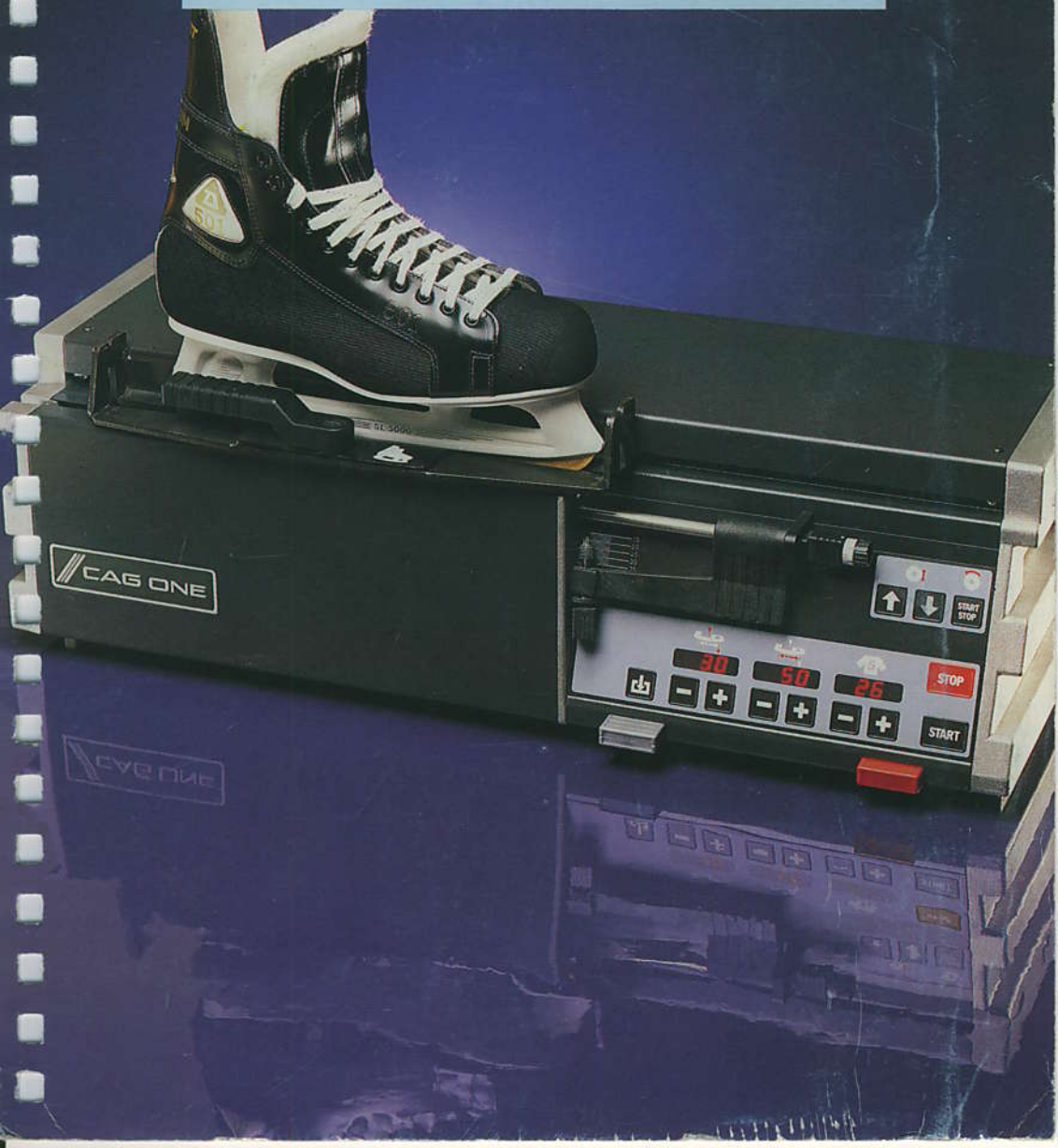


 **CAG ONE**  
COMPUTER AIDED GRINDING

# Users' Manual



**Read this entire manual carefully before use. It is important that you are aware of the various subfunctions.**

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# 1. INTRODUCTION

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CAG ONE is the modern solution to the problem of sharpening ice skates identically time after time. The result is always perfect, thanks to high precision.

CAG ONE is completely automatic. Thus, no special knowledge is required of the user. The machine is so easy to use that anyone can sharpen ice skates with perfect results, with a minimum of training.

CAG ONE is developed in cooperation with leading experts on ice skate sharpening, equipment managers, and top players in Sweden and Canada.

## Sharpens Gliding Surfaces

CAG ONE sharpens gliding surfaces on hockey skate blades. The gliding surface can be located on the ice skate blade as desired.

The gliding surface is the flat surface that is in contact with the ice while skating. The gliding surface used depends on each player's individual taste.

CAG ONE automatically grinds a gently formed profile on each end of the gliding surface.

## Sharpens Automatically

The skate is placed in the holder and clamped firmly in place. The gliding surface's length and position is entered at the keyboard. Then, the machine is started, and the desired profile is grinded.

- \* Firstly, the machine measures the blade at a large number of measurement points.
- \* Secondly, the machine makes calculations from the measurements and the gliding surface desired to determine how the ice skate should be sharpened.
- \* Finally, the blade is grinded to the desired shape.

While the machine is sharpening, the number of remaining grinding passes is displayed in the number display window. Each pass grinds one hundredth of a millimeter.

The number of grinding passes always varies slightly even if the correct gliding surface has been achieved.

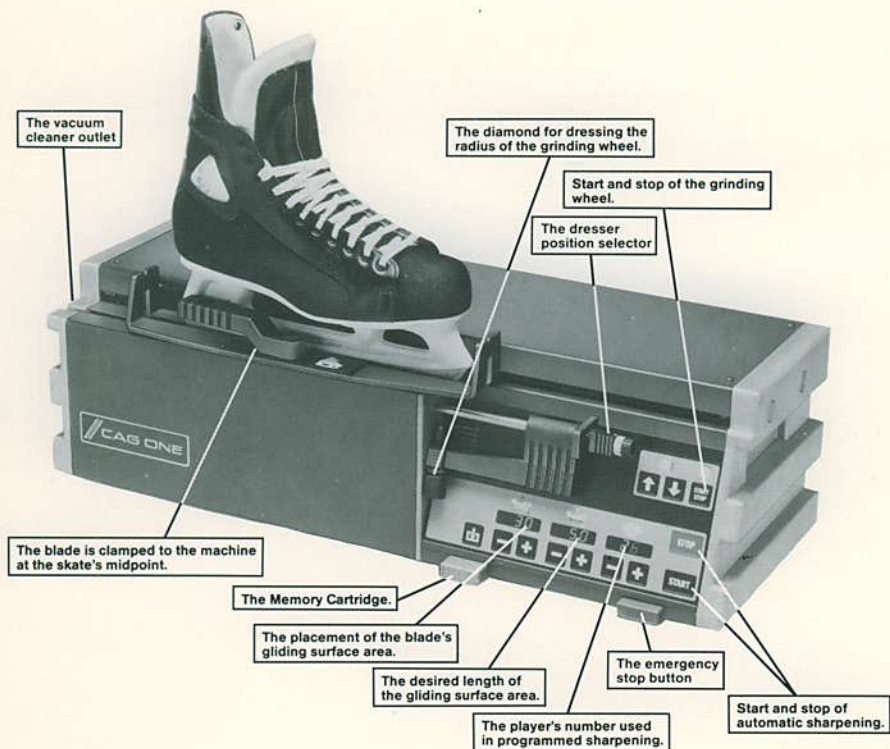


# 1. INTRODUCTION

## Automatic Monitoring

CAG ONE monitors several factors that are important for good sharpening results. Warnings, expressed as illuminated symbols, appear on the keyboard and remain on until the appropriate steps are taken. The following factors are monitored:

- \* the diameter of the grinding stone
- \* the wear of the blade
- \* skate installed improperly
- \* the sharpness of the grinding stone
- \* the position of the dressing arm



# 1. INTRODUCTION

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## Subsystems

### Holder

The holder has a groove and a clamping device to hold the blade. Bent blades are straightened when they are clamped in. The holder is dimensioned for blade widths ranging from 2.8 mm (0.11 in.) to 4.5 mm (0.18 in.).

### Dresser

The dresser is made up of a folding arm with a diamond. At the rear of the dresser is a selector for different blade widths.

### Shot Guard

The shot guard keeps the grinding disk out of reach. The shot guard also has a dust-collecting receptacle on its inside. The power supply to the sharpener is cut off when the guard is opened.

### Keyboard

This has separate functional fields for setting gliding surfaces, dressing, the warning symbols, and using the Memory Cartridges.

### Memory Cartridge

There are different kinds of Memory Cartridges for storing the players' individual gliding surfaces. There are Memory Cartridges for goalie and figure skates.

CAG ONE is compact, sturdy, and constructed entirely of metal to withstand rough handling.

Weight: 25 kg (55 lbs)

Length: 720 mm (28 1/2 in.)

Height: 220 mm (8 in.)

Depth: 260 mm (10 1/4 in.)

Power requirements: 115 V, 60 Hz, max. 3 A

Environment: Operating temperature 2–30°C (35–85°F)

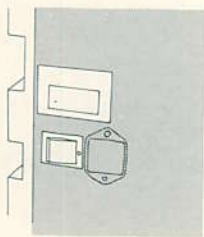
## 2. INSTALLATION

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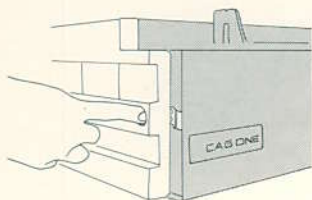
### Unpacking

1. Remove the transportation guards by following the enclosed, separate instructions. Save the guards for future transport of the sharpener.

2. Place the machine on a firm base. Make sure there is sufficient space on both sides of the machine to allow for the movement of the ice skate holder.



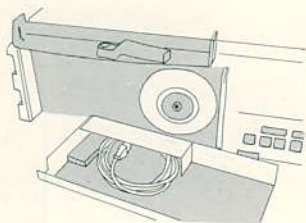
3. Make sure that the voltage of the machine matches the wall socket.



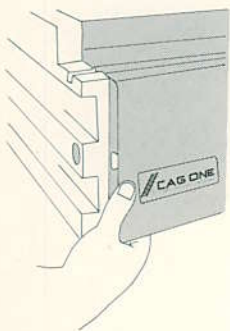
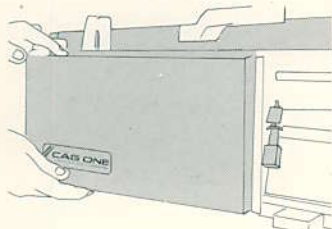
4. Open the shot guard by pushing the button on the left end of the machine. Take out the electric cord, the Memory Cartridges, and the grinding stones.

## 2. INSTALLATION

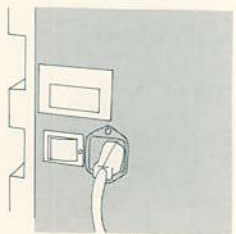
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5. Check that the grinding stones have no defects and install one of them firmly.



6. Reattach the shot guard by lining up the groove on its right side with the corresponding groove on the sharpener. Then press the left side, which locks the guard firmly in place.



7. Connect the power cord to the machine.

8. Also see safety instructions.  
USA only: Secure the power cord mounting bracket to the machine with the supplied screws.

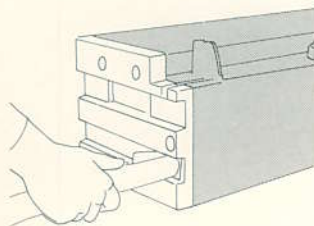


## 2. INSTALLATION

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### Connecting a Vacuum Cleaner

1. In permanent installations, the sharpener should be equipped with an external vacuum cleaner attachment. There is an outlet on the left side of the sharpener for this purpose.



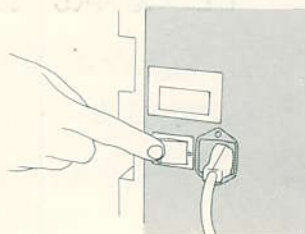
2. Open the outlet on the left side of the sharpener by folding back the plastic cap.

3. Attach a vacuum cleaner hose that is 31-32 mm (1.22-1.26 in.) in diameter.

## 2. INSTALLATION

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# Turning On the Machine



1.  
Turn on the switch located on the rear of the machine.

2.  
If the machine does not respond when being switched on, check the following:  
\* that the emergency stop button on the front of the machine is pulled out;  
\* that the shot guard has been correctly attached;  
\* that the fuse is intact. (See page 7:3.)

3.  
When turning on the machine, the machine carries out automatic function checks and calibrations.

***Never touch the machine during calibration.***

4.  
When the stone has touched the ice skate grip several times and then returned to its lower position, the calibration procedure is complete, and the machine can be used for sharpening.

***Remove skate from the machine before calibration.***

### 3. OPERATION

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## Mounting the Ice Skate

1. Open the holder.  
The holder is opened by moving the handle to the right.



2. Place the skate in the groove.  
The tip of the skate should face to the right. Allow the blade to rest on the holder.

**Attach the middle of the blade at the holder's reference mark.**

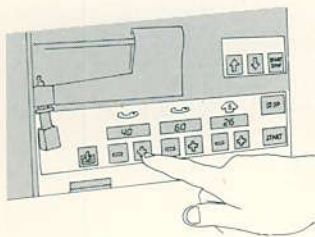


3. Clamp the blade in place.  
The blade is clamped by moving the handle to the left. After clamping, the handle is normally parallel with the holder.
4. When mounting a goalieskate, the handle should not be fully tightened.

### 3. OPERATION

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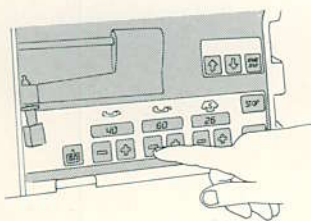
## Setting the Gliding Surface



1. Set the starting point of the gliding surface.

Enter the gliding surface's starting point in millimeters, measured from the midpoint of the blade. The starting point always falls either on or in front of the blade midpoint. The value is shown in the number display window, zero being the holder's midpoint.

The starting point's distance from the midpoint is increased by pressing the + key. It is decreased with the - key.



2. Set the gliding surface's length.

The gliding surface begins at the starting point and extends back the given distance. The length is expressed in millimeters.

The shortest gliding surface that can be set is 10 mm. The + key is used to increase gliding surface length. The - key is used to decrease gliding surface length.



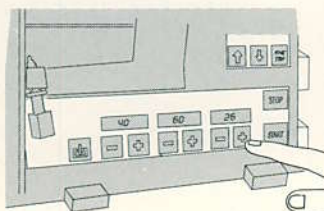
### 3. OPERATION

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## Setting the Gliding Surface with the Memory Cartridge



1. Insert the Memory Cartridge with the stored gliding surface settings.



2. Select a player number.

Gliding surfaces for a total of 99 players can be stored on one Memory Cartridge. The player number can be increased or decreased with the + and - keys, respectively.

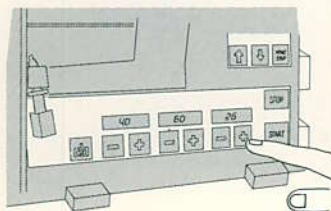
### 3. OPERATION

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## Storing Gliding Surface Settings on the Memory Cartridge

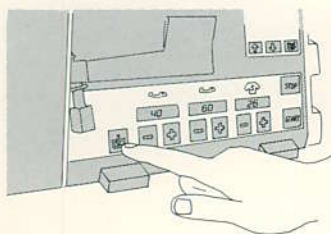


1. Insert a Memory Cartridge.



2. Select the player number whose gliding surface is to be stored.
3. Enter the values for the gliding surface's starting point and length.

**See "Setting the Gliding Surface" (p. 3:2).**



4. Press the save key.  
The gliding surface for the player shown in the display window is stored on the Memory Cartridge.

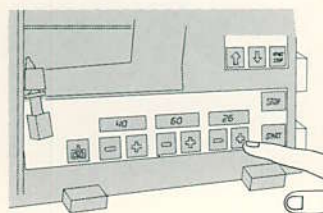
### 3. OPERATION

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## Storing Gliding Surface Settings for Goalies on the Memory Cartridge

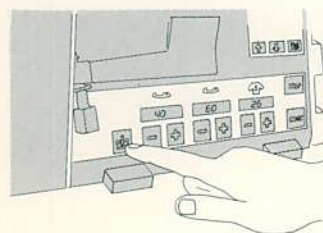


1. Enter a Goalie Memory Cartridge.  
This cartridge contains values for one player only.



2. Select the player number whose gliding surface is to be stored.
3. Enter the values for the gliding surface's starting point and length.

**See "Setting the Gliding Surface" (p. 3:2).**



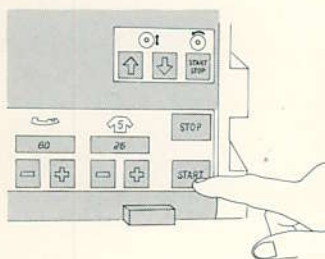
4. Press the save key.  
The gliding surface for the goalie is stored together with player's number on the Memory Cartridge.

## 3. OPERATION

# Sharpening

**Always wear safety glasses when sharpening.**

1. Place the ice skate in the holder.
2. Enter the gliding surface's starting point and length.  
If a Memory Cartridge is in place, select a player number.
3. Press the start key.



The machine now measures the blade and sharpens according to the gliding surface displayed.

After starting, sharpening can be interrupted with the stop key. The machine then automatically returns to the starting position.

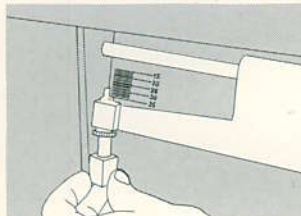
**Never touch the machine during sharpening.**

4. The emergency stop on the front of the sharpener cuts off the power supply. The machine can be restarted by pulling out the red emergency button. When restarting, the sharpener makes its normal calibrations (see page 2:4). No ice skate may remain in the sharpener during calibration after restart.



## 3. OPERATION

# Dressing the Grinding Stone

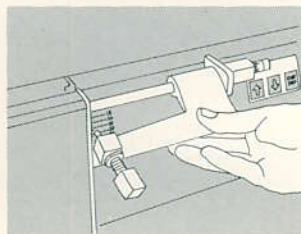


**Always use safety glasses when dressing the grinding stone.**

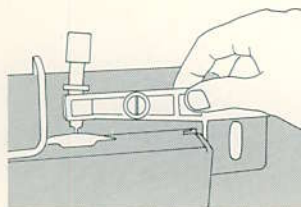
1. Select the desired radius.

Loosen the diamond's locknut and turn the diamond to the desired radius. Lock the diamond in place with the locknut.

The ruler on the sharpener expresses the radius of the hollow-ground center of the blade in millimeters. To check if the correct radius has been set, refer to the ruler.



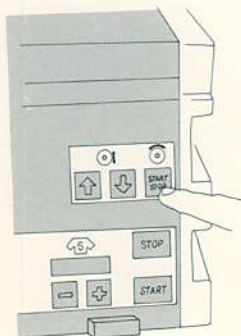
2. Check that the desired blade width is set. It can be adjusted by turning the selector on the right of the dresser arm's base. A normal blade is 2.9 mm wide.



3. Raise the dressing arm.

**Make sure that no ice skate is in the holder when dressing.**

The ice skate holder and grinding stone move automatically to a starting point for dressing.

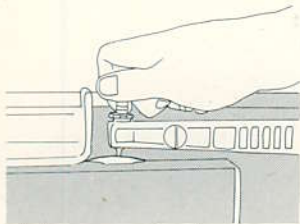


4. Move the entire dressing arm as far to the left as possible. Check the height of the stone, adjust up or down by pressing the arrows.

5. Start the grinding motor by pressing the start-stop key.

### 3. OPERATION

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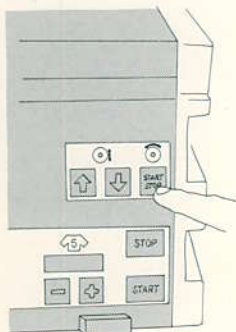
6. Move the diamond slowly backwards and forwards over the grinding stone.

7. Gradually increase the grinding depth by pressing once on the key that raises the grinding disk.

Every time the key is pressed, the grinding stone is raised one little step, for even sharpening.

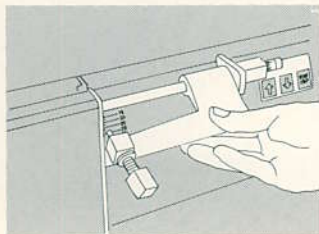
8. Repeat sequence 6 and 7 until the surface is even and clean.

9. Finish by moving the diamond slowly backwards and forwards over the grinding disk without increasing the grinding depth.



10. Stop the grinding motor.

The grinding motor is stopped with its start-stop key.



11. Lower the dressing arm.

The machine automatically moves the ice skate holder and the grinding stone to the sharpening start position.

When dressing is completed, the machine measures the new disk diameter.

### 3. OPERATION

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## Dressing the Grinding Stone for Goalie Ice Skates

***Always use safety glasses when dressing the grinding disk.***

1.  
Turn the selector on the dressing arm's base to the desired blade width. The normal blade width for goalie ice skates is 4.2 mm.
2.  
Continue as for dressing the grinding disk. See p. 3:7.

## Sharpening Goalie Ice Skates

***Always use safety glasses when sharpening goalie ice skates.***

1.  
Dress the stone for the sharpening of goalie ice skates.

***See "Dressing the Grinding Disk for Goalie Ice Skates" (above).***

2.  
Insert the Memory Cartridge for goalie ice skates.

3.  
Set the gliding surface's starting point and length, via either the keyboard or the Memory Cartridge.

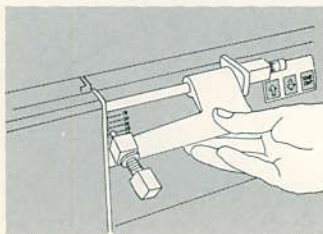
Goalie ice skates are normally grinded to a long gliding surface.

4.  
Start sharpening the ice skate.

***See "Sharpening" (p. 3:6).***

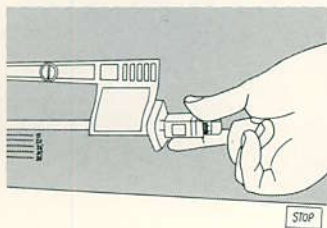
## 3. OPERATION

# Dressing for Flat Surface Grinding



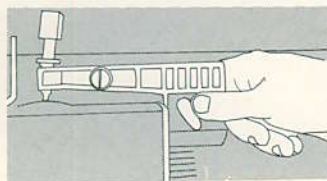
**Always use safety glasses when dressing the grinding stone.**

1. Raise the dressing arm.



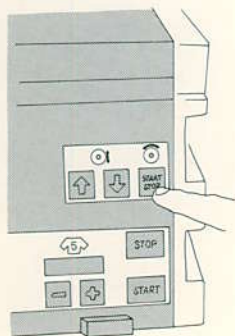
2. Set the selector in the position for flat surface dressing.

Pull out the selector on the right side of the dresser arm's base. Turn the selector to a fixed position, so that the dresser arm can be moved back and forth with ease.



3. Move the dresser arm to the left, so that the diamond is directly over the grinding stone.

4. Lock the dresser arm to the shaft with the lever on the dresser arm.



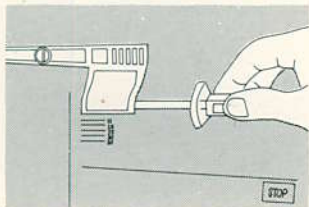
5. Start the grinding motor.

Use the start-stop key to start the grinding motor.



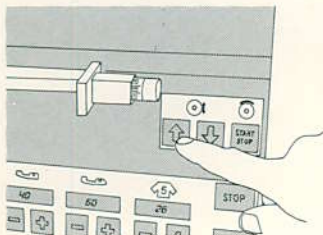
### 3. OPERATION

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6. Slowly move the selector at the rear of the dresser shaft back and forth.

This passes the diamond over the grinding disk in a level, back-and-forth motion.



7. Gradually increase the grinding depth by pressing the grinding depth key.

8. Turn off the grinding motor.

The grinding motor is turned off with its start-stop button.

9. Release the lock between the dresser arm and the dresser shaft.

10. Turn the selector to the normal position and release it into the locked position.

11. Lower the dresser arm.

## 4. KEYBOARD

### Gliding Surface Position



40



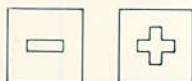
To set where the gliding surface should begin on the blade. The position is expressed in millimeters, calculated from the midpoint of the blade towards to the toe of the ice skate.

The position of the gliding surface always begins on or in front of the blade midpoint. A value of zero indicates the midpoint of the blade. Increase or decrease the entered value with the + and - keys.

### Gliding Surface Length



60



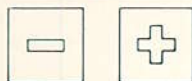
To set the gliding surface's length. The length is expressed in millimeters and is calculated from the selected position backward.

The minimum selectable length is 10 mm. Increase or decrease the entered value with the + and - keys.

### Player Register

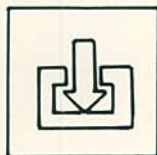


26



To select the players' individual profiles. Up to 99 different players can be stored and selected on the Memory Cartridge. The player register is accessible only if a Memory Cartridge is inserted in the machine. Increase or decrease player numbers with the + and - keys.

### Storing Player Information



To store the profile entered for the player displayed. The Memory Cartridge must be inserted in the machine.

Note especially that simply making changes to the display does not change information stored on the Memory Cartridge.

## 4. KEYBOARD

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### Start



To begin grinding the selected profile.

### Stop



To interrupt work in progress, whether measuring or grinding. The machine returns automatically to the starting position.

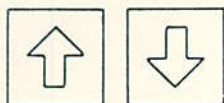
### Manual Control of the Motor



To start and stop the grinding motor manually. This is used when dressing.

Use the same key both to start and stop the motor.

### Manual Adjustment

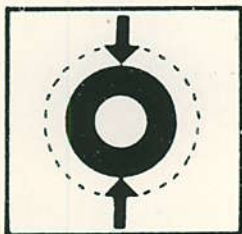


To move the grinding stone up and down manually. Use this to set the grinding disk's height when dressing. One press of the key gives a height adjustment of 0.022 mm. This is a value tuned for optimal dressing of the grinding stone.

## 5. WARNING SYMBOLS

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### Small stone diameter



The grinding disk is so worn down that the machine can not operate correctly.

***Replace the grinding stone. Use only CAG ONE original parts.***

### Worn blade



The ice skate blade is so worn out that it should be replaced.

***Replace the blades on both skates.***

### Improper blade alignment



The blade is not properly aligned in the holder.

***Remove the ice skate and clamp it in straight.***

### Dress



The grinding stone needs dressing. After many grindings, metal particles store into the stone itself, so it grinds poorly.

***Dress the grinding stone.***



## 5. WARNING SYMBOLS

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### Dresser arm raised



This warns that the dresser arm is in the raised position. When the dresser arm is raised, the holder and grinding stone automatically moves to the starting position for dressing. When the arm is lowered, the machine returns to the normal starting position.

***If the machine doesn't respond normally, yet the symbol is illuminated, lower the dresser arm.***

### Service



The machine's monitoring system has found a serious error; it can not be easily repaired.

***Contact your nearest authorized service representative.***

## 6. ERROR CODES

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**E3**

The grinding motor is so overloaded that the number of revolutions has fallen below a critical level. When the revolution rate is too low, the grinding stone does not grind the metal properly. The reason is usually either that the grinding stone surface is imbedded with metal fragments or that the stone is not round.

***Dress the grinding stone.***

**E5**

Defective Memory Cartridge.

***Replace the Memory Cartridge.***

**E7**

Grinding has started without an ice skate in the holder. Or, an ice skate may have been in the holder when the current was turned on and while the machine carried out its calibrations and measurements or while dressing the stone.

***Put an ice skate in the holder. Or, turn off the machine and switch it on again without an ice skate in the holder.***

**E8**

Strong interference when the blade was measured. This may be temporary, or may indicate an error in the machine.

***Try again. If the problem continues, contact your nearest authorized service representative.***

**E9**

The grinding stone does not rotate, even though the motor is on. This may be because the stone is stuck.

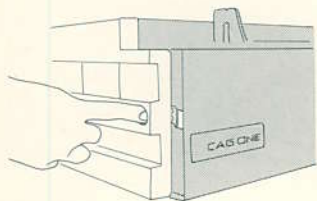
***Free the grinding stone or check that the stone is free of flaws.***

## 7. MAINTENANCE

# Replacing the Grinding Stone

1. Switch off the machine by turning off the power switch.

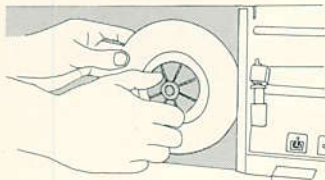
***Pull the plug out of the wall socket.***



2. Open the shot-guard cover.  
The shot-guard cover is unlocked by pushing the button in the left end of the machine case. Remove the cover from the machine.

3. Empty the grinding dust from the cover's dust-collecting receptacle.

4. Remove the grinding stone.  
Loosen the stone from the shaft by holding the grinding stone still while turning the hub counterclockwise.

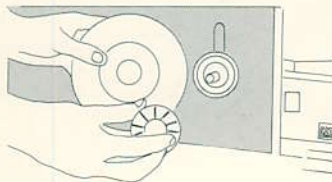


If the grinding stone sticks, a screwdriver or the accompanying ruler may be used in the groove on the shaft.

5. Check that the new grinding stone has no defects.

Tap the grinding disk lightly with a hard object. You should hear a clear tone if the disk has no cracks.

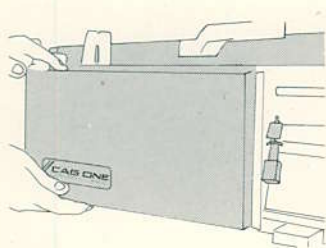
***Use only CAG ONE original grinding stones.***



6. Install the new grinding stone on the shaft.  
Tighten the hub.

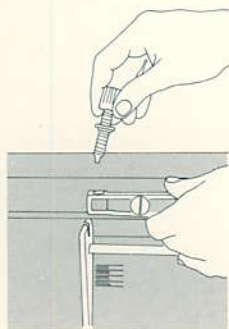
## 7. MAINTENANCE

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7. Attach the shot-guard cover.  
Check that the cover is properly locked.  
Plug in the power cord and turn on the power switch.
8. Dress the new grinding stone round and to the desired radius.

## Replacing the Diamond



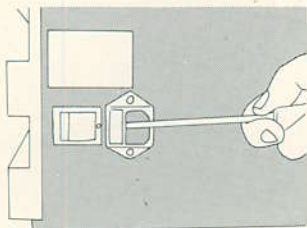
1. Turn the power switch off.
2. Pull the skate holder over to one side and raise the dresser arm.
3. Remove the lock washer and unscrew the worn diamond.
4. Screw the lock washer onto the new diamond.
5. Screw the new diamond in place on the dresser arm. Use only CAG ONE original diamonds.
6. Lower the dresser arm and set the desired radius according to the ruler.
7. Lock the setting in place with the lock washer.



## 7. MAINTENANCE

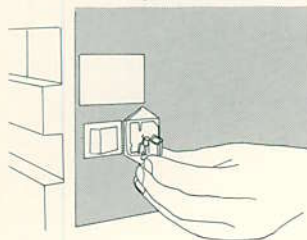
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### Changing Fuses



1.  
Disconnect the power cord.

2.  
Remove the fuse holder.  
The fuse holder is located on the left side of the power input socket on the rear of the machine. Use a screwdriver to loosen the spring lock.



3.  
Put a new fuse in the clip.  
The inner clip holds the fuse that is connected to the current.

4.  
Push in the fuse clip so that it locks in place.

5.  
Connect the power cord

### Cleaning

1.  
Always wipe the machine with a soft, damp cloth after use. Be sure that the dresser shaft and holder are clean and free of grinding dust.

***Regular cleaning minimizes wear.***

2.  
Always empty the machine's dust-collecting receptacle in the shot guard after use.

***Always empty the machine before moving it.***

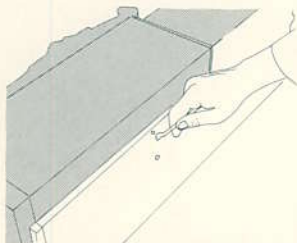
***Never use compressed air for cleaning. This may force dust into the machine and cause damage.***

## 7. MAINTENANCE

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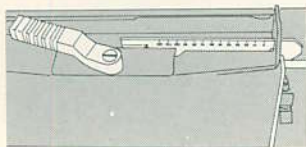
# Transporting the Machine

1. Open the shot-guard cover. Empty it and clean it carefully.



2. Attach the transport guards.  
Fit the accompanying ruler firmly in the ice skate holder.  
Screw in the transport guards.

**Note** *The machine must not be transported without the transport guards.*



Move the machine, preferably, in its original package; or, use another strong, sturdy package.

## 8. IMPORTANT SAFEGUARDS

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*The following advisory warnings should be read and utilized whenever the machine is in operation*

1.

### **Grounding instructions**

The sharpener is equipped with an approved 3-conductor cord and a 3-prong grounding type plug to fit the proper grounding type receptacle. The green (or green and yellow) conductor in the cord is the grounding wire. Never connect the green (or green and yellow) wire to a live terminal. Replace or repair a damaged or worn cord immediately.

2.

### **Avoid dangerous environment**

Do not use sharpeners in damp or wet locations or expose them to rain. Keep work area well lighted.

3.

### **Do not operate sharpener in gaseous or explosive atmosphere**

Grinding sparks could ignite the flammable substances.

4.

### **Keep guards in place**

and in working order.

5.

### **Keep work area clean**

Cluttered areas and benches invite accidents.

6.

### **Keep children away**

All visitors should be kept a safe distance from work area.

7.

### **Make workshop kidproof**

with padlocks or master switches.

8.

### **Wear proper apparel**

Don't wear loose clothing, gloves, neckties, or jewelry to get caught in moving parts. Non-slip footwear is recommended. Wear protective hair covering to contain long hair.

9.

### **Use safety glasses**

Also, use face or dust mask as cutting operation is dusty.

10.

### **Do not overreach**

Keep proper footing and balance at all times.

11.

### **Use right tool**

Do not force tool or attachment to do a job it was not designed for.

12.

### **Use recommended accessories**

Consult the owner's manual for recommended accessories. The use of improper accessories may cause hazards.

13.

### **Use only wheel hubs furnished with this sharpener.**

## 8. IMPORTANT SAFEGUARDS

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14.

### **Check for damaged parts**

Before use of the sharpener, the grinding wheel, guard, or any other part that could be damaged should be carefully checked to make sure it will operate properly and perform its intended function. Check for alignment of moving parts, breakage of parts, binding of moving parts, mounting, and any other conditions that may affect its operation. A guard or other part that is damaged should be properly repaired or replaced.

15.

### **Replace cracked grinding wheel immediately. Use only manufacturer-approved grinding wheels.**

16.

### **Maintain tools with care**

Keep tools sharp and clean for best and safest performance. Follow instructions for lubricating and changing accessories.

17.

### **Disconnect sharpener before servicing**

when changing accessories such as grinding wheels, diamonds, etc.

18.

### **Avoid unintentional starting**

Make sure switch is in off position before plugging in.

19.

### **Never leave sharpener running unattended**

Turn power off when not in use.

20.

### **Never stand on sharpener**

Serious injury could occur if the sharpener is tipped or if the cutting tool is unintentionally contacted.

21.

### **Do not adjust machine bolts without factory approval.**

22.

### **Know your sharpener**

Read the owner's manual carefully. Know your applications and limitations as well as the specific potential and hazards peculiar to the skate sharpener.

23.

### **Keep fingers away**

Do not touch moving parts when the sharpener is running.

24.

### **Avoid harmful dust**

Always attach a vacuum cleaner to the sharpener or install a protective cover with sufficient suction.

25.

### **Prevent injuries**

The sharpener should always be moved or transported by two people.