

SIDEWINDER KEY BITTING

★ 2014 EDITION ★

This reference may be used as an aid when duplicating, decoding, and originating keys, as well as understanding master/valet functionality and diagnosing problems associated with worn or badly cut keys. Sidewinder keys may generally be decoded by sight if the general characteristics for the specific key type are understood.

Lishi numbers are listed where applicable, as they have become the common way to refer to a specific key/lock format.

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SIDEWINDER KEY TERMINOLOGY

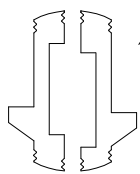
SIDEWINDER KEY - An automotive key of which the bitting is a wavy groove milled in the side of the blade. Note: Use of the term "Sidewinder" dates to the early 1980's when these locks were new to the automotive industry, but the term is a point of contention. Various sources may also use alternate terms such as Track Key, Laser Key or Side Mill Key.

LASER CUT - A method of key bitting that removes the steeples between adjacent cuts.

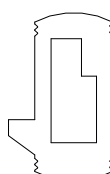
TRACK - The contiguous bitting surface of a sidewinder key.

WEB - The uncut center wall of the blade, expressed as a thickness dimension.

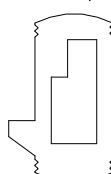
SPLIT WAFER - A wafer tumbler that does not completely surround the key blade, typically with two tumblers for each bitting position. This means each tumbler of a pair contacts alternate tracks of the same space position. ASP refers to these as Half Tumblers.



SPLIT WAFERS

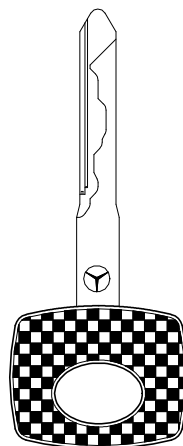


Right

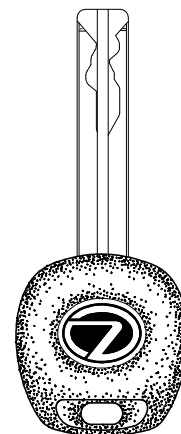


Left

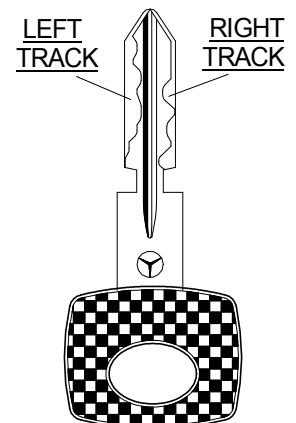
LEFT / RIGHT TRACK - Think of the track designation as the side it is always on with the key clamped in a key machine. Alternately, Instacode refers to these as Side A and Side B.



2-TRACK



4-TRACK
INTERNAL CUT



4-TRACK
EXTERNAL CUT

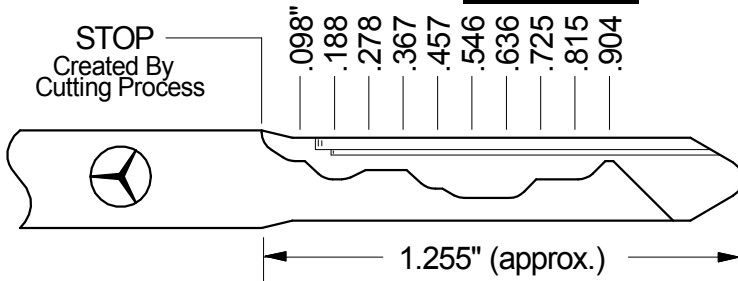
RIGHT / LEFT FORMAT - Full wafers with the tumbler contact opposite the spring tab are most often considered Right format, and tumblers with the contact on the same side of the spring tab are Left format. This convention is found where tumblers are marked R or L by a few manufacturers, and is also in accordance with ASP designations.

Locks produced domestically by Strattec for Ford and GM use opposite designations from the above convention.

SIDEWINDER KEY BITTING

2014 EDITION

MERCEDES 2-Track 10-Cut OLD FORMAT - To '93



NOTE: Keys manufactured by Huf are typically cut .001" shallower.

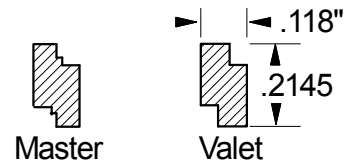
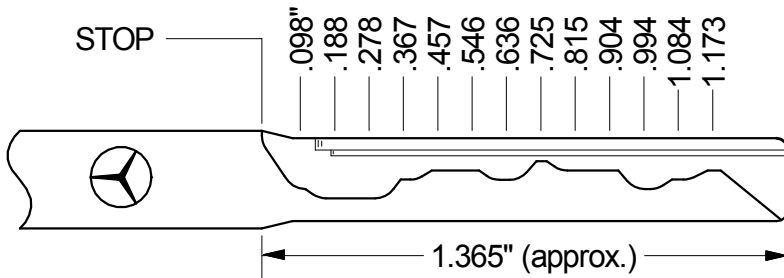
All Mercedes 2-Track keys contain at least two #5 depth cuts.

EXAMPLE
1 3 2 2 4 5 3 3 1

DEPTHS

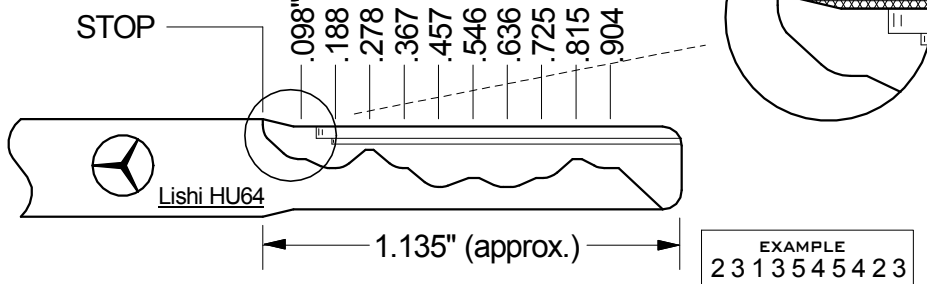
- 1 - .154"
- 2 - .130
- 3 - .106
- 4 - .083
- 5 - .059
- Incr. - .0236
- Web - .040
- MACS - 2

MERCEDES 2-Track 13-Cut Alarm Key '84-'93



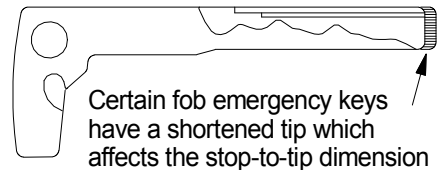
EXAMPLE
4 5 5 3 2 2 3 1 2 2 4 3 2

MERCEDES 2-Track 10-Cut NEW FORMAT - '94+ CHRYSLER Crossfire



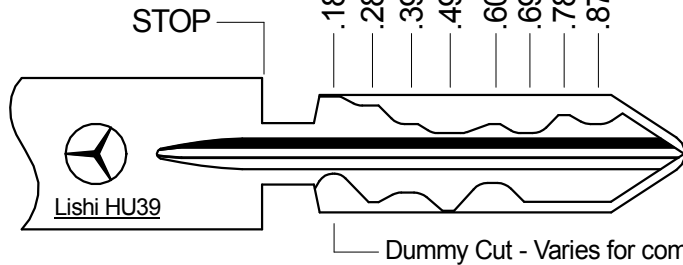
Most 2-Track keys form the stop by the cutting process. On all keys which have a widened neck such as this Mercedes, the stop should be at the point where the transition from wide to narrow begins.

If the stop is formed closer to the tip, the integrity of the stop will be diminished.

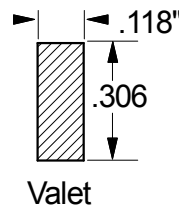
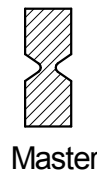


EXAMPLE
2 3 1 3 5 4 5 4 2 3

MERCEDES 4-Track



EXAMPLE
1 2 4 5 4 5 3 4
5 2 3 1 4 2 2 2



DEPTHS

- 1 - .301"
- 2 - .277
- 3 - .253
- 4 - .229
- 5 - .205
- Web - .040
- Incr. - .0236
- MACS - See Text

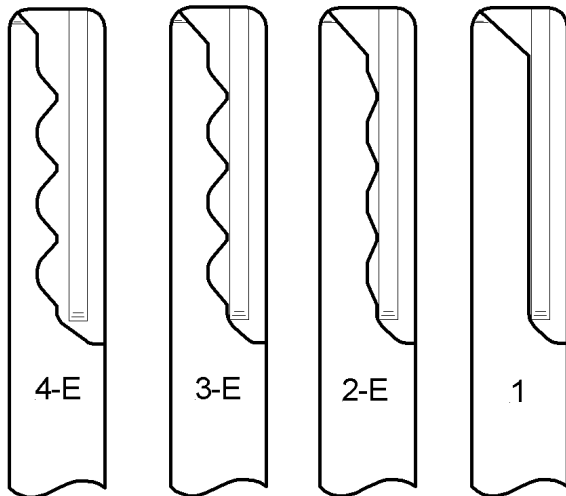
The first position will have only one active cut which may be either on the left or right track depending on the code. The active cut will always be depth #1 thru #4. The opposing cut will always be a dummy #5 depth. #1 depths are not used in positions 5 thru 8. Note the spacing varies which in essence groups the tumblers (positions 1 - 4 and positions 5 - 8). This spacing results in a MACS of 2, except between positions 4 and 5 of which the MACS is 3. MACS does not apply to the dummy cut.

Coding Original Sidewinder Keys

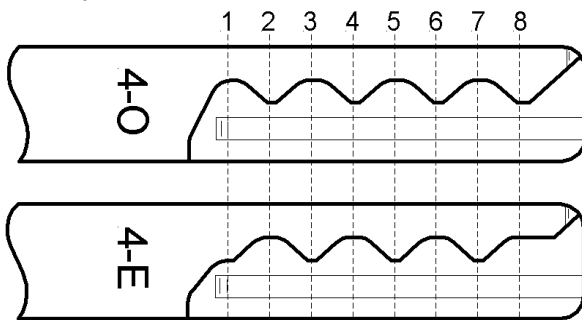
... Using Depth Keys

There are various methods of generating sidewinder keys to a specific combination (or cutting by code). A basic method which can be performed with the common sidewinder duplicating machine is to use depth keys.

Depth keys are a special set of keys in which each key has all the same depth cut, for all positions. A set of keys will consist of one key for each depth cut. This means that if there are four depths used in a particular series, there will be four depth keys in the set.



Each depth key will have the even numbered positions cut on one side of the key, and the odd positions on the opposite side. The reason is to facilitate creation of a proper transition between adjacent cuts when tracing from a key.

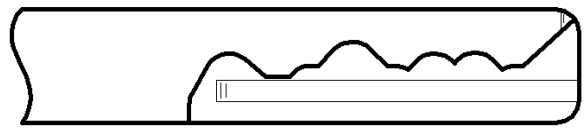


When cutting any sidewinder key, it is important to understand its characteristics such as how the key stops, and the number of depths and spaces. The process of cutting a Volvo 2-track key to combination 31242332 will be presented as an example. It may be advantageous to write the bitting in a way to easily discern the odd and even cuts as such:

○ E ○ E ○ E ○ E
3 1 2 4 2 3 3 2

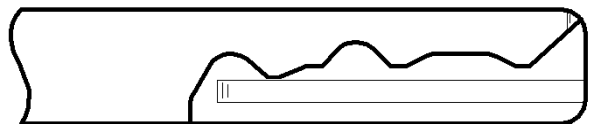
Begin by duplicating the complete # 1 depth key onto the blank. Follow by selecting the next appropriate depth key. With the sample bitting, # 2 depths are used in both odd and even positions. Use the **2-E** side of the depth key and trace the cut for position 8, then turn the depth key over and use the **2-O** side to trace only cuts for positions 3 and 5.

Continue through the sequence for all applicable depths and positions which pertain to the combination you are cutting. When completed, you will have a key which should function, but lacks finished quality.



All sidewinder keys are laser cut (no steeples), which ensures ease of operation and reduces premature wear of the lock tumblers. Therefore, it is highly desirable to optimally contour the bitting. Steeples can be removed from adjacent cuts of the same depth by carefully moving the carriage until the cutter just touches the root of a cut, then cutting away the metal between. Many machines have a feature allowing you to lock the x-axis of the carriage which aids this process.

It is also best to modify some of the bitting angles between adjacent cuts which differ by only one or two depths. Modifying the bitting angle is much more difficult, but can be done with care. The finished key will have a smooth transition between adjacent cuts.



Certain keys may have special considerations when originating. For instance, with internally cut keys such as Lexus, you may need to code the left and right tracks on separate sides of a blank, then trace each track on to another blank for the completed key.

Coding both sides of a key vs. duplicating from the one side created is an issue. Any time you make a duplicate from a duplicate, you are likely to affect accuracy. Know the accuracy of your duplicator and the specifications for the key you are cutting, so that you may compensate if necessary.

Coding Original Sidewinder Keys

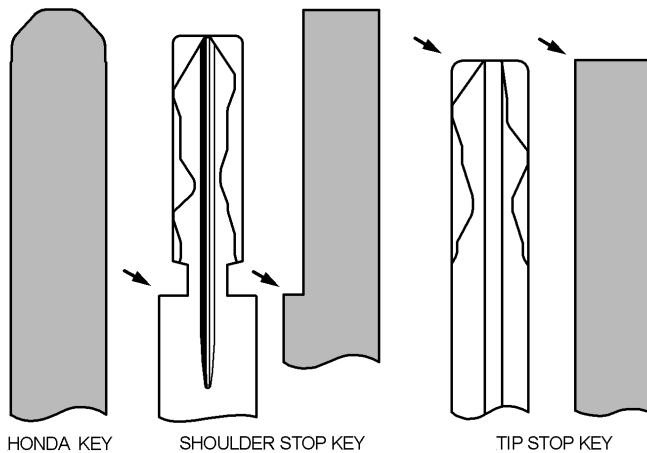
... Using Pattern Keys

Sidewinder keys and locks are generally more sensitive to wear related problems due to their distinct interaction of the key and tumblers. Factory sidewinder keys are always laser cut (no steeples), and have the bitting angle optimized between adjacent cuts to minimize wear.

The classic method of coding original sidewinder keys is to use depth keys, by tracing each cut position from a special set of keys. A problem with originating keys by this method is the lack of control in creating a key with ideal contour between the cuts.

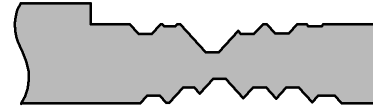
One alternate method of originating is to create a pattern key. A pattern key is made from blank material, and is essentially a silhouette of the bitting for the sidewinder key. Advantages to using the pattern key method are the ability to efficiently remove steeples, achieve optimal bitting angle, and make adjustments to control accuracy. All externally cut 4-track keys may be easily originated with pattern keys. With some exceptions, most other types would need special preparation, therefore this method is not as practical to use.

Once the pattern is made, any number of keys may be traced without affecting accuracy as would be inherent when tracing from a key generated from depth keys.



The Honda sidewinder service key is ideal for making most pattern keys. Begin by cutting to the same height as the blank for the key type you are working with. If you are creating a key for a type which tip stops, then blunt and square the tip of the pattern key. If you are working with a key which uses a shoulder stop, then form that in your pattern. There is no need to create a shoulder on both sides of the pattern, but form the shoulder on the same as the fixed side of the vise of your duplicator (Matrix - left side, Bianchi - right side).

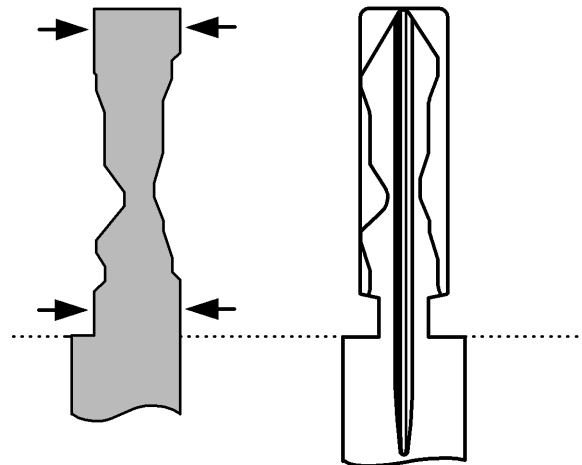
After you have created a blank pattern key to the proper dimensions for the type you are cutting, use the bitting specifications with your code machine to cut the combination you need.



If you cannot laser cut with your code machine, then file the steeples by hand on the pattern. You can also adjust the bitting angle by hand filing between adjacent cuts as necessary.



For proper registration, your pattern must be created in a way so there is full blank height supporting the key in the vise on the fore and aft end of the combination cuts.



Simply duplicate from the pattern to the sidewinder blank. Most keys will require an additional procedure of forming the tip lead-in angle. The easiest way to do this is simply trace the tip area from a factory key. In particular, the Honda key will require cutting a # 1 depth a certain distance uniformly in front of the first cut position (see the bitting specification). The key below illustrates a 'prep key' which may be used for this purpose. It also creates the tip lead-in, and a #5 depth on the left track, fifth position, which is present on all master keys.

