutting machine and the power cable then connect the free end of the power cable to the power mains (fig.8).

#### 110V version:

connect the key-cutting machine and the power cable then connect the free end of the power cable to the power mains (fig.8).

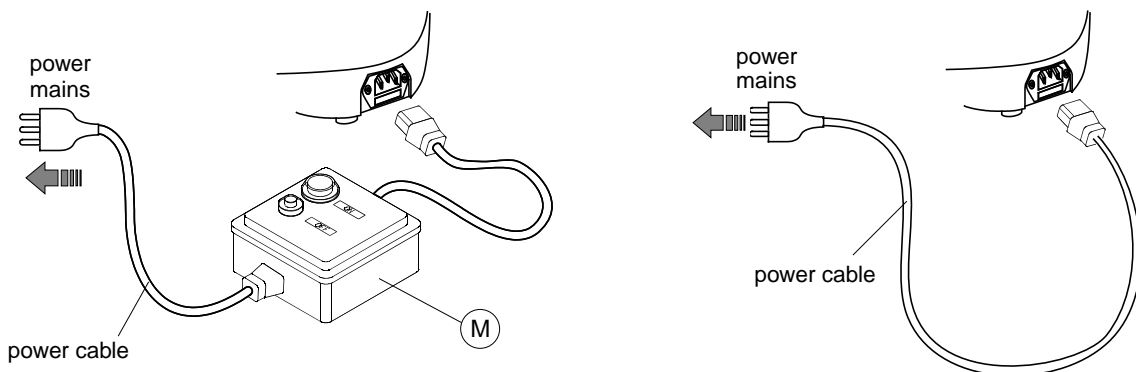


Fig. 8

## 5.7 Connection to the mains

It is extremely important for the operator's safety to ensure that the key-cutting machine is connected to the power mains with the right voltage and by means of a properly earthed differential switch.

## 6 REGULATION AND USE OF THE MACHINE

### 6.1 Checking and Setting

The cutting tool on the DELTA 2000 FO is used to cut the key blanks and must be periodically checked and replaced.

Periodically, and whenever the cutting tool is replaced, check the key-cutting machine settings, to ensure perfect machine efficiency.

### 6.2 Axial gauging

Axial gauging is regulation of the position of the cutting spaces (fig.9).

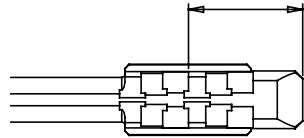


Fig. 9

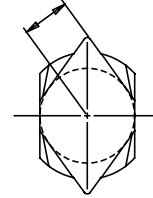


Fig. 10

#### AXIAL GAUGING REGULATION

To regulate the axial gauging, proceed as follows:

**ATTENTION: disconnect the machine from the mains.**

- 1) set up the coded spacing device by means of the knob (E2) so that the indicator "F" is aligned with position "d" (fig.11).
- 2) insert the tip of the gauging calliper (provided) into the rotating clamp (A), push up against the tip stop (A2) and lock in the calliper by tightening the grub screw (A1) (fig.12). The calliper must be positioned horizontally as shown in the illustration; if adjustment is necessary use the hex wrench provided to turn the screw (P) (fig.16, page 13) so that the drum (A4) turns clockwise.
- 3) take the carriage towards the cutting tool and place the tracer point (F) all the way into the locating groove (E3) (fig.11).
- 4) check that the cutting tool enters clearly into the groove (A3) in the gauging calliper. If adjustment is necessary, loosen screw (E1) and adjust axial gauging by means of the grub screw (E).
- 5) when gauging is complete, tighten the screw (E1) well.

#### DEPTH SETTING

Depth setting is regulation of the cutting depth (fig.10). Usually depth setting is not necessary during normal use of the machine. However, if the tracer point is replaced or an optional carriage is used it is advisable to check the depth settings.

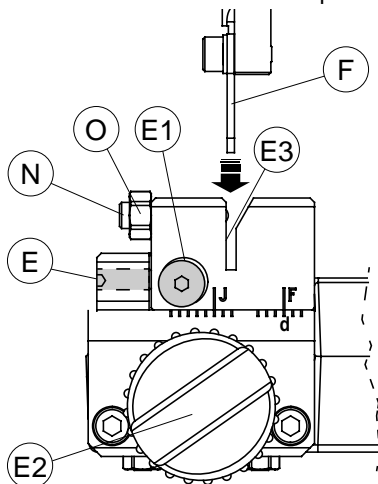


Fig. 11

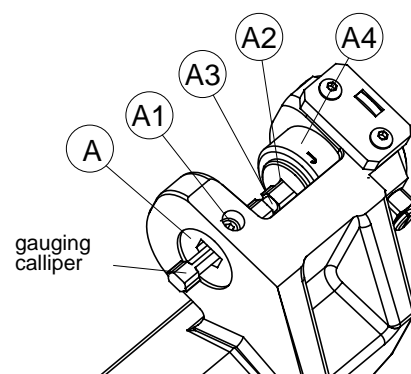


Fig. 12

**REGULATING DEPTH SETTING**

To regulate the depth settings, proceed as follows:

**ATTENTION:** disconnect the machine from the mains.

- 1) set up the coded spacing device by means of the knob (E2) so that the indicator "F" is aligned with position "d" (fig.11).
- 2) insert the tip of the gauging calliper (provided) into the rotating clamp (A), push up against the tip stop (A2) and lock in the calliper by tightening the grub screw (A1) (fig.12). The calliper must be positioned horizontally as shown in the illustration; if adjustment is necessary use the hex wrench provided to turn the screw (P) (fig.16, page 13) so that the drum (A4) turns clockwise.
- 3) take the carriage towards the cutting tool and place the tracer point (F) all the way into the locating groove (E3) (fig.11, page 11).
- 4) check that the cutting tool enters clearly into the groove (A3) in the gauging calliper. If adjustment is necessary, adjust axial gauging in the way described above ("Axial gauging regulation").
- 5) loosen the screw (F3) locking the tracer point unit (fig.5, page 4).
- 6) use the lateral brush (J) to turn the cutting tool shaft in the opposite direction to cutting. The cutting tool should skim the bottom of the groove (A3) on the gauging calliper. If not, turn the ring nut (F2) (fig.5, page 4) clockwise to move the cutting tool unit forward, or in the opposite direction to move it back.
- 7) when the ideal regulation has been reached, tighten the tracer point locking screw (F3) (fig.5, page 4).

If an optional carriage is used, check that the tracer point enters freely into the locating groove (E3) (fig.11, page 11) and that there is not excessive play on it. If necessary, adjust play between the locating groove and tracer point by loosening the nut (O) and turning the grub screw (N).

When adjustment is complete, tighten the nut (O).

**6.3 Cutting operations**

**ATTENTION:** to work in complete safety, pay special attention to the following recommendations:

- Always work with dry hands.
- Check that the machine is properly earthed.
- Use the protective goggles, even if the cutting tool is fitted with a protective shield.
- Start the motor only when all the operations with the carriage have been carried out (securing keys, etc.).
- Keep hands away from the cutting tool when in motion.

**6.4 Key cutting****PLACING KEYS INTO CLAMP**

- 1) place the key blank into the rotating centering clamp (A) (fig.13).
- 2) push the key tip up against the tip stop groove (A2). Hold down the key and lock into the rotating clamp with the grub screw (A1).

**ATTENTION:** when cutting original FORD keys with lights, before locking into the clamp detach the part containing the electrical devices, otherwise the head is too big (fig.14).

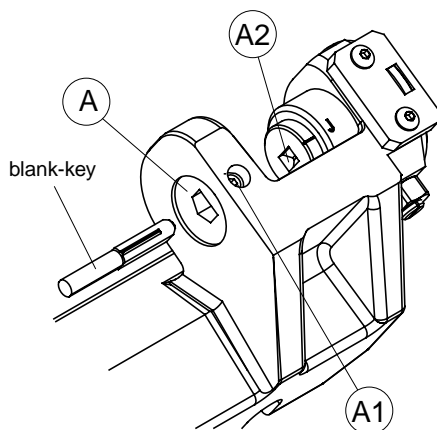


Fig. 13

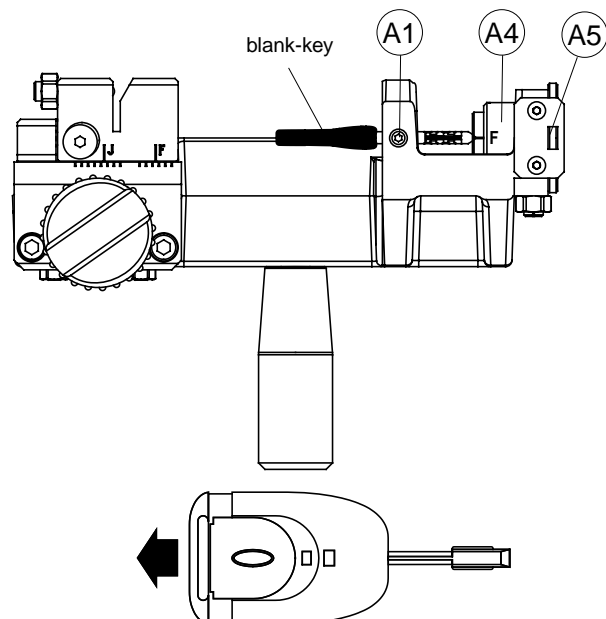


Fig. 14



## 6.5 Checking set codes (Ford - Jaguar)

The machine can cut both Ford and Jaguar keys following a simple operation to carry out on the coded angle device. To check the current setting, proceed as follows:

- 1) place the key blank tip into the rotating clamp (A) and push up against the tip stop groove (A2).
- 2) continue to push, and check that the key is in the vertical position (fig.14) and the number "1" is visible in the window. If necessary, turn the key until it is properly positioned.
- 3) check the reading on the drum (A4). If the letter "F" is visible the device is set for cutting Ford keys, if the letter "J" is visible the device is set for cutting Jaguar keys. The machine leaves our workshops set for cutting Ford keys.

## 6.6 Setting the coded device

To change the coded device setting from FORD to JAGUAR and vice versa, proceed as follows:

- 1) place the key blank tip into the rotating clamp (A) and push up against the tip stop groove (A2) (fig.13, page 12).
- 2) hold the key head firmly and use the left hand to loosen the screw (P) (fig.16) with the wrench provided.
- 3) exert slight pressure in the direction of the arrow (fig.16) and unscrew the screw (P) slowly so that the cylinder (A3) protrudes a few millimetres (fig.15).
- 4) use the key head to turn the cylinder 90° in the direction of the arrow.
- 5) let the cylinder (A3) withdraw and press on the key head to tighten screw (P). The cylinder must return freely into its seat. If necessary, seek its proper position by turning the key slightly in the two directions.
- 6) turn the key 90° to pull the coded angle device. The letter visible on the drum (A4) will now be different, as will the colour of the numbers in the window (A5).

## 6.7 Coded key-cutting

To cut a key blank by code, see the instructions below:

- 1) check that the coded device has been properly set for the type of key to be cut (see points 6.5 and 6.6).
- 2) place the key blank into the rotating clamp (A) and push against the tip stop groove (A2) (fig.13, page 12). Hold the key down in the rotating clamp (A) and tighten the grub screw (A1) with the wrench provided.
- 3) set the cutting position on the coded spacing device by means of knob (E2) (fig.15). Exert pressure on the head to turn the key and turn the angle counter (Q) (fig.16) until the required code is visible in the window (A5).
- 4) start the machine with the motor/brush start switch (D).
- 5) take the carriage towards the cutting tool, ensuring that the tracer point enters the locating groove all the way (fig.15). When the cut has been made, move the carriage back and turn the key until the same code appears in the window (A5), after the number "1" has appeared. Repeat the cutting operation.
- 6) when the cut has been made, move the carriage back and give the key a half turn until the same code appears in the window (A5). Repeat the operation described in point 5.
- 7) the key has now been cut on both sides for the first cutting position. Go on to the following position and repeat the cutting operations with the relevant code, and so on until all the cuts have been made.
- 8) pull back the carriage, turn off the machine, loosen the grub screw (A1) and remove the key.

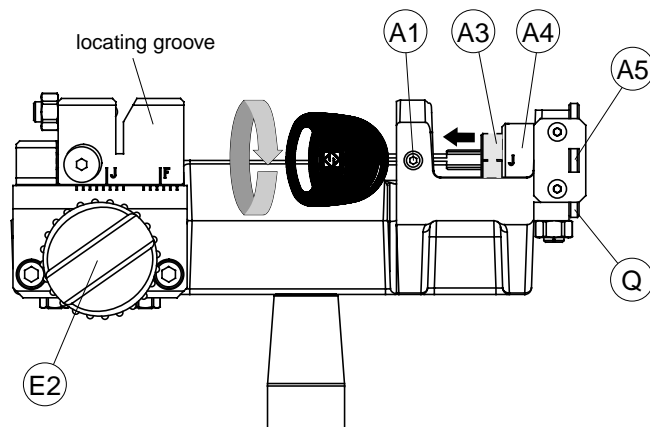


Fig. 15

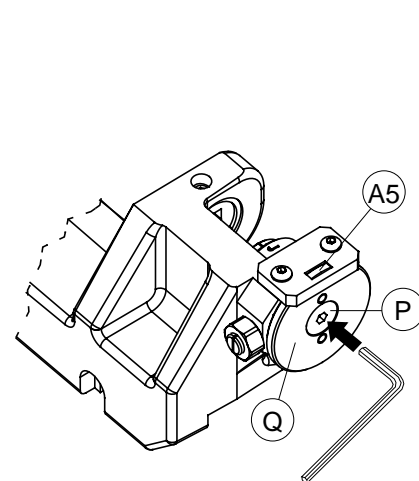


Fig. 16

## 7 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 DELTA 2000 FO key-cutting machine does not require special maintenance, it is advisable to check and, if necessary, replace the parts subject to wear (cutting tool, brush, tracer point). Replacement is simple and can be carried out by the operator.

**CLEANING:** it is advisable to use a soft brush to keep the carriage and clamps free of chippings from cutting operations.

**ATTENTION: DO NOT USE COMPRESSED AIR!**

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.

### 7.1 Cutting tool replacement

It is not necessary to remove the protective shield in order to replace the cutting tool (G).

**ATTENTION: unplug the machine from the mains.**

- 1) place the spanner provided in position on the motor shaft (fig.17);
- 2) use a suitable spanner to loosen the new cutting tool locking nut.

**ATTENTION: the thread is left-handed.**

- 3) replace the cutting tool after cleaning its seat;
- 4) install the new cutting tool and tighten the nut.

**ATTENTION: the tool rotates clockwise.**

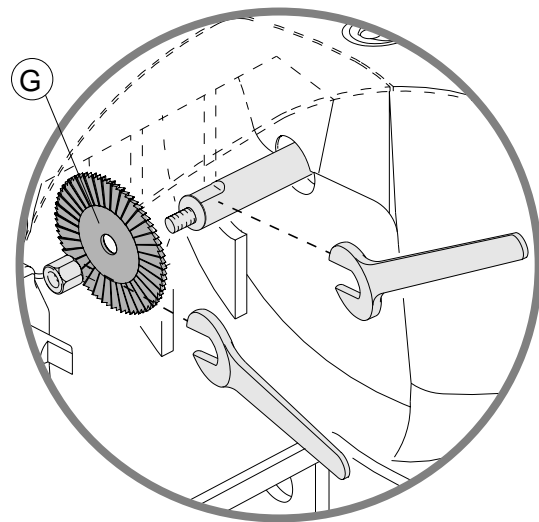


Fig. 17

### 7.2 Brush replacement

When the brush (J) is no longer effective it must be replaced, as follows:

**ATTENTION: unplug the machine from the mains.**

- 1) place the spanner provided in position on the motor shaft (fig.17);
- 2) use the wrench provided to loosen the brush locking screw (X) (fig.18);
- 3) replace the brush and secure with the screw;
- 4) remove the spanner from the motor shaft.

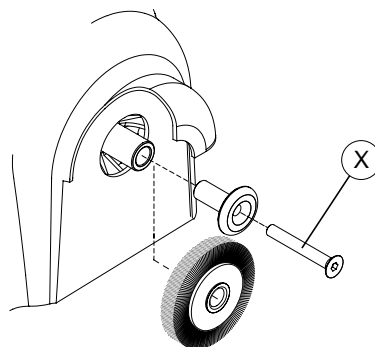


Fig. 18

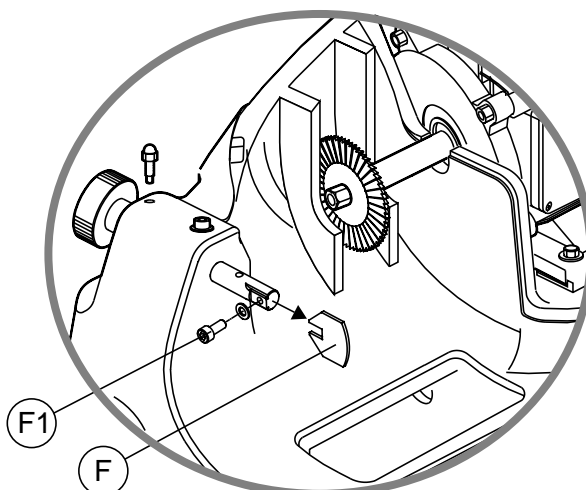
### 7.3 Tracer point replacement

To replace the tracer point (F), proceed as follows (fig.19):

**ATTENTION:** unplug the machine from the mains.

- 1) loosen and remove the tracer point locking screw (F1).
- 2) remove the tracer point.
- 3) fit the new tracer point.
- 4) re-gauge the machine as described in chapter 6 on page 11.

Fig. 19



### 7.4 Replacing the fuses

**ATTENTION:** unplug the machine from the mains.

- 1) detach the wiring from the machine plug;
- 2) turn the key-cutting machine so that the fuse box is easily reached;
- 3) remove the fuse box placed below the power inlet (K) (fig.20);
- 4) replace the fuses (L);
- 5) close the fuse box and connect the power cable.

**ATTENTION:** the fuses must both be of the same type (rapid) and with the same amps (3,15 Ampere on 230V, 6,3 Ampere on 110V).

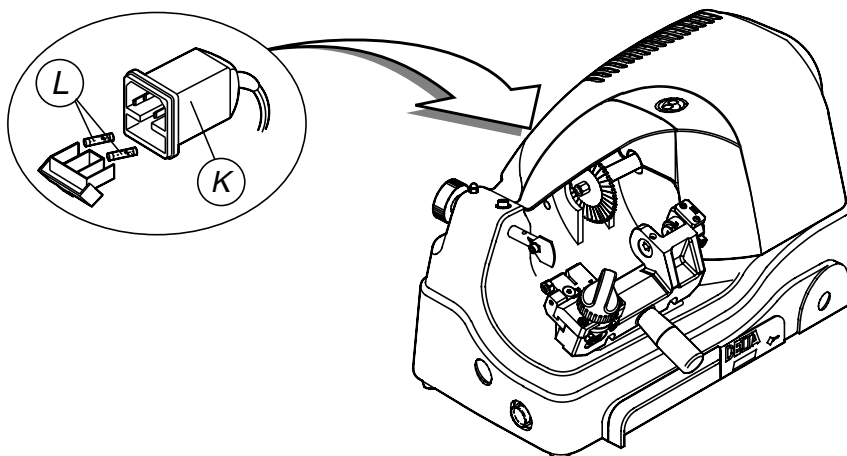


Fig. 20

## 8 WASTE DISPOSAL

EU regulations establish special arrangements for the disposal of waste (\*).

- **Waste deriving from cutting operations**

Although residue coming from the key-cutting operations is classified as special waste, it is included in solid urban waste (SUW) as metal wool.

Such waste is sorted according to its classification under current Italian and EU law and consigned to the proper disposal units.

Cases where waste can be considered contaminated or containing toxic/harmful substance sufficient to transform it from SUW to toxic/harmful waste, are listed in the enclosures to current Italian and EU waste disposal regulations.

Re-cycling is a recommended ecological practice.

- **Packing**

The DELTA 2000 FO is consigned in a cardboard packing box which can be re-used if undamaged. When it is to be thrown away it is classified as solid urban waste and should be placed in the special paper collecting bins.

(\*)"Waste" is any substance or object deriving from human activity or natural cycles, thrown away or to be thrown away.

## **9 ASSISTANCE**

Silca provides full assistance to purchasers of the DELTA 2000 FO 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. On the back cover of this manual is a list of the manufacturer's addresses; listed below are the addresses of specialised Service Centres.

### **9.1 How to request service**

The guarantee attached to DELTA 2000 FO key-cutting machine ensures free repairs or replacements of faulty parts within 12 months of purchase. All other service calls must be arranged by the customer with Silca or with a Silca Service Centre.



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