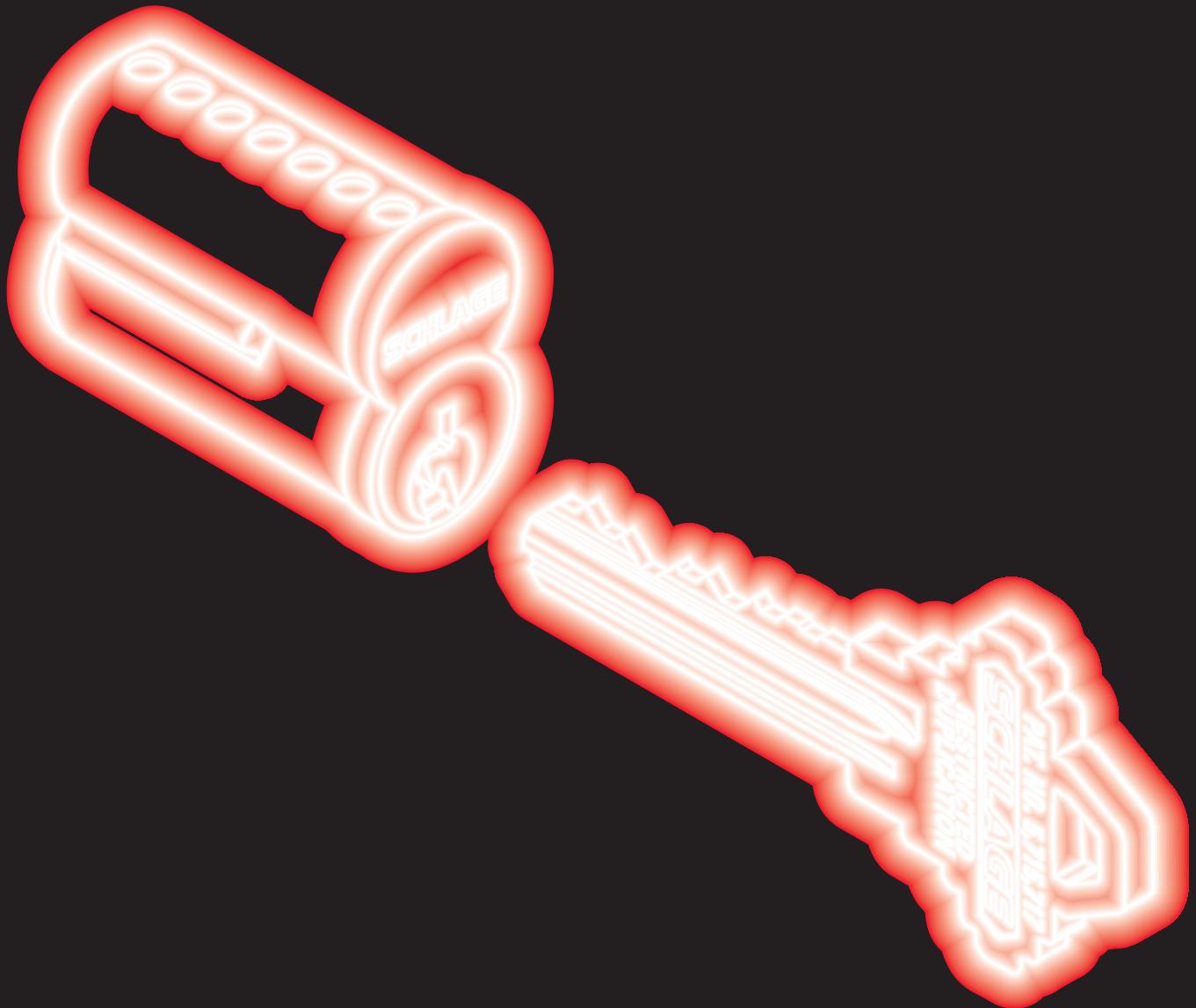


**SCHLAGE®**

# Small Format Interchangeable Core Service Manual



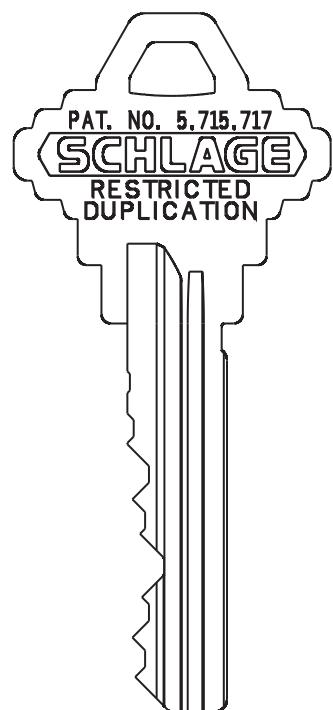
**INGERSOLL-RAND**  
ARCHITECTURAL HARDWARE

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# SFIC SERVICE MANUAL

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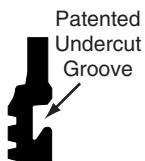


Second Edition - June 2000

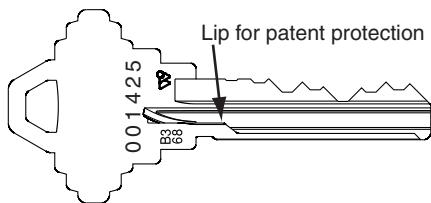
## Schlage® Small Format Cores

### Everest™ Patented Key Control

Most building owners have security problems due to the unauthorized duplication of keys. Schlage's Everest keys are protected by U.S. utility patents 5,715,717 and 5,809,816.



The patented undercut groove requires a secondary milling operation to make the key blank. It is a violation of federal patent law for anyone other than Schlage to manufacture and distribute these blanks. By replacing standard cores with Everest patented key cores, end-users can be assured of a high level of key control.



### Key Control Summary

The keyway used for each job is registered to the end user at the Schlage factory or an authorized Schlage service center. Everest restricted key blanks, cut keys and cores are furnished only through authorized Schlage distributors and then only when the end user's letter of authorization accompanies the purchase order.

Restricted items are drop shipped directly to the end user, or a location specifically authorized by the end user. The drop shipment prevents locksmiths and distributors from having access to keys and cores without the end user's permission.

Schlage also stamps a facility code or locksmith ID number on all keys and blanks to identify where they originated, as a further deterrent to unauthorized key duplication.

### Non-Patented Cores

To support other manufacturers' keying systems, Schlage offers 6 and 7-pin uncombined cores in the ten most popular IC keyways.

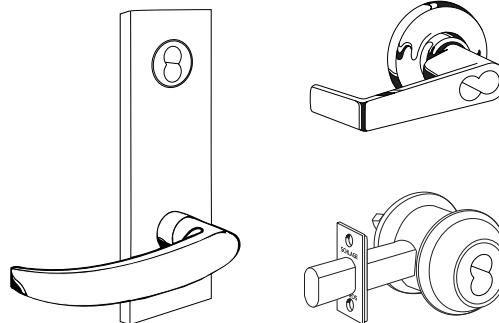


These are fully compatible and interchangeable with keyways of the same letter designations manufactured by Arrow®, Best®, Falcon® and KSP®. Note: Schlage and Arrow suffix the keyway letter with "B" so the Best "A" keyway is ordered as "AB".

Schlage also sells nickel silver key blanks with the Best bow shape for these keyways.

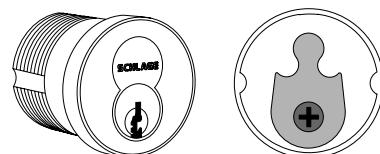
### Locksets

An array of Schlage deadbolts, mortise locks and key-in-lever locksets are now available to accept these cores, as well as other brands of small format cores. Consult Schlage sales literature and your local distributor for the latest offering of functions and finishes.



### Mortise & Rim Cylinders

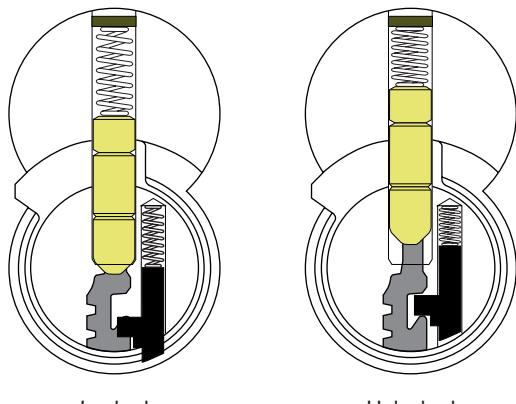
Schlage SFIC mortise cylinder cams are easily changed, as opposed to other brands which are staked on.



## If You Are Familiar With Pinning Best Style Cores

If you are already familiar with combining Best style cores to the A2 System (depths 0 through 9), you will find **no difference** in combining Schlage small format cores. This applies to cores with Best keyways as well as the Everest patented keyway cores.

In patented keyway cores, the blocking pin near the front and to the right of the keyway checks for the lip of material on the side of the key.



This pin does not participate in the combination of the key and it remains safely inside the core during the combining process.

Like other brands of these small format cores, the Schlage core should never be dismantled for combining or decombining.

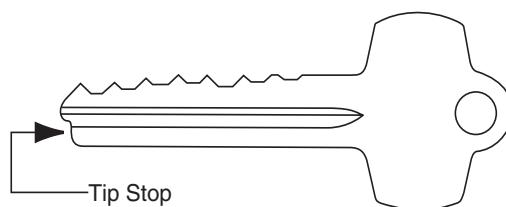
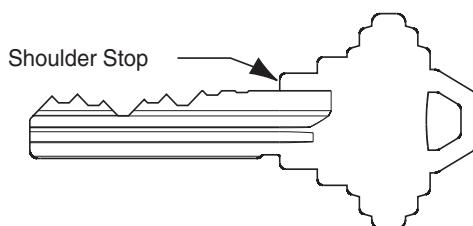
If you already own a different brand of specialized pin kit and tools for Best style cores, you may use them for Schlage cores with the following exceptions and cautions:

1. Do not use Arrow bottom pins because the bottom flat is smaller and may not seat properly on a zero cut when next to a 9.
2. Do not use Kaba Peaks bottom pins, as they are .003" too short for Schlage cores.
3. For security reasons Schlage advises **against** using colored bottom pins. The colors can be read through the keyway with a lock scope, revealing the combination. They are also less resistant to wear than nickel silver bottom pins.
4. Only the original Schlage 40-129 pin kit contains the plug retainer and the blocking pin and its spring. These components normally do not need replacement but the supply may come in handy to repair an occasional vandalized or worn core. These parts may be ordered separately if you use a different brand of pin kit.
5. Due to the location of the blocking pin, the ejector holes in the bottom of Schlage cores are all shifted by .010" toward the back of the core. This may cause problems in certain core decombining fixtures and presses. Using any brand of ejector pin one chamber at a time, however, should pose no problems.

Schlage reserves the right to void the warranty if the core is combined with components which do not conform to our specifications, or if keys are not properly cut.

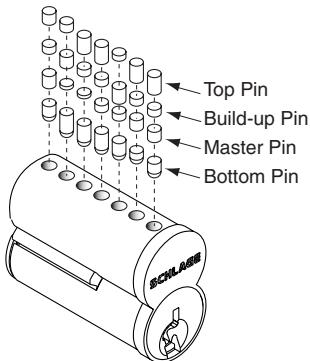
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Schlage keys use a shoulder stop against the plug face. Most other brands of SFIC keys stop at the tip. Punch type machines for other Best style keys will not work for Schlage patented keys and vice-versa.



## If You Are Not Familiar With Best Style Cores

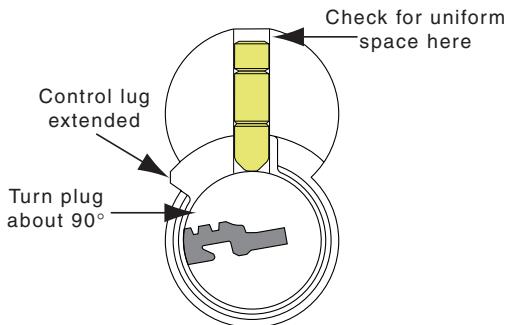
- Never remove the plug! These cores are designed to be top loaded. You will not be able to see any of the pins at the shear line. All combining is done strictly by the numbers. Each pin size is determined with simple addition and subtraction. There is no opportunity for trial-and-error.



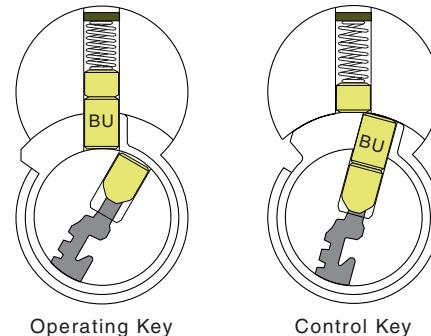
- For all keys which must operate, have the bittings legibly and neatly written. You can get them from the bitting list or by gauging each key individually. Each digit of the control key should be directly over the corresponding digit of the master and change key. With the control key bitting on the top, it is helpful to draw a line under it, in order not to confuse **control** bittings with **operating** bittings during the pin calculation.

Unless the core is cross keyed, you normally only need three key bittings: control, TMK (top master key) and change key. In most properly designed systems, intermediate level master keys will operate automatically. This is because each digit of their bitting is usually contained either in the TMK or the change key. If any master keys must operate which have a digit not already contained in the change or TMK, that digit must be written in the appropriate position and pinned in.

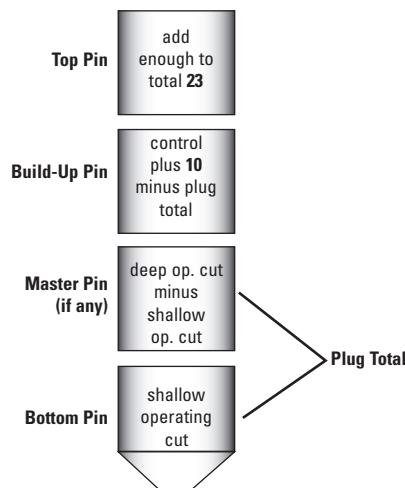
- Insert any key, turn the plug about 90° and remove the key. Be sure the control lug remains extended, leaving a clear passage down the pin chambers to the plug surface.



- There are two shear lines in each chamber; one for the operating keys (change, master, grand master, etc.) and one for the control key. A build-up pin is used to span the distance between the two. Its length changes based on the difference between the control key and the deepest operating key.



The pin stack is illustrated below, together with the addition and/or subtraction necessary to determine each pin. All chambers use exactly the same logic and math. They differ only by the specific bitting number of each key in a given cut position.



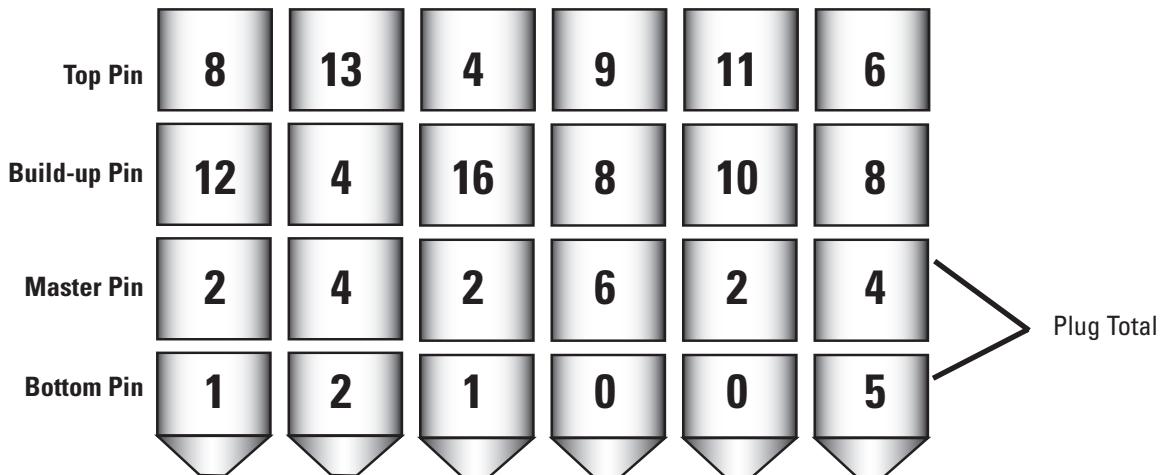
**Memorize:**

$$C_{\text{ontrol}} + 10 - P_{\text{lug total}} = B_{\text{uild-U}_p}$$

$$\text{Total Stack Height} = 23$$

## 6-Pin Combinating Example (Always TIP to BOW!)

5	0	9	4	2	7		Control
3	6	1	6	0	5	A	Grand master
1	2	3	6	0	5	AA	Master
1	2	3	0	2	9	AA1	Change



**Chamber 1:**  
Shallowest *operating cut* is 1  
(= **bottom pin**)  
Deepest minus shallowest is 2  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $5 + 10 - 3 = \underline{12}$   
We now have  $1 + 2 + 12 = 15$   
"units of stuff" loaded.  
**8 (= top pin)** must be added  
to total 23.

**Chamber 3:**  
Shallowest *operating cut* is 1  
(= **bottom pin**)  
Deepest minus shallowest is 2  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $9 + 10 - 3 = \underline{16}$   
We now have  $1 + 2 + 16 = 19$   
"units of stuff" loaded.  
**4 (= top pin)** must be added  
to total 23.

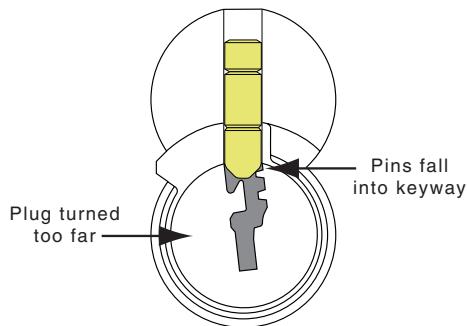
**Chamber 5:**  
Shallowest *operating cut* is 0  
(= **bottom pin**)  
Deepest minus shallowest is 2  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $2 + 10 - 2 = \underline{10}$   
We now have  $0 + 2 + 10 = 12$   
"units of stuff" loaded.  
**11 (= top pin)** must be added  
to total 23.

**Chamber 2:**  
Shallowest *operating cut* is 2  
(= **bottom pin**)  
Deepest minus shallowest is 4  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $0 + 10 - 6 = \underline{4}$   
We now have  $2 + 4 + 4 = 10$   
"units of stuff" loaded.  
**13 (= top pin)** must be added  
to total 23.

**Chamber 4:**  
Shallowest *operating cut* is 0  
(= **bottom pin**)  
Deepest minus shallowest is 6  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $4 + 10 - 6 = \underline{8}$   
We now have  $0 + 6 + 8 = 14$   
"units of stuff" loaded.  
**9 (= top pin)** must be added  
to total 23.

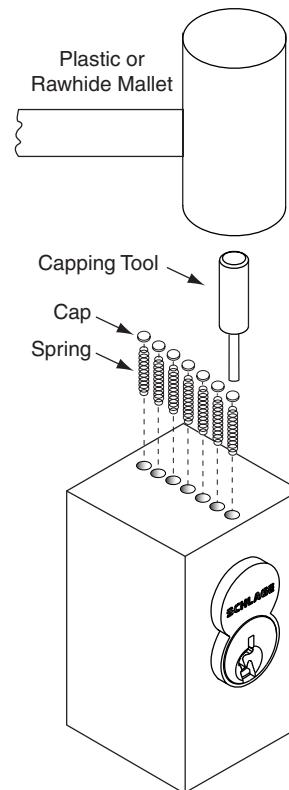
**Chamber 6:**  
Shallowest *operating cut* is 5  
(= **bottom pin**)  
Deepest minus shallowest is 4  
(= **master pin**).  
Formula of  $C + 10 - P = \underline{BU}$ :  
 $7 + 10 - 9 = \underline{8}$   
We now have  $5 + 4 + 8 = 17$   
"units of stuff" loaded.  
**6 (= top pin)** must be added  
to total 23.

5. **Combine one chamber completely before moving on to the next.** Think of each one as a simple math problem which always has the answer of 23. Many beginners try to install all seven bottom pins, then all master pins, then all build-up pins, etc. This method may seem easier but it forces you to think through each "math problem" two or three times, rather than once. Mistakes are more common with this method. You will also never pick up any speed this way and will usually have to write down all the pins before combining the core. Your goal should be to calculate each chamber quickly in your head as you build each stack.
6. In a master keyed core, each chamber normally has four pins. With the plug turned, you can watch the top surface of each pin stack as you complete it. The top surfaces should all line up evenly, about .050" below the top surface of the core. Paying attention to this detail lets you spot a pinning error immediately and correct it before it's too late.
7. With all chambers combined, turn the plug back to the 12 o'clock position so all the pin stacks can fall into place. Caution: The bottom of the Schlage keyway is very wide and open. Do not turn the plug in a direction which would allow the pins to engage in the bottom of the key slot.



8. Add a **very small amount** of dry graphite into each chamber. Do not overdo this or the springs will not have room to compress properly.
9. Cap the core:
  - A) Slide the core into the capping block.
  - B) Install a spring into each chamber and slide a cap on at the top.
  - C) Chamber by chamber, press the capping tool down and strike it sharply with a plastic or rawhide mallet to press the cap all the way in and seal the chamber. **Never use a metal hammer.** It will eventually ruin your capping block and pin.

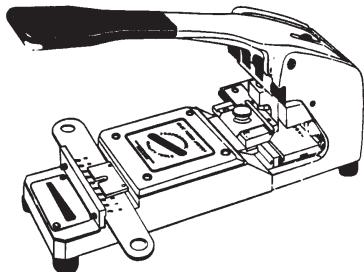
You may prefer to install one cap and drive it into place before installing the next. The jolt from the mallet can cause loose caps to jump out of place.



10. Test all three keys (control, TMK and change key).
11. Spray a small amount of graphite into the keyway and run a key in and out several times to work the graphite through the core. This step is especially important for Schlage patented cores. This is the only way to lubricate the special side pin.

## Cutting Keys

The Schlage 40-071 is a special version of the Blue Punch key machine for the Everest patented SFIC keys. For service on this machine, contact Pro-Lok at (714) 633-0681, fax (714) 633-0470.

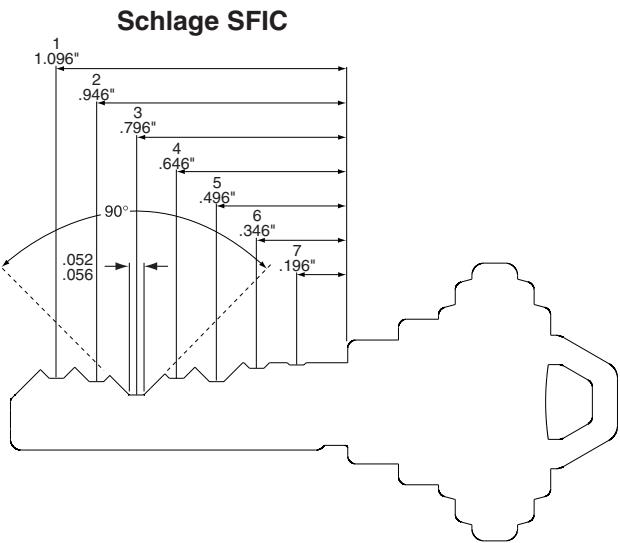


To cut Schlage keys on rotary cutter code machines it may be necessary to modify or replace the vise jaws for reliable gripping. Contact your key machine manufacturer directly.

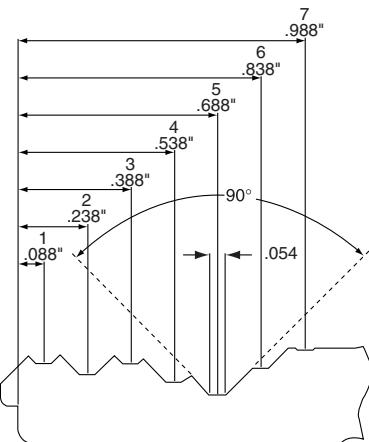
Since the Everest patented core is designed to replace cores by Best, Arrow and others, Schlage's key cuts are read and written TIP to BOW. This is the opposite of other Schlage keys but standard for small format IC.

## Key Bitting Specifications

Depths	
0	.3187"
1	.3062"
2	.2937"
3	.2812"
4	.2687"
5	.2562"
6	.2437"
7	.2312"
8	.2187"
9	.2062"

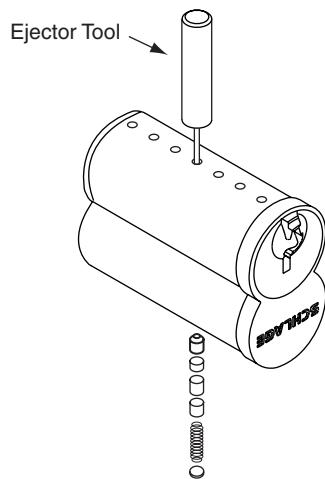


**Best and Falcon IC**



## Troubleshooting

If any key fails to operate the core you've just combined, review the bittings and try to ascertain where the mistake may be. Hold the core upside down and place the ejector tool into the hole of the chamber you want to empty. Using a light plastic mallet, tap the ejector tool until it forces all material out of the pin chamber. Test all key(s) again.



If the problem persists, take your next best guess of where the error is and repeat with another chamber if necessary. When all keys operate, you know that the remaining chambers are combined correctly. Then recombine the empty chambers.

This technique is also used when it is necessary to decombine the core for rekeying.

If you find combining difficult, we recommend completely finishing one chamber at a time, including the capping process, leaving the remaining chambers empty. This allows you to test all keys chamber by chamber until you build up enough accuracy and confidence to handle all chambers at once.

If keys fail to operate smoothly and you are positive you have cut the keys and pinned the core correctly, your key machine may be out of adjustment or pins may have gotten mixed up in your pin kit. The A2 system pin lengths and key bitting specs are shown on these pages. You will need calipers or a micrometer to check your pins and keys against the specs.

Non-patented cores may be combined to A3 or A4 system specifications, but these would be non-Schlage key systems and are not within the scope of this manual.

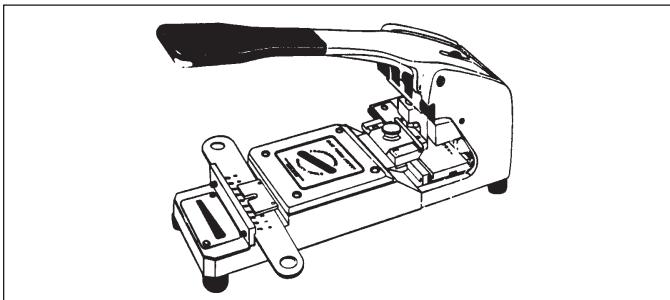
## Pin Lengths

<b>Bottom Pins</b>	
0A	= .110"
1A	= .1225"
2A	= .135"
3A	= .1475"
4A	= .160"
5A	= .1725"
6A	= .185"
7A	= .1975"
8A	= .210"
9A	= .2225"
<b>Master, Build-up and Top Pins</b>	
2B	= .025"
3B	= .0375" *
4B	= .050"
5B	= .0625"
6B	= .075"
7B	= .0875"
8B	= .100"
9B	= .1125"
10B	= .125"
11B	= .1375"
12B	= .150"
13B	= .1625"
14B	= .175"
15B	= .1875" *
16B	= .200"
17B	= .2125" *
18B	= .225"
19B	= .2375" *

\* Not used in pure 2-step progression.

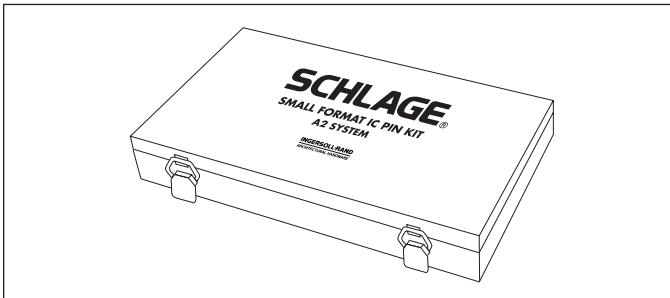
## Service Equipment

Note: If you already own comparable Best style service equipment by other manufacturers you do not need to invest in new equipment other than the key machine for Everest patented keyway cores.



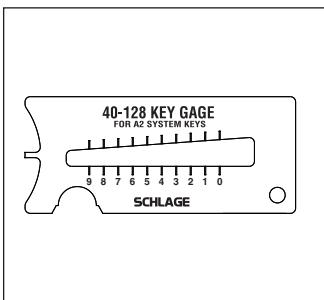
**Key Machine for Everest B Family Keys Only**

40-071



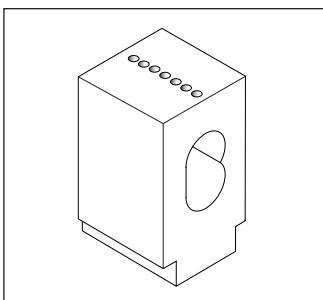
**A2 System Pin Kit**

40-129



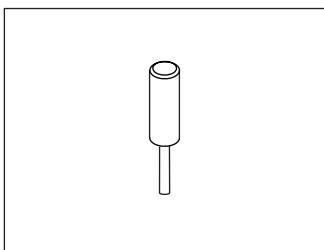
**A2 System Key Gage**

40-128



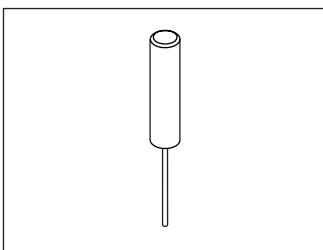
**Capping Block**

40-137



**Capping Pin**

40-138



**Ejector Pin**

40-136

## Pin Kit Refills

(100/pack)

### Bottom Pins

0A = 34-800
1A = 34-801
2A = 34-802
3A = 34-803
4A = 34-804
5A = 34-805
6A = 34-806
7A = 34-807
8A = 34-808
9A = 34-809

### Master, Build-up and Top Pins

2B = 34-902
3B = 34-903 *
4B = 34-904
5B = 34-905
6B = 34-906
7B = 34-907
8B = 34-908
9B = 34-909
10B = 34-910
11B = 34-911
12B = 34-912
13B = 34-913
14B = 34-914
15B = 34-915 *
16B = 34-916
17B = 34-917 *
18B = 34-918
19B = 34-919 *

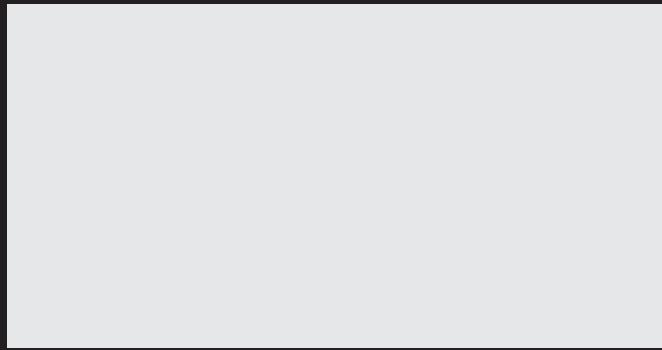
\* Not used in Schlage systems

***Notes***

# **SFIC** SERVICE MANUAL

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## ***Notes***



**Administrative Offices**

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FAX (719) 264-5382

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FAX (800) 452-0663  
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(800) 452-0665

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**INGERSOLL-RAND**  
ARCHITECTURAL HARDWARE

**SCHLAGE**  
Commercial Lock Division