

# C BEGINNER'S CORNER

by  
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## Decoding Keys.

Examples abound of instances where you must **decode** a key in the field or in your shop. At its most basic level you may simply want the **bitting** from a key or you may need to decode a key to determine which **key bitting specification** it uses so that you know how to pin cylinders or cut additional keys to match the manufacturer's requirements. You may also wish to decode multiple keys from a master key system you didn't put together so that it can be serviced. Whatever the case may be, we all must decode keys at some point.

Decoding keys may seem straight forward to any of you that regularly interface with a specific manufacturer's key bitting specification. Schlage's Classic key bitting specifications, found commonly in commercial and residential settings, comes to mind. There are times, however, where we must service keys and/or cylinders belonging to a key bitting specification that we are unfamiliar with. Unless you regularly service Corbin Russwin's various key bitting classes and depth systems, for example, they might cause great confusion without the ability to decode depths from a working key.

With all this in mind, the goal of this article is to show you various methods of decoding a key

and how to utilize the information gathered.

### Locksmith Terms:

#### bitting

1. The number(s) which represent(s) the dimensions of the key
2. The actual cut(s) or combination of a key

#### blind code

A designation, unrelated to the bitting, assigned to a particular key combination for future reference when additional keys or cylinders may be needed

#### code

A designation assigned to a particular key combination for reference when additional keys or cylinders may be needed.

#### decode

To determine a key combination by physical measurement of a key and/or cylinder parts

#### direct code

A designation assigned to a particular key which includes the actual combination of the key

#### effective plug diameter

The dimension obtained by adding the root depth of a key cut to the length of its corresponding

bottom pin which establishes a perfect shear line. This will not necessarily be the same as the actual plug diameter.

#### key bitting specifications

The technical data required to bit a given (family of) key blank(s) to the lock manufacturer's dimensions

#### key gauge

A usually flat device with a cutaway portion indexed with a given set of depth or spacing specifications. It is used to help determine the combination of a key.

#### root depth

The dimension from the bottom of a cut on a key to the bottom of the blade

#### standard key coding system

An industry standard and uniform method of designating all keys and/or cylinders in a master key system. The designation automatically indicates the exact function and keying level of each key and/or cylinder in the system, usually without further explanation.

### Methods

#### Direct and Blind Codes

The simplest method of decoding a key is when a **code**

is stamped on the key bow. This code can be a **direct code**, which is the key's combination, or a **blind code**, which can be utilized to determine the key's combination.

A direct code is essentially what you input into code cutting equipment to produce a key to manufacturer's specifications. Direct codes correspond to bottom pin lengths belonging to the key biting specification (*photo 1*). The benefits of decoding a key using a direct code is that it is quick and straight forward. A direct code will not clue you into the key biting specifications,



**1. A key with a direct code stamped on it.**



**2. A key with a blind code stamped on it.**

however. You must either know that information, know how to derive that information, or know where to find that information to make use of a direct code.

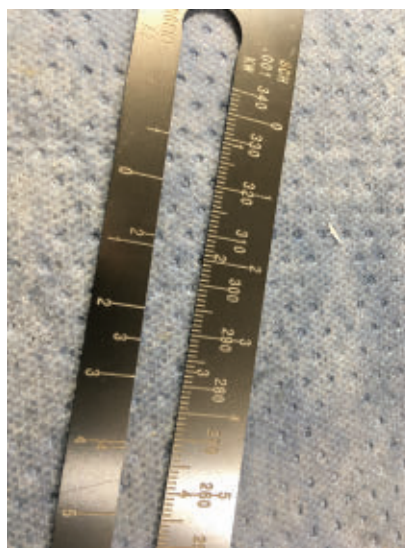
Blind codes are very popular for wafer locks but there are instances of their use in other platforms (*photo 2*). To derive a key's combination from a blind code you must have access to code books, code software, or the like (*photo 3*). You reference blind codes against one of these sources which in turn provides you with the direct code.



**3. Code books and code software assist with decoding blind codes.**



**4. An assortment of key gauges for different manufacturers and key biting specifications.**



**5. A key gauge with measurement marks incorporated into it.**

Nearly all code books and code software contain either full or partial key biting specification information; some even provide the information to produce a key with the combination(s) using various code cutting equipment. This greatly assists decoding as well as the ability to service additional, related keys and/or cylinders.

Blind codes are often alphanumeric although there are times where the blind codes can be numbers only. These numbers cannot be confused with direct

codes, however, because they will nearly always be less than the actual number of cuts found in the key. It's also important to note that you should not

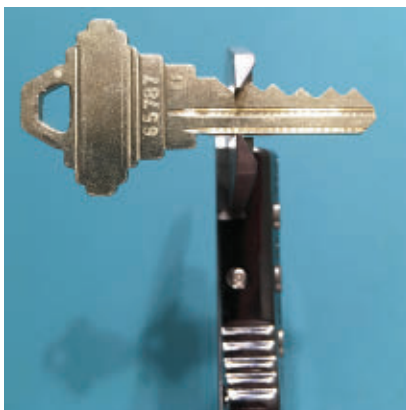
confuse markings from a master key system with blind codes. The standard key coding system, SKCS, must be learned, understood, and practiced so that information stamped on the key isn't confused with a blind code.

## Key Gauge

Keys can also be decoded using a **key gauge**. Key gauges allow you to insert a key into cutaway portion and move the key within the key gauge until it comes to a stop at or near an index marker (*photo 4*). At its most basic level this index marker will be a whole number that corresponds with a depth/cut within that system (*photo 5*). There are key gauges capable of decoding more than cuts in a key, such as angles or Aft and Fore cuts with Medeco keys, depending on the system, but that is a story for another article. There are also key gauges with measurements on them that function much like a micrometer. While not as precise as micrometer



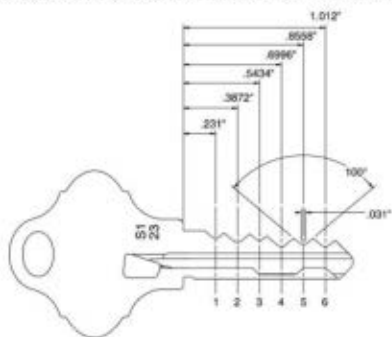
6. A micrometer.



7. A micrometer measuring the root depth of a key cut.

#### Key Bitting Specifications

The following specifications are the same for Schlage Classic™ keys, including Primus®



MACS = 7  
Increment: 0.15°  
Progression: Two Step  
Blade Width: .343°  
Depth Tolerance: + .002° - 0  
Spacing Tolerance: ± .001°

Root Depth	
0	.355°
1	.360°
2	.365°
3	.370°
4	.375°
5	.380°
6	.385°
7	.390°
8	.395°
9	.400°

Cuts are read and written how to tip. The patented Primus side bitting process is done at the Schlage factory. Key blanks have side bitting already milled.

8. Key bitting specifications can greatly assist when decoding keys with a micrometer.

they can be very effective and quick.

You must know the appropriate key gauge for the key; there isn't one key gauge that works for all key bitting specifications and utilizing the wrong key gauge on a key will accomplish nothing more than wasted time.

### Micrometers

Micrometers offer the most accurate method of decoding a key (*photo 6*). Micrometers allow

you to take actual measurements of the key, usually with accuracy  $\pm .001"$ , regardless of the key blank or the key bitting specification. This information can then be used to determine the key bitting specifications out right.

The process to decode using a micrometer is rather straight forward. In fact, there is a formula for this process that you should commit to memory: **Effective Plug Diameter – Root Depth = Bottom Pin Length.**

The effective plug diameter varies by manufacturer but this information is readily available. If you utilize universal LAB pin kits this measurement is listed on each pinning chart. LAB labels this measurement as E.D., which stands for effective diameter. It should be noted and stressed that effective plug diameter is not the same as the actual plug diameter itself.

The effective plug diameter accounts for tolerances, plug diameter does not. Avoid confusion by also committing this to memory.

The root depth is what is measured with the micrometer.

The root depth is amount of material, for lack of better words, between the bottom of the key blade and the bottom of the key cut (*photo 7*). By taking this measurement and subtracting it from the effective plug diameter, or what is needed to create the shearline, we are determining the correct length of the bottom pin. All measurements are taken within a thousand of an inch so you will need to compare the results of this formula against the

manufacturer's key bitting specification to determine the bottom pin/cut assigned to it. Bottom pins correspond to the cut, which simplifies things for everyone involved. For example, if your formula produces a difference of .270" and it is the Schlage classic key bitting specification then you can safely assume you have a 7 cut which utilizes a 7 bottom pin.

Measuring with a micrometer and comparing, or even deriving, is nearly always slower than other decoding methods but it is, without a doubt, the most accurate and fool proof method (*photo 8*). An added benefit of a micrometer is that they are multipurpose. You can use micrometers to measure other things, such as pins. They are also very helpful when calibrating key machines as they can provide precise measurements throughout the process.

### Visual Decoding

Once you become very proficient with a key bitting specification or specifications, you can begin to visually decode keys. This process allows you to determine key cuts by using visual clues of the key. It takes some skill to become accurate with it but if you are become good at it, and the key is accurate, then you can decode keys almost as fast as if it were a direct code.

### Conclusion

I utilize all options and I would advise you to as well. Keep key gauges and a micrometer on the truck and in the shop. Make sure you have access to code books or software. The situations at hand will determine the best, or perhaps only, method of decoding. It is a good idea to not only have those methods available to you but also to be proficient at them.