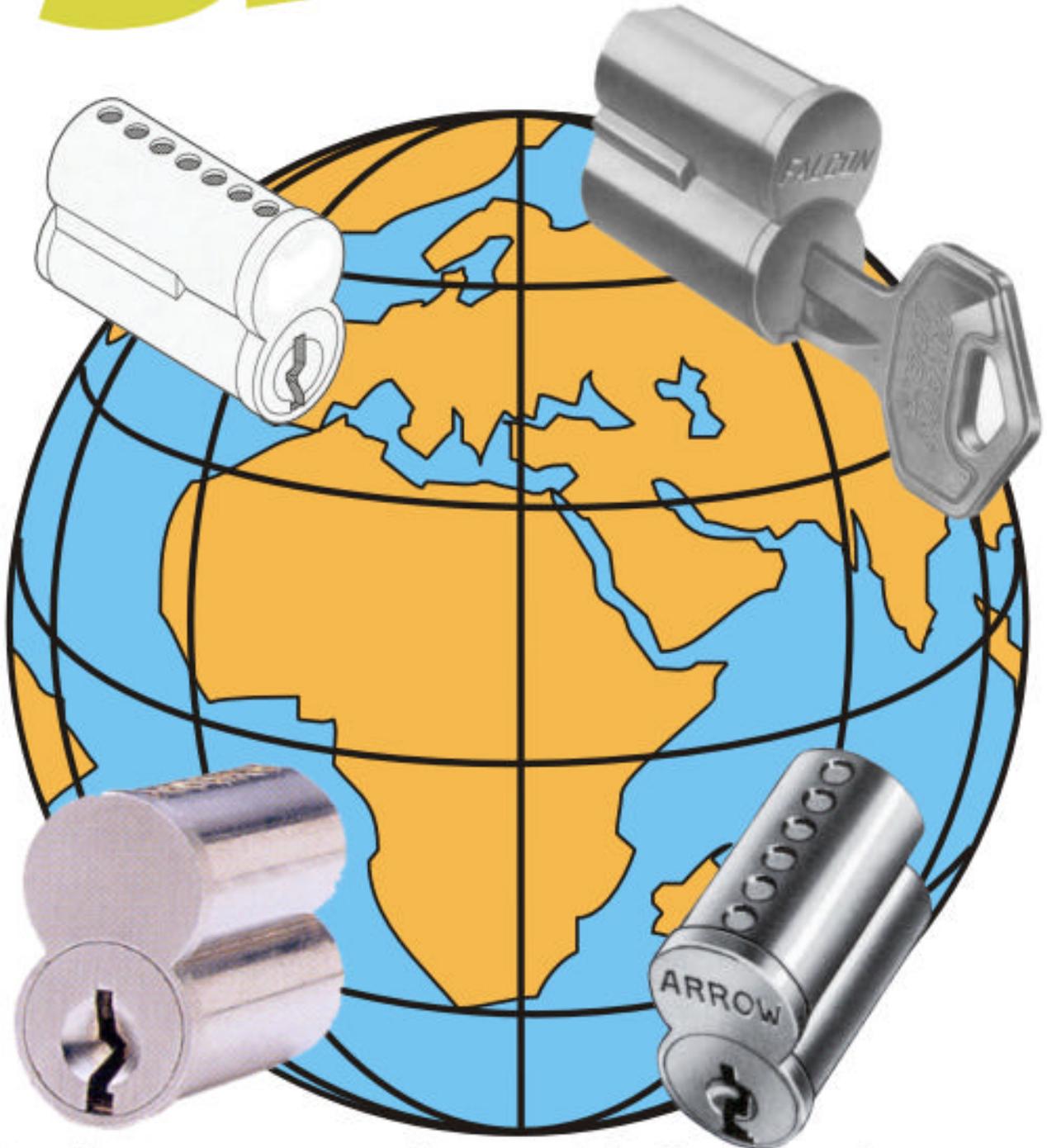


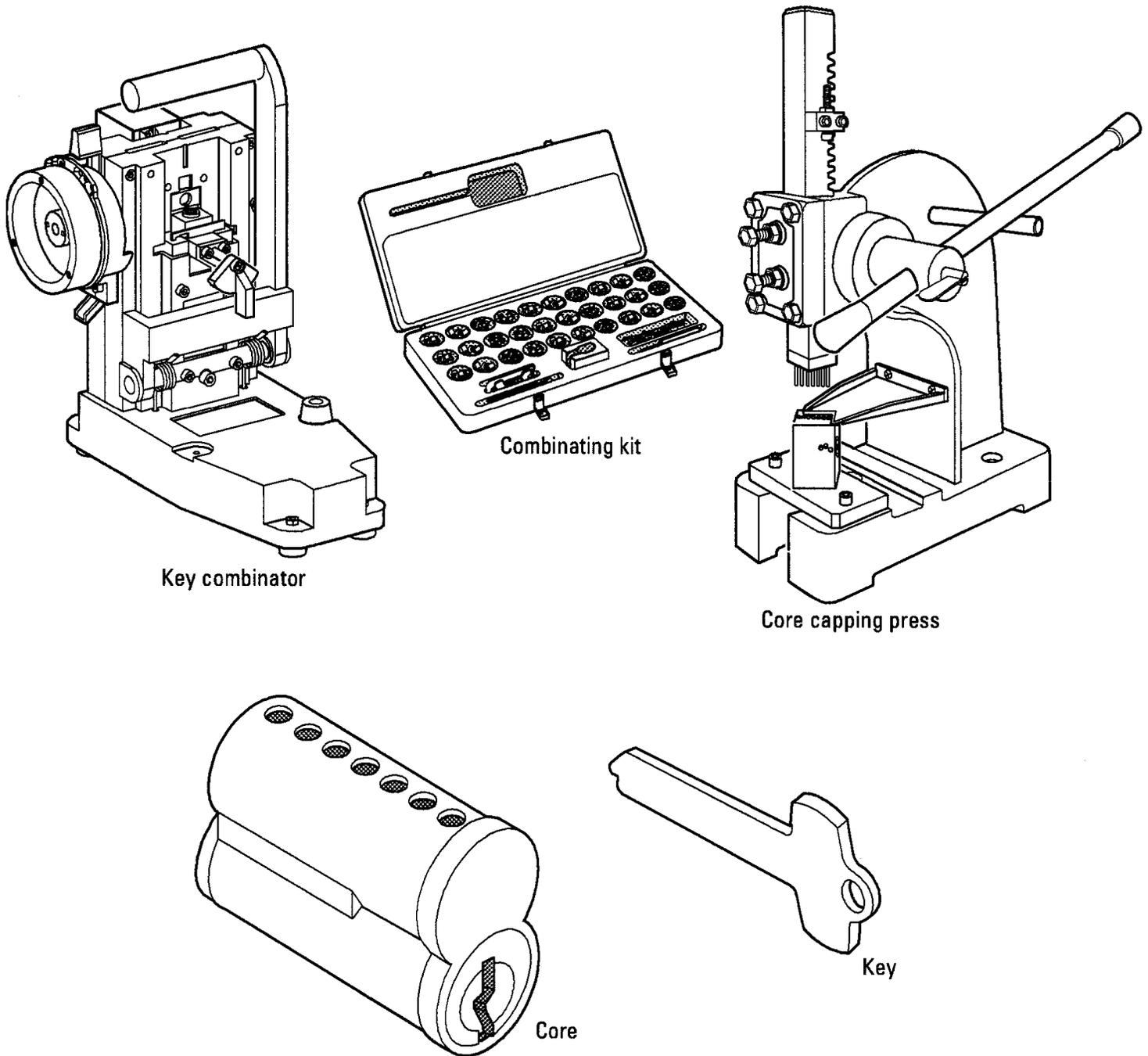
# SFIC



## Small Format Interchangeable Core Service Manual

# GETTING STARTED

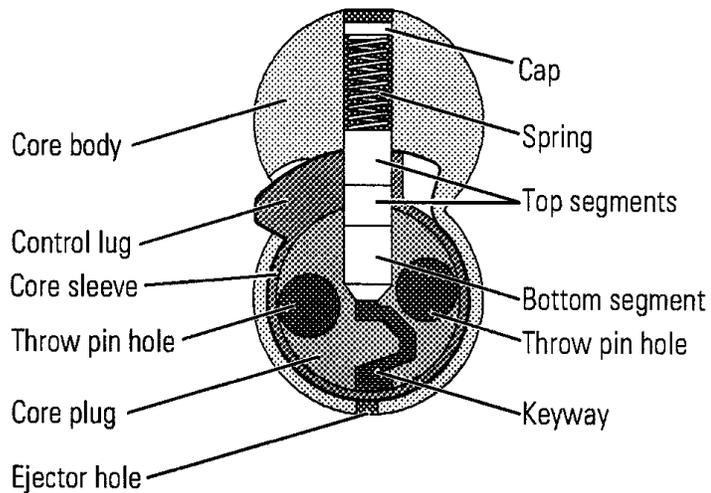
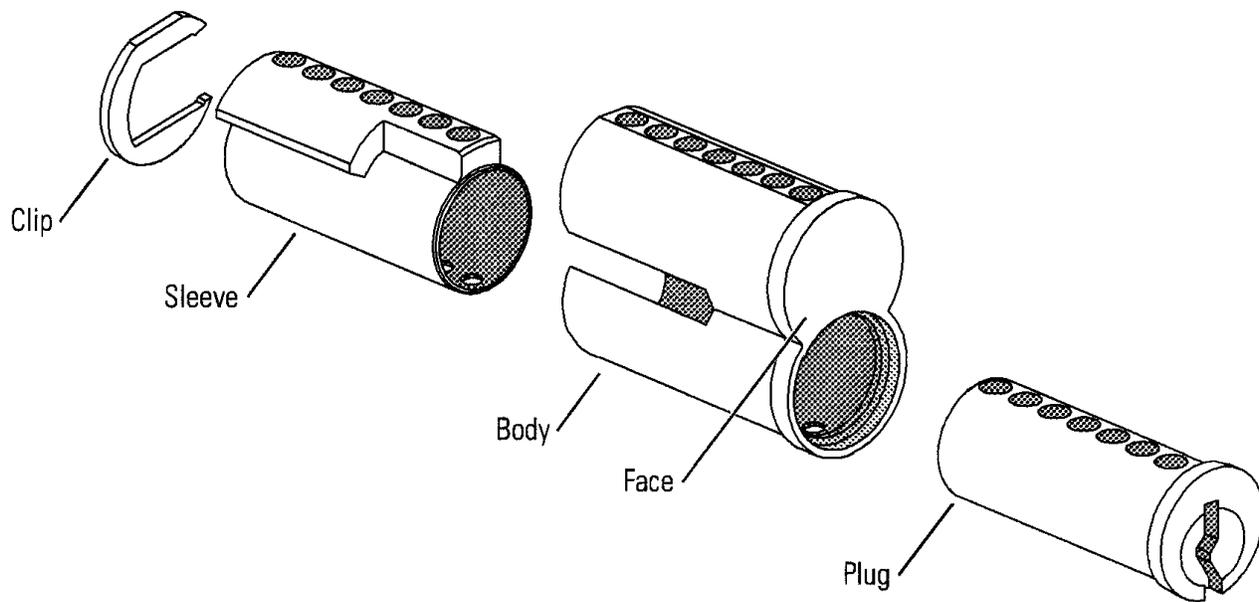
## PRODUCT FAMILY DIAGRAM



# PARTS

The following pages contain descriptions and figures of cores, keys, and tools for servicing them.

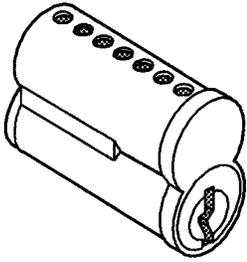
## OVERVIEW OF THE SFIC CORE



# Core Type Description

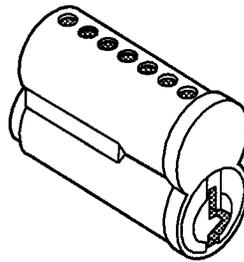
## 1C core

Standard interchangeable core.



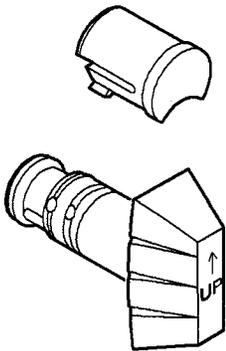
## 1CP core

Premium interchangeable core.



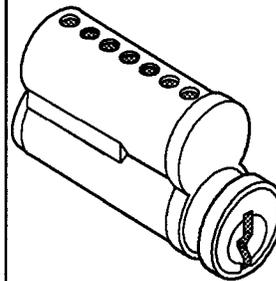
## 1CC0BP core

Black plastic, non-keyed construction core used to secure interior doors at a construction site.



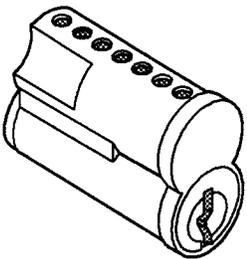
## 2C core

Interchangeable core used in the 8L mailbox lock.



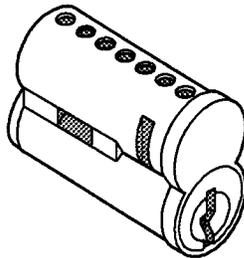
## 3C core

Interchangeable core used with the 8E European lock adaptation.



## 5C core

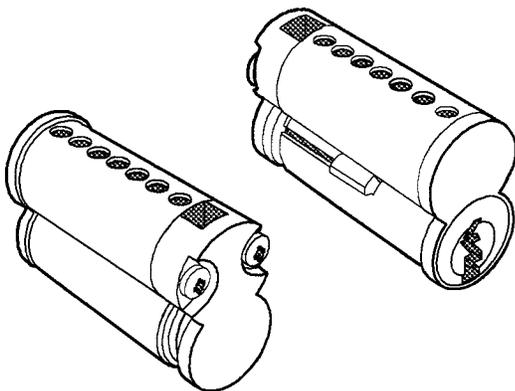
High security interchangeable core used in the 1E cylinder for mortise applications.



## 6C core<sup>a</sup>

Interchangeable core used in the 4S sliding door cylinder lock.

Regardless of the cores' finish, the lost-motion assembly on the back of the core has a stainless steel finish.

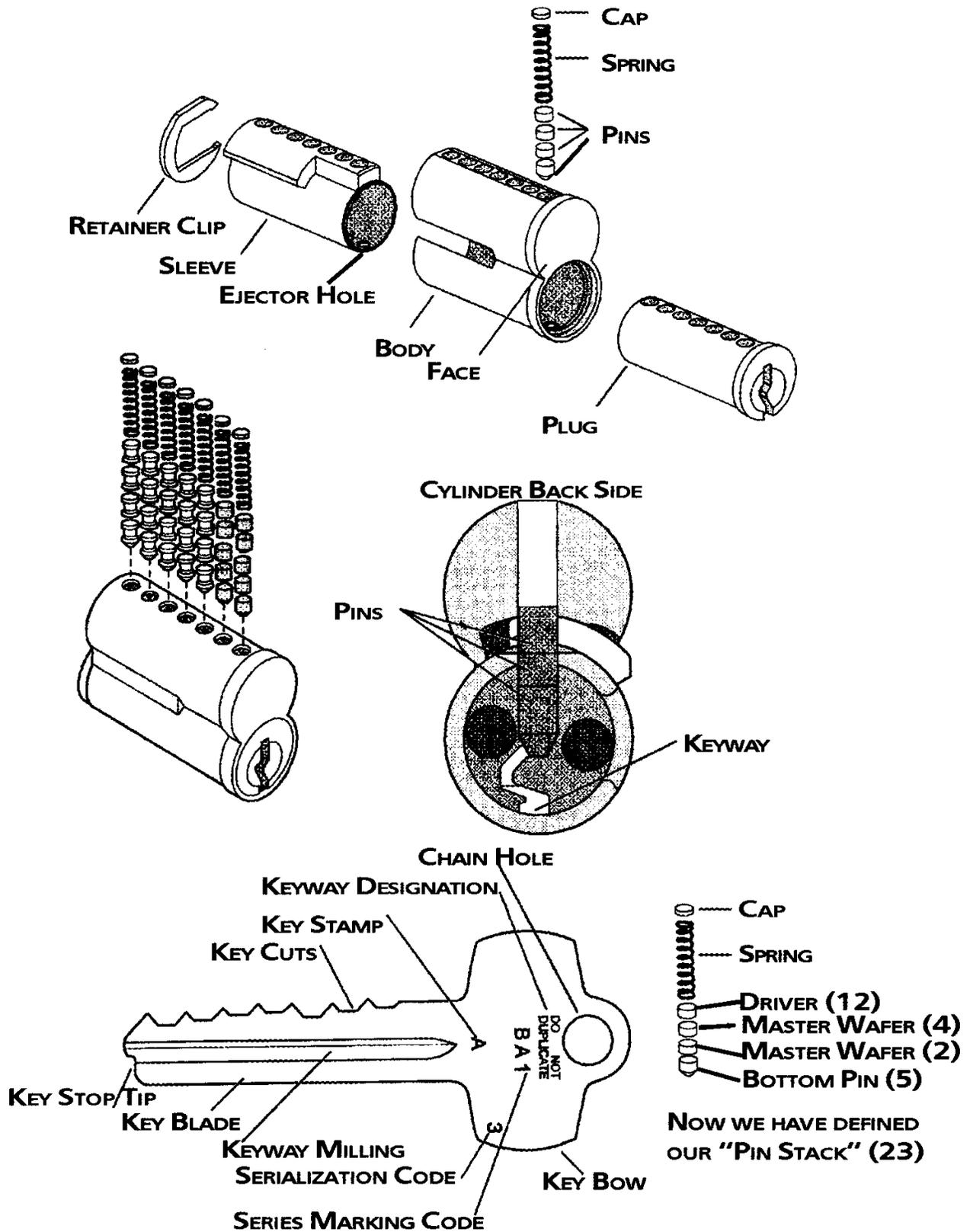


a. The set screw style is not shown.

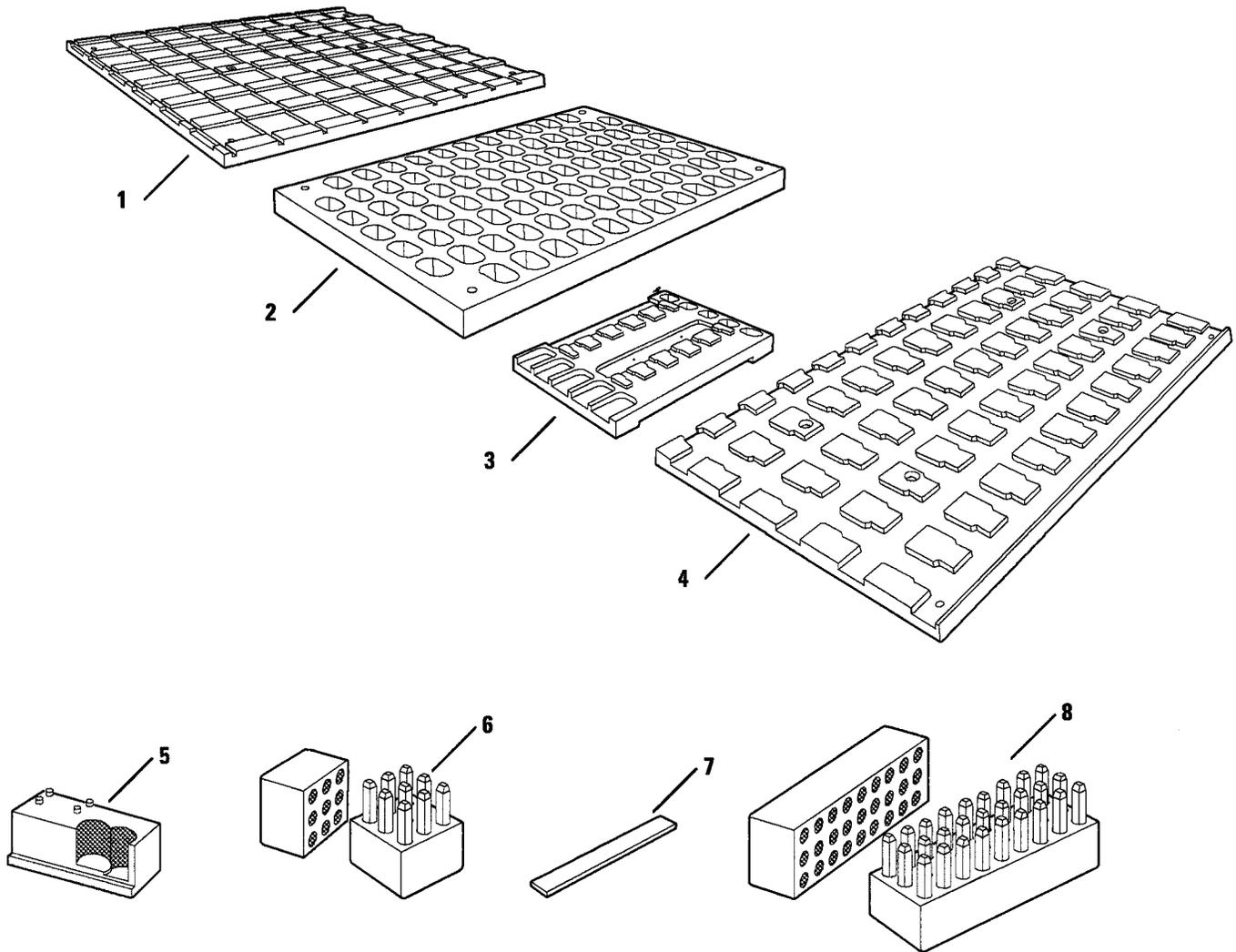
# Core options

## Option Nomenclature Description

<b>Option</b>	<b>Nomenclature</b>	<b>Description</b>
Pick & Drill Resistant	B	Provides enhanced resistance to picking and drilling the core. Hardened ball bearings are used in the throw pin holes and hardened stainless steel segments are used as the top and bottom segments in the first two barrels of the core. Spooled segments are used as the top and bottom segments in each remaining barrel of the core.
Dust Cover	C	Prevents the keyway from accumulating dust and dirt. Stainless steel spring-loaded dust cover is installed over the keyway. Note: If the core is housed in a cylinder, use the cylinder dust cover instead of the core dust cover for maximum protection.
Drill Resistant	D	Provides enhanced resistance to drilling the core. Hardened ball bearings are used in the throw pin holes and hardened stainless steel segments are used as the top and bottom segments in the first two barrels of the core.
Key Trap	K	Eliminates a key from the system by trapping it in the core. This option is useful if a key has been lost, or if someone has a key and will not give it back. When the key is inserted into the core and is turned, the key is trapped in the core. The key cannot be returned vertically nor withdrawn from the core. The core and trapped key must be drilled out of the lock. This special core is modified at the factory to match the key that you want to trap.
Pick Resistant	P	Provides enhanced resistance to picking the core. Spooled segments are used as the top and bottom segments in each barrel of the core.
Set Screw (for 6c core only)	S	Alternate design of the 6C core used in the 4S sliding door cylinder lock. A setscrew is used to hold the core in the lock.
Key Retained (for 6c core only)	T	Provides an extra measure of security by trapping the key in the core while the core is unlocked. The core stays locked unless the key is left in it. A sleeve without a slot is used to hold the key in the core.
Wear Resistant	W	Provides longer life for cores in high traffic areas. Hardened stainless steel segments are used as the bottom segments in each barrel of the core.



The following tools are used for stamping cores and keys in your system.



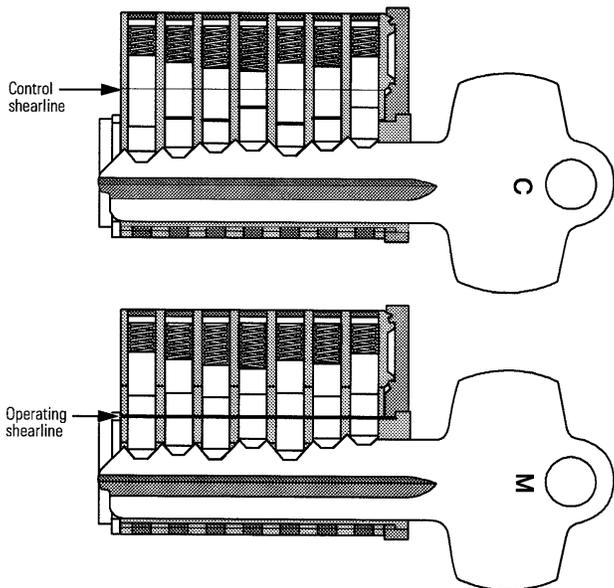
# SERVICING AND TROUBLESHOOTING

This chapter contains instructions for servicing components and troubleshooting common problems

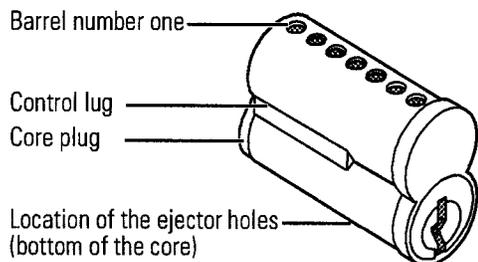
## PLACING PIN SEGMENTS, SPRINGS, AND CAPS IN A CORE

### Overview of how a key works in the core

SFIC cores have two shearlines. The upper, or control, shearline lets you remove the core from the door. The lower, or operating, shearline lets you operate the key in the lock.



**Loading the core** To determine the specific sequence of segments to place in each core, please refer to the *Masterkey Code Sheet* and the *Combinating*



1. Before you begin, identify the parts of the core you will be working with.

2. Insert the ejector pin into the notch on the back of the sleeve and push the control lug into the thrown (extended) position. Remove the ejector pin from the notch.

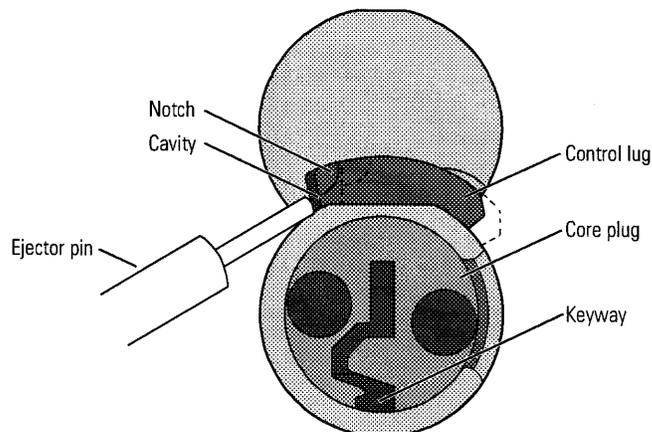
3. Insert the ejector pin into the cavity between the lug and core body to hold the lug in the thrown position. Use your thumb and forefinger to rotate the core plug until the keyway is straight up and down, and the bottom of the keyway is in the six o'clock position. Remove the ejector pin from the cavity.

4. Insert the ejector pin into barrel number seven to ensure that the barrels stay aligned. Leave the ejector pin inserted while you perform the next step.

5. Use your combinating instruction sheet to determine what segments are required for barrel number one. Insert the bottom segment, beveled end down, into barrel number one.

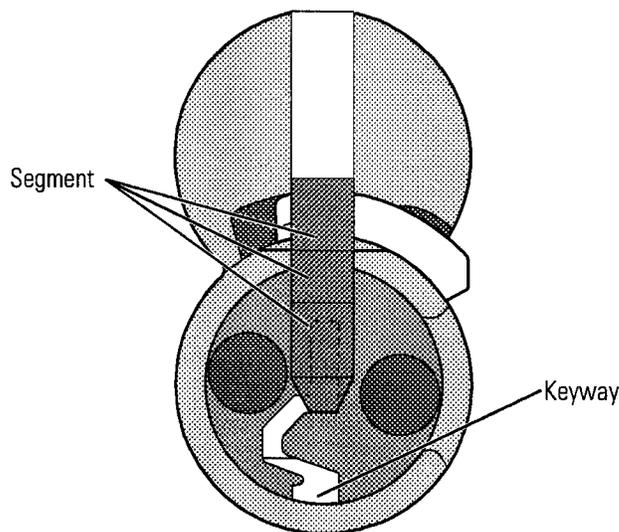
6. Remove the ejector pin from barrel number seven and use it to tap down the segment until it seats at the bottom of the barrel. You should see the segment protruding into the keyway.

7. Insert the next required segment into barrel number one. Use the ejector pin to tap down the segment until it is seated.



8. Repeat step 5 through step 7 until all of the required segments are loaded into all of the barrels.

9. Insert the stop pin into the appropriate hole in the side of the capping block to align the core barrels with the holes in the capping block.

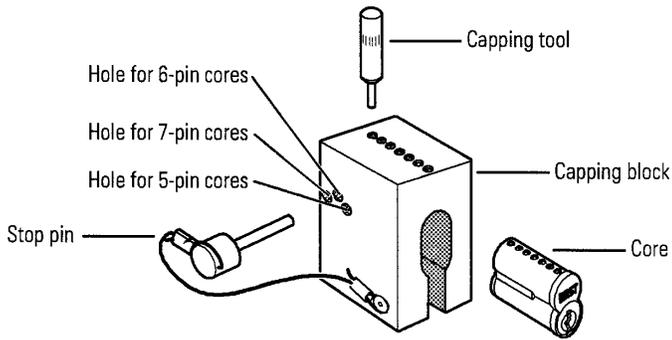


10. Insert the core into the capping block.

11. Insert a spring into barrel number one. Place a cap over the barrel.

**Note:** Do not cut the segment springs and insert an extra cap.

12. Insert the capping tool into barrel number one. Use a hammer to tap the capping tool and drive down the cap until the bottom of the capping tool hits the top of the capping block.

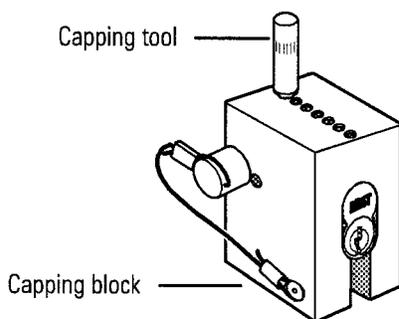
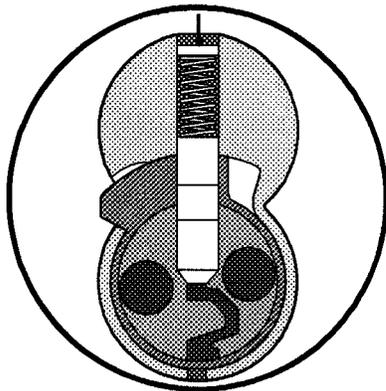


13. Repeat step 11 and step 12 until all of the barrels are capped.

14. Test all keys, including the control, grandmaster, and operating keys, in the core to make sure that each barrel is loaded correctly.

**Note:** If a barrel is not loaded correctly, insert the ejector pin through the ejector holes and tap out the segments, spring, and cap. Discard the used segments, spring, and cap, and reload the barrel.

*Drive cap to this depth. (.025 to .040 inches)*



### Special guidelines

When stamping and loading the core, follow the guidelines below.

\_ If the core is not operating smoothly while you are loading it, do not tap the core against a metallic block. Use a block made of nylon or an equivalent material.

\_ Do not use a metal-headed hammer on cores. Use a plastic-headed hammer only.

\_ Do not use excessive force to stamp core markings on the side of cores. Excessive force may cause the barrel opening to close slightly.

\_ Do not stamp the core on the bottom lobe.

\_ Do not enlarge segment holes. This may cause problems with segment capping

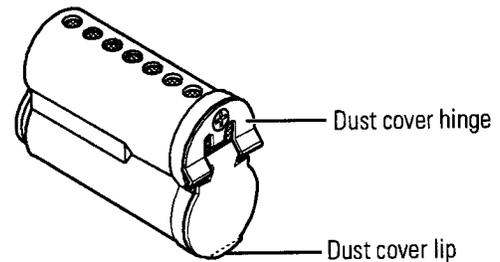
### Checking a core for proper operation

Periodically test all of your keys, including the control, grandmaster, and operating keys in the core to make sure that the core is operating properly. Insert a key in the core. If you can insert, turn, and remove the key easily, the core and key are working properly.

### REPLACING A DUST COVER ASSEMBLY

1. Unscrew the screw and remove the dust cover and dust cover hinge.

2. Place the dust cover over the keyhole in the core so that the lip faces away from the core. Place the dust cover hinge on the face of the core with the prongs covering the dust cover. Install the screw.



### LUBRICATING A CORE

Create a preventive maintenance plan that includes lubricating the core. To extend the life of the core, lubricate it regularly. Powdered graphite is the SFIC choice for lubrication; LPS spray is also used.

#### Caution

*Do not lubricate a core with oil. Doing so will attract dirt.*

#### For powdered graphite lubrication:

1. Remove the core from the lock.
2. Dip a key in graphite. With the core inverted, insert the key into the keyhole and remove it; repeat several times, allowing the graphite to penetrate the barrels. *OR* With the core inverted, spray graphite into the keyhole. Insert the key into the keyhole and remove it; repeat several times, allowing the graphite to penetrate the barrels.

#### For LPS lubrication:

1. Remove the core from the lock.
2. Spray compressed air or LPS lubricant into the core to clean out all of the existing lubricant.
3. With the core inverted, spray the lubricant into the key opening, allowing the spray to penetrate the barrels.

#### Caution

*Do not mix graphite with LPS lubricant..*

### THAWING A CORE

#### Caution

*Do not heat the core with a propane torch. This will cause internal damage and possibly cause the core to become inoperable.* If the core is frozen, try the following techniques to thaw it.

\_ Spray LPS lubricant into the key opening to reduce the moisture inside the core.

\_ Heat the key and insert it into the core.

\_ Spray a commercial lock antifreeze or ice dissolver into the core..

## TROUBLESHOOTING

This table summarizes the possible causes for the most common core and key problems. The causes are listed in the order of likelihood. (The most likely cause is first, and so forth.)

<b>You notice...</b>	<b>Possible Causes Include</b>	<b>You Should,...</b>
It is difficult to insert or remove the key.	a. Key's keyway is not compatible with the core.	a. Look at the end of the key and the keyway of the core. If the profiles do not match, check your <i>Masterkey Specification</i> to see what type of keyway must be used with the core.
	b. Key is damaged.	b. Check the key to see whether it has been damaged. If it has, replace the key.
	c. There is foreign material on the key or in keyway of the core.	c. Check the key and the keyway of the core for foreign material. If there is foreign material, remove it with compressed air or LPS lubricant.
	d. Keyway of the core has been damaged.	d. Check the keyway of the core for damage. If it is damaged, contact your SFIC Representative.
	e. Barrels of the core are not loaded correctly.	e1. Check inside the keyway to see whether the ends of the bottom segments that protrude into the keyway are flat or beveled. If any of the bottom segments appear to be inserted incorrectly, reload that barrel with new segments, spring, and cap. Make sure the beveled end of the bottom segment is inserted first into the barrel.  e2. Perform the thumb check procedure to see whether the height of any segment stack varies.  e3. If the problem still is not solved, check the <i>Masterkey Specification</i> for errors. Reload the core and cut new keys as necessary.
	f. Caps are inserted too deeply into the barrels.	f. From the top of the core, look into the barrels, or use a depth gauge to see whether one or more caps is inserted more deeply into the barrel. (The correct cap depth is .025 to .040 inches from the top of the core.) If so, reload the barrel with new segments, spring, and cap
Key does not rotate the core plug or control lug.	a. Key is cut improperly.	a. Use the key cut indicator to determine whether the key was cut correctly. If the key cuts are not correct, cut a new key.
	b. Barrels of the core are not loaded correctly.	b. Reload the core with new segments, springs, and caps. If the key still does not rotate, check the <i>Masterkey Specification</i> for errors.
	c. Key combinator needs to be recalibrated.	c. If you cut a new key and you are still having the problem, the Key Combinator may need to be recalibrated.
Key does not rotate smoothly.	a. Key is cut improperly.	a. Use the key cut indicator to determine whether the key was cut correctly. If the key cuts are not correct, cut a new key.
	b. Barrels of the core are not loaded correctly.	b1. Check inside the keyway to see whether the ends of the bottom segments that protrude into the keyway are flat or beveled. If any of the bottom segments appear to be b1. Check inside the keyway to see whether the ends of the bottom segments that protrude into the keyway are flat or beveled. If any of the bottom segments appear to be inserted incorrectly, reload that barrel with new segments, spring, and cap. Make sure the

beveled end of the bottom segment is inserted first into the barrel.

b2. Perform the thumb check procedure to see whether the height of any segment stack varies.

b3. If the problem still is not solved, check the *Masterkey Specification* for errors. Reload the core and cut new keys as necessary.

c. Key combinator needs to be recalibrated.

c. If you cut a new key and you are still having the problem, the Key Combinator may need to be recalibrated.

Core does not insert into cylinder/receptacle

a. Core lug is not fully retracted.

a. Check behind the lug for any foreign material. Clean it as necessary.

b. Throw pins inside the receptacle are not aligned with the holes in the core.

b. Check to see whether the throw pins are out of alignment. Use a screwdriver to align the throw pins with the throw pin holes in the core.

c. There is foreign material in the cylinder/receptacle.

c. Check the cylinder/receptacle for foreign material. Clean it as necessary.

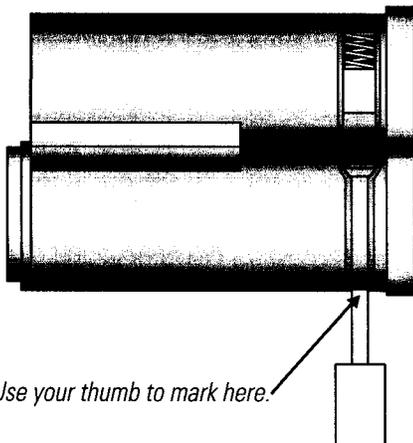
d. For mortise locks only, the cylinder set screw is installed too tightly.

Remove the mortise case faceplate and loosen the cylinder set screw.

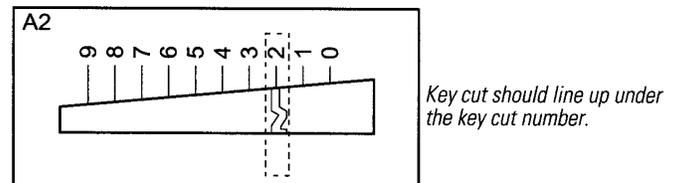
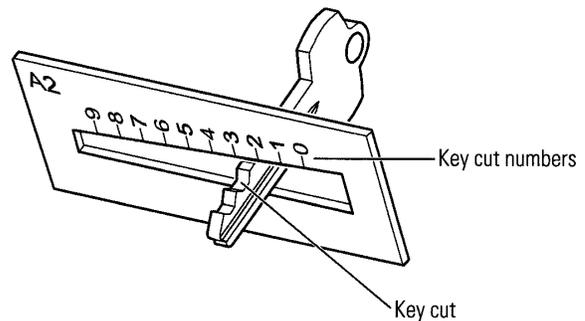
## Performing the thumb check procedure

Perform the following steps to check each barrel of the core to make sure that the segment stacks are of equal height.

1. Insert the ejector pin into the number one ejector hole.
2. Use your thumb to mark the depth on the ejector pin. Keep your thumb in place.
3. Insert the pin into the other ejector holes. If the segment stack height varies, use the ejector pin to force out the segments, springs, and caps of the barrels that are incorrectly loaded. Discard the used segments, springs, and caps. Reload the barrels with new segments, springs, and caps.



2. Slide the key until it contacts the indicator at the top and bottom. Read the key cut number that aligns with the position of the key.
3. Make sure that the key cut corresponds to the key cut for that position listed on your *Masterkey Specification*. If the key cut does not match what is listed, cut a new key.
4. Repeat step 1 through step 3 for each key cut on your key.



## Using the key cut indicator

1. Insert your key into the key cut indicator that is appropriate for your keying system, with the key cuts facing the numbers on the key cut indicator.

# GLOSSARY

<b>Combinating</b>	The process of determining the combination of the length of segments used and the order they are loaded into the barrels of a core. Also, the process of making the cuts of different depths in a key blade that let it operate or remove a corresponding core.
<b>Control key</b>	A key that can insert or remove any core in a system.
<b>Grandmaster key</b>	A key that can unlock any lock in a system.
<b>Interchangeable core</b>	A figure-8 shaped device that contains all mechanical parts for a master keyed system. The interchangeable core can be removed by a special control key and can be recombined without disassembling the lock.
<b>Key blank</b>	A key that has no key cuts.
<b>Key cut</b>	A notch in a key.
<b>Keyway</b>	The slot in the core used to receive and guide the key. Also, the shape of the key blade determined by the location, length, width, and depth of grooves milled in the key blade.
<b>Loading a core</b>	The process of inserting segments, springs, and caps into each barrel of a core according to predetermined specifications.
<b>Master keying</b>	A method of keying locks that allows a single key to operate any locks, but also allows each lock to be operated by its own key.
<b>Operating key</b>	A key that can unlock a single lock within a system
<b>Shearline</b>	The alignment of segments in the core that is created when a key is inserted. The shearline lets the key operate the core or remove the core from the lock.
<b>Submaster key</b>	A key that can unlock only specified groups of locks within a system.
<b>Thumb check procedure</b>	A series of steps performed to check that the segment stacks are of equal height in each barrel of a core.