

# 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

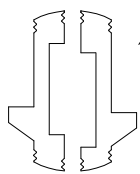
SIDEWINDER KEY - An automotive key of which the bitting is a wavy groove milled in the side of the blade. Note: Use of the term "Sidewinder" dates to the early 1980's when these locks were new to the automotive industry, but the term is a point of contention. Various sources may also use alternate terms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

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

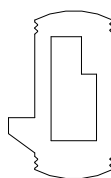
TRACK - The contiguous bitting surface of a sidewinder key.

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

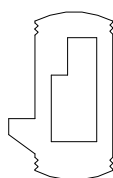
SPLIT WAFER - A wafer tumbler that does not completely surround the key blade, typically with two tumblers for each bitting position. This means each tumbler of a pair contacts alternate tracks of the same space position. ASP refers to these as Half Tumblers.



SPLIT WAFERS

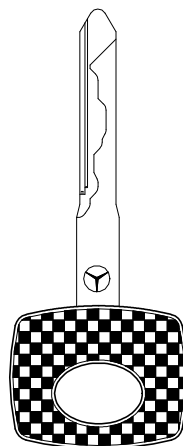


Right

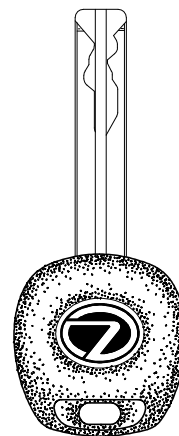


Left

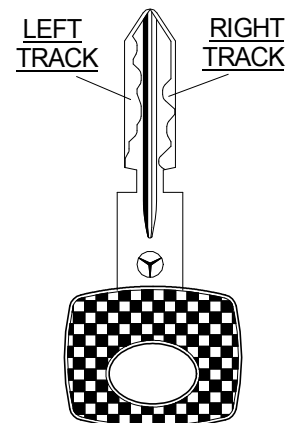
LEFT / RIGHT TRACK - Think of the track designation as the side it is always on with the key clamped in a key machine. Alternately, Instacode refers to these as Side A and Side B.



2-TRACK



4-TRACK  
INTERNAL CUT



4-TRACK  
EXTERNAL CUT

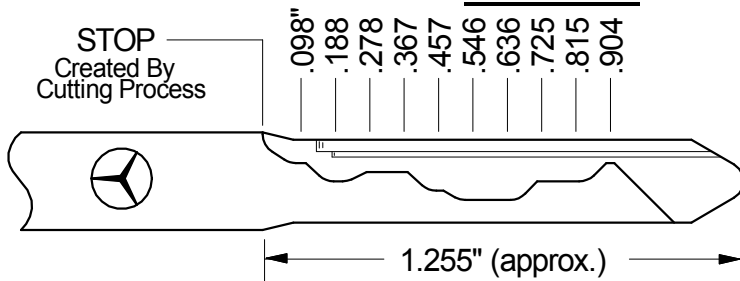
RIGHT / LEFT FORMAT - Full wafers with the tumbler contact opposite the spring tab are most often considered Right format, and tumblers with the contact on the same side of the spring tab are Left format. This convention is found where tumblers are marked R or L by a few manufacturers, and is also in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

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

# SIDEWINDER KEY BITTING

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



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

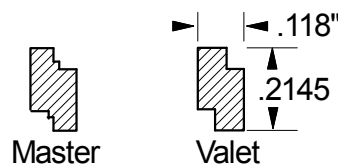
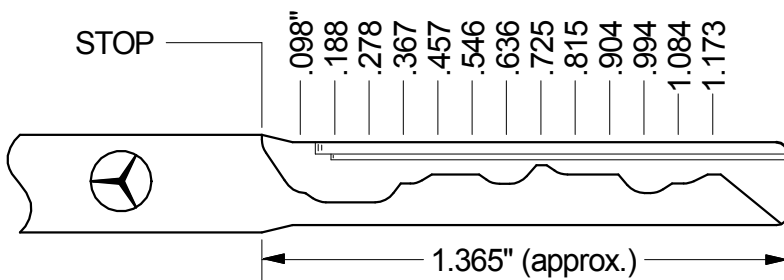
All Mercedes 2-Track keys contain at least two #5 depth cuts.

EXAMPLE  
1 3 2 2 4 5 5 3 3 1

### DEPTHS

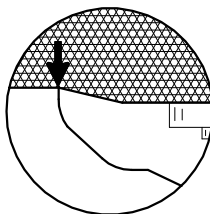
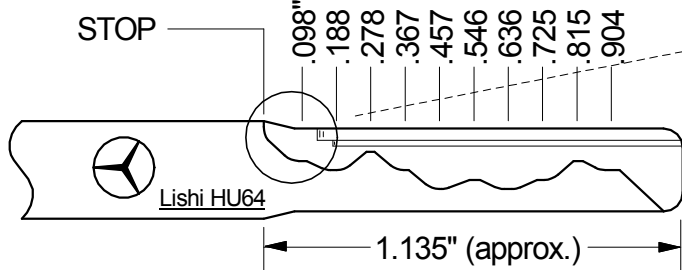
- 1 - .154"
- 2 - .130
- 3 - .106
- 4 - .083
- 5 - .059
- Incr. - .0236
- Web - .040
- MACS - 2

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



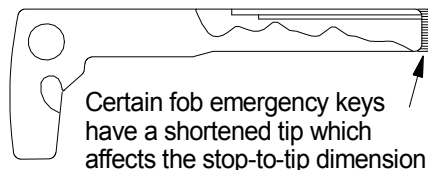
EXAMPLE  
4 5 5 3 2 2 3 1 2 2 4 3 2

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



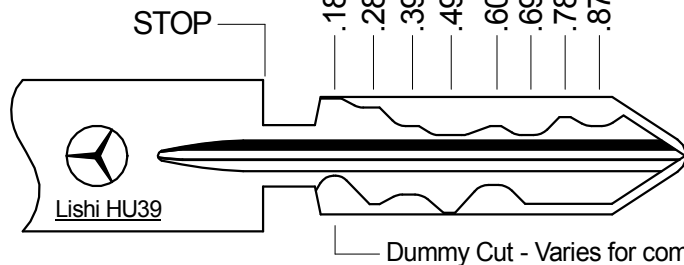
Most 2-Track keys form the stop by the cutting process. On all keys which have a widened neck such as this Mercedes, the stop should be at the point where the transition from wide to narrow begins.

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

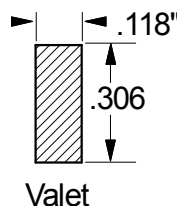
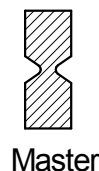


EXAMPLE  
2 3 1 3 5 4 5 4 2 3

## MERCEDES 4-Track



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



### DEPTHS

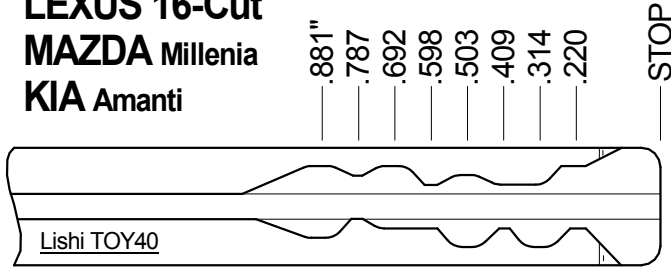
- 1 - .301"
- 2 - .277
- 3 - .253
- 4 - .229
- 5 - .205
- Web - .040
- Incr. - .0236
- MACS - See Text

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.

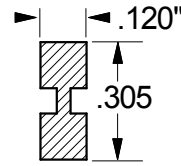
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**LEXUS 16-Cut**  
**MAZDA Millenia**  
**KIA Amanti**



★ Code Series:  
O0001 - O5000 Lexus  
20001 - 22825 Mazda  
L0001 - L1000 Kia



**DEPTHS**

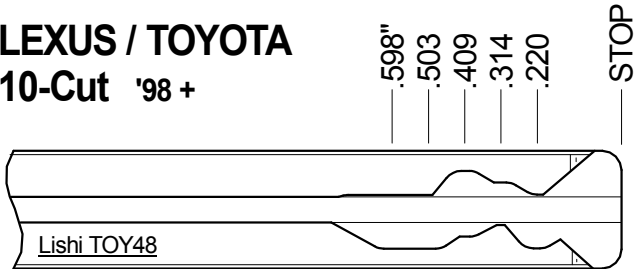
- 1 - .024"
- 2 - .047
- 3 - .071
- 4 - .095
- 5 - .118
- Incr. - .0236
- Web - .040
- MACS - 2
- (except valet cut)

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

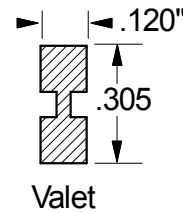
5-5 and 5-4 opposing cut combinations do not occur in the same position

Valet Cut - Right Track  
Master = 4  
Valet = 2

**LEXUS / TOYOTA**  
**10-Cut '98 +**



★ Code Series:  
40000 - 49999

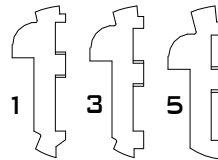


**DEPTHS**

- (1) 1 - .052"
- (2) 3 - .082
- (3) 5 - .113
- Incr. - .0305
- Web - .040
- MACS - None

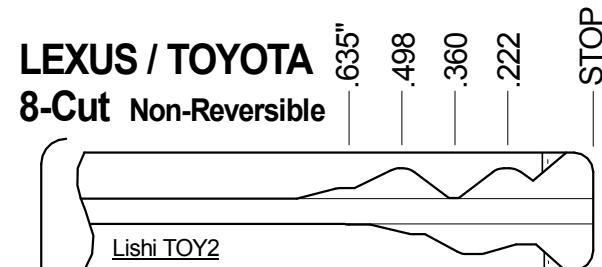
EXAMPLE  
5 5 1 3 1  
1 1 3 5 1

5-5 opposing cut combinations do not occur in the same position

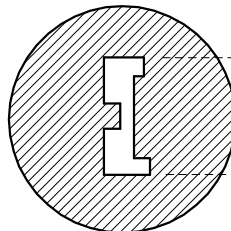


NOTE: Lexus 10-Cut tumblers are not stamped with numbers, but may easily be identified by sight

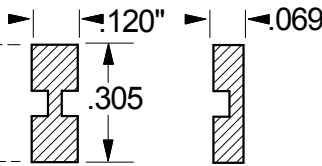
**LEXUS / TOYOTA**  
**8-Cut Non-Reversible**



★ Code Series:  
80000 - 89999



Keyway of Lock



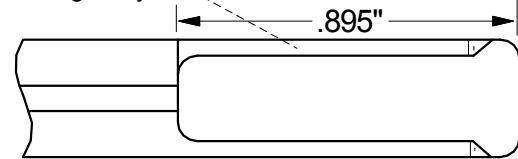
**DEPTHS**

- (I) 1 - .041"
- (N) 2 - .069
- (S) 3 - .092
- (Y) 4 - .118
- Incr. - .0256
- Web - .030
- MACS - None

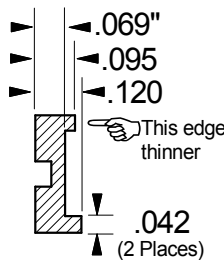
EXAMPLE  
3 1 4 1  
4 3 1 2

.590"  
.453"  
.316"  
.177"

Blade machined thinner this edge only



Non-Bitted Side



Machined Profile

This key is bitting on only one side, and is not reversible in the lock. Factory blanks come machined on the non-bitted side, but these can be made from the old style Lexus key by machining as indicated. The non-bitted side must be machined using two planes of cut depth to bypass keyway warding as shown.

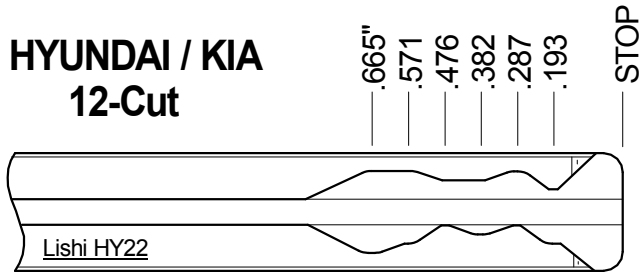
The web of the key is not centered exactly, due to the nature of the machining. The tumblers are stamped with letters which correspond to depths as indicated. The thin version is used on some later vehicles, and has no grooving on the non-bitted side.

\* Factory keys are cut with a smaller diameter cutter than the customary 2.5mm. Certain combinations may be a challenge to duplicate, as a 2.5mm tracer may not pass between opposing tracks at some positions.

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## HYUNDAI / KIA 12-Cut



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

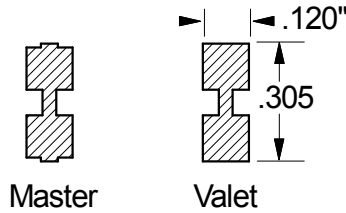
4-4 and 4-3 opposing cut combinations do not occur in the same position

★ Code Series:  
G0001 - G2500  
J0001 - J2500  
K0001 - K2500

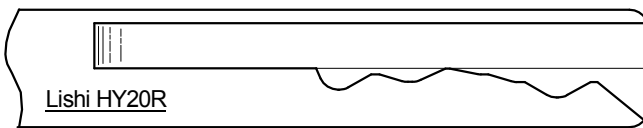
NOTE: The Lexus 16-cut format split tumblers can be used to combine these locks. Use Lexus 2-5 for Hyundai / Kia 1-4.

### DEPTHS

- 1 - .047"
- 2 - .071
- 3 - .095
- 4 - .118
- Incr. - .0236
- Web - .040
- MACS - 2

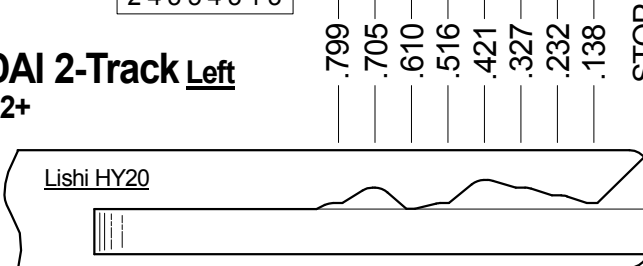


## HYUNDAI 2-Track Right Santa Fe '13+



EXAMPLE  
2 4 3 5 4 3 1 3

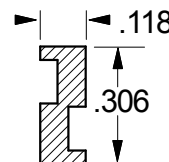
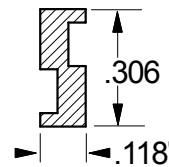
## HYUNDAI 2-Track Left Accent '12+



EXAMPLE  
4 2 5 4 1 2 3 4

★ Code Series:  
C1001 - C3500

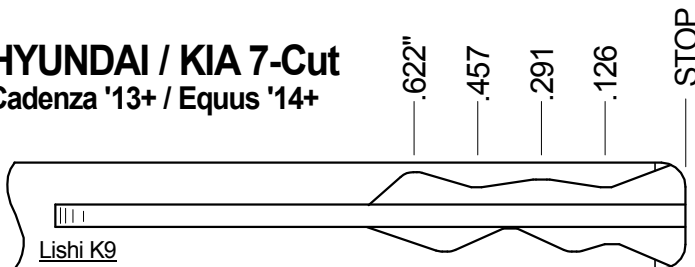
★ Code Series:  
T1001 - T3500



### DEPTHS

- 1 - .078"
- 2 - .098
- 3 - .118
- 4 - .137
- 5 - .157
- Incr. - .0197
- Web - .030
- MACS - 3

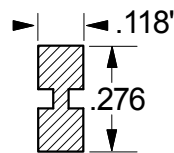
## HYUNDAI / KIA 7-Cut Cadenza '13+ / Equus '14+



EXAMPLE  
1 3 2 3  
2 5 2

.539  
.374  
.209

★ Code Series:  
U0001 - U2500 Kia  
I 0001 - I 2608 Hyundai  
(code prefix is the letter "I")



### DEPTHS

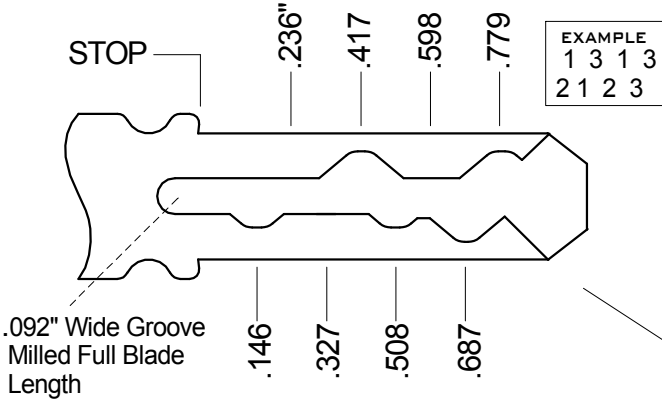
- 1 - .024"
- 2 - .043
- 3 - .063
- 4 - .083
- 5 - .102
- Incr. - .0197
- Web - .040
- MACS - None

# SIDEWINDER KEY BITTING

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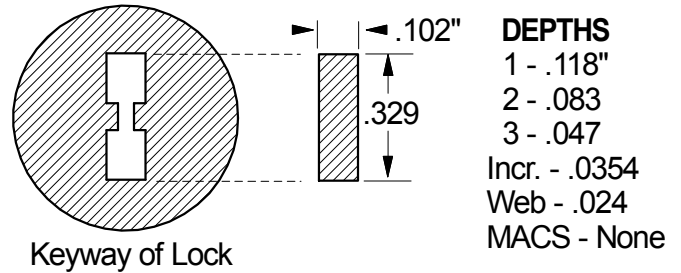
## BMW MOTORCYCLE

★ Code Series: K05001- K05600 ? The extent of the code range is not known at this time.

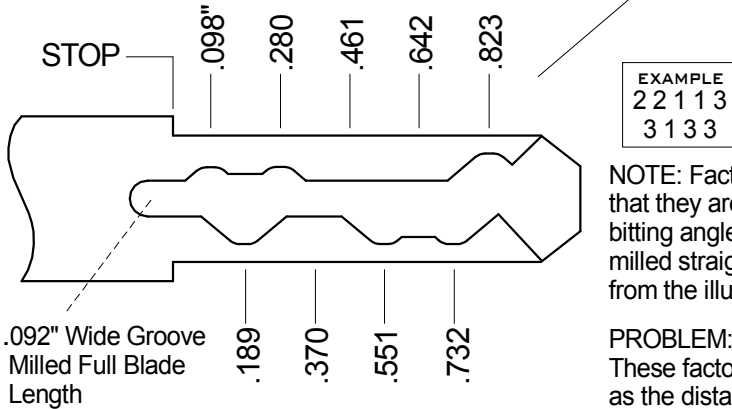


NOTE: The BMW and Ducati, etc. lock formats are similar, with the same depths, cut-to-cut dimension, and bitting characteristics. However, the first tumbler location, bow-to-first-cut dimension, and number of tumblers are different.

The BMW key presents the same problem for duplication as described below, for the Ducati. The technique for cutting these keys with the common 2.5mm diameter cutter using either a computerized key machine, or duplicating machine should be just as viable. If using a manual duplicator, you would need a BMW specific prep key. See the Ducati key text for a description.



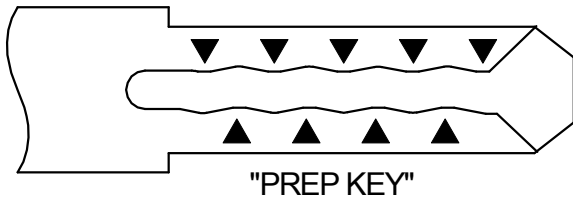
## DUCATI / PIAGGIO / KTM APRILIA / MOTO GUZZI



★ Code Series: Z2001 - Z9416

NOTE: Factory keys are cut slightly different than other sidewinder keys in that they are not truly laser cut (steeple are not totally removed), and the bitting angle does not vary for different adjacent cuts. A groove must be milled straight down the center to bypass keyway warding as can be seen from the illustration. It is not necessary to cut keys exactly as the factory.

PROBLEM: Most sidewinder machines use a 2.5 mm (.098") diameter cutter. These factory keys are cut with a smaller diameter cutter which is necessary as the distance between opposing #1 depth cuts is .092". Consequently you cannot use most machines to trace these keys as the tracer will not pass through certain positions at opposing shallow depths.



To avoid the expense and inconvenience of changing to a smaller cutter and tracer, it is possible to cut these using the common cutter by using a special "Prep Key" which is made with a larger groove. This key has small valleys between adjacent #1 depth cuts on each track that allow the larger cutter to form opposing #1 depth cuts which are staggered as the pointers indicate.

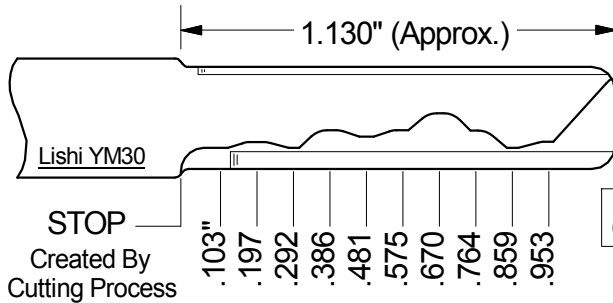
In using such a key for duplication, first copy the prep key onto your blank. Then, insert the original key and continue tracing what area you can beginning from the tip, until your guide will not pass between opposing cuts of the original key. Next, turn off the machine, raise the cutter / guide and set the guide into the next open area while aligning the cutter into the groove made previously by your prep key. Turn on your machine and trace every area you can. Depending on the cut combination, you may need to reposition the cutter again. Keys cut by this method will have a slightly different appearance from factory keys, but are just as accurate.

This manner of cutting by adding valleys between shallow depths is highly suitable for computerized machines, but at the time of this release it is not believed any manufacturer does this, nor is there a commercial source for a prep key as described.

# SIDEWINDER KEY BITTING

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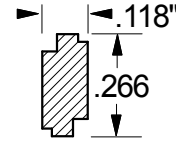
## SAAB 2-Track



STOP  
Created By  
Cutting Process

EXAMPLE  
0 1 0 3 2 3 6 3 0 1

★ Code Series:  
BC0001 - BC2865  
2S0001 - 2S2675

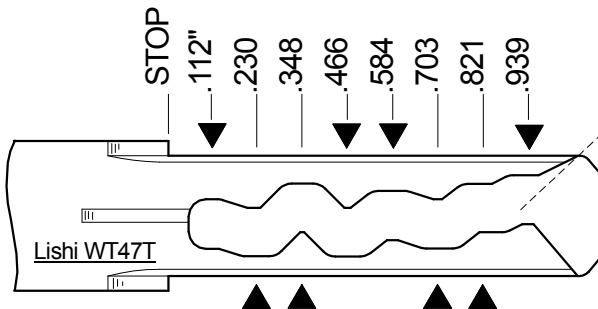


Odd positions use depths 0, 2, 4, 6 only  
Even positions use depths 1, 3, 5, 7 only

### DEPTHS

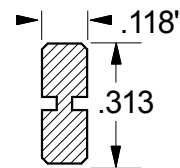
- 0 - .211"
- 1 - .196
- 2 - .180
- 3 - .165
- 4 - .150
- 5 - .135
- 6 - .120
- 7 - .104
- Incr. - .0152
- Web - .040
- MACS - 3

## SAAB 4-Track '03+



Uniform Width Groove  
.125"

★ Code Series:  
DA 0001 - 2893 (7-cut)  
DB 0001 - 4500 (8-cut)



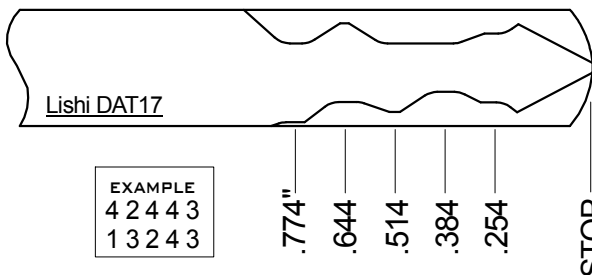
### DEPTHS

- 1 - .138" - (A)
- 2 - .116 - (B)
- 3 - .095 - (C)
- 4 - .073 - (D)
- 5 - .051 - (E)
- Incr. - .0217
- Web - .025
- MACS - 3

Unlike other sidewinder keys with a uniform width center groove, the tumblers in these locks alternate contact of the left and right track as indicated by the pointers. Opposing cut depths have an inverse relationship which renders a uniform width groove. When coding original keys, care must be taken to use proper cut root width and bitting angles to allow the tumbler protrusion height of .118" (3mm) to pass freely through the groove. Cars which use this as the emergency key within a fob key (the 9-3) have only the tip seven cuts.

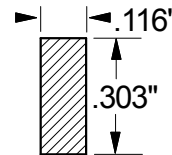
The published codes reflect the bitting for the left track. The opposing right track depth for each position will always be 6 minus the left track depth. Tumblers are stamped with letters A through E which correspond to the depth of cut and track (left/right) which the tumbler contacts. For instance, if the first two positions are cut 2 1 (left track), then the first two cuts of the right track would be 4 5. The first two tumblers in the lock would be B E since with the first position the tumbler contacts the left track, and with the second position the tumbler contacts the right track. It is vital to understand this relationship when decoding a lock. The key depicted would correspond to a code bitting 2 1 4 1 3 2 4 5. The right track would be cut 4 5 2 5 3 4 2 1 and the lock combined B E B A C D B E bow to tip.

## SUBARU '08 +



EXAMPLE  
4 2 4 4 3  
1 3 2 4 3

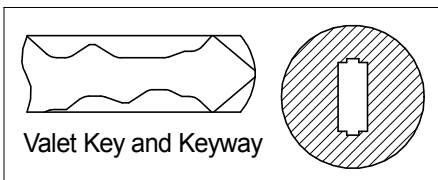
★ Code Series:  
T0001 - T3000



### DEPTHS

- 1 - .292"
- 2 - .266
- 3 - .240
- 4 - .215
- Incr. - .0256
- Web - .037
- MACS - 2

MASTER / VALET: Secondary locks have a keyway that is warded which prevents an uncut blank from entering. Valet keys are cut with a more obtuse tip angle which creates a section that is full blank height ahead of the 5th cut position. This prevents the valet key from entering. Because of the necessary bitting angle for valet keys, a number 4 cut depth is never used in the 5th position.

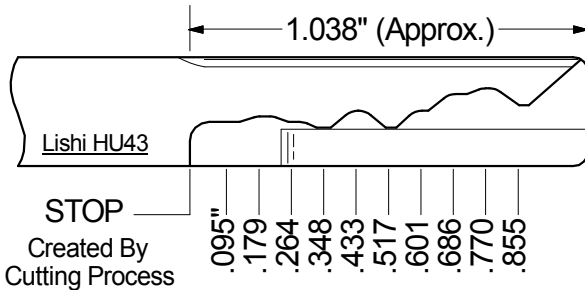


Valet Key and Keyway

# SIDEWINDER KEY BITTING

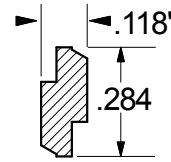
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## PONTIAC GTO



★ Code Series:  
H0001 - H3000

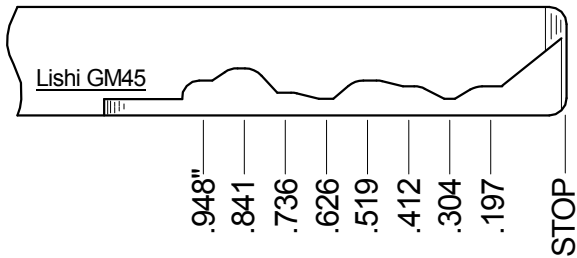
EXAMPLE  
3 4 3 2 5 2 5 8 9 6



Odd positions use depths 1, 3, 5, 7, 9 only  
Even positions use depths 2, 4, 6, 8 only

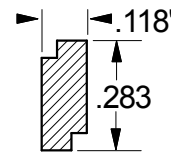
- DEPTHS**
- 1 - .198"
  - 2 - .183
  - 3 - .169
  - 4 - .154
  - 5 - .140
  - 6 - .125
  - 7 - .111
  - 8 - .096
  - 9 - .082
- Incr. - .0146  
Web - .040  
MACS - 3

## PONTIAC G8 / CHEVROLET Caprice 11+



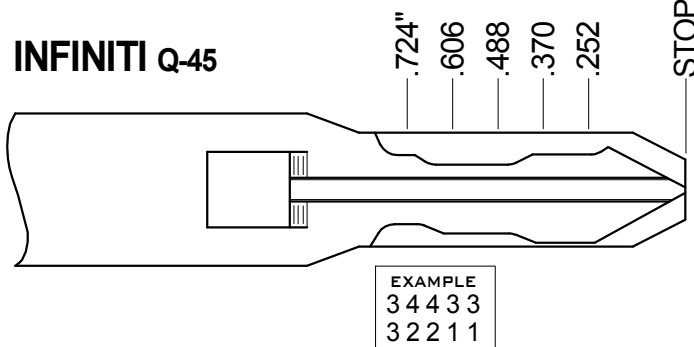
★ Code Series:  
60000 - 62113

EXAMPLE  
4 6 2 1 4 3 1 3

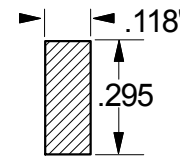
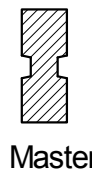


- DEPTHS**
- 1 - .239"
  - 2 - .223
  - 3 - .207
  - 4 - .191
  - 5 - .176
  - 6 - .160
- Incr. - .0157  
Web .045  
MACS - 4

## INFINITI Q-45

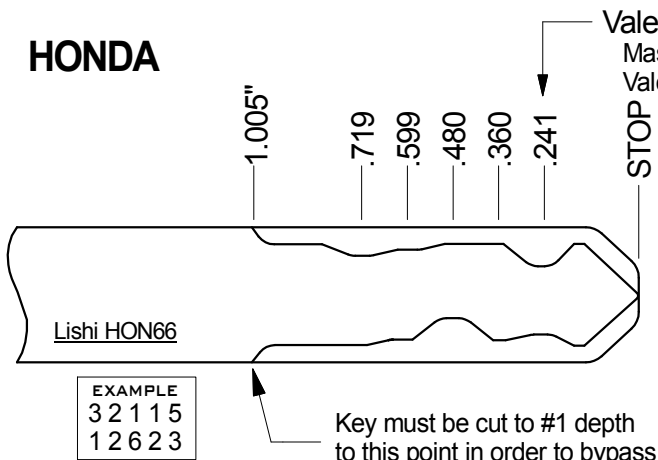


★ Code Series:  
0001 - 6000



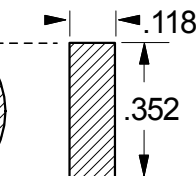
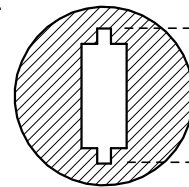
- DEPTHS**
- 1 - .286"
  - 2 - .262
  - 3 - .239
  - 4 - .215
- Incr. - .0236  
Web - .040  
MACS - 2

## HONDA



Valet Cut - Left Track  
Master = 5  
Valet = 2

★ Code Series:  
J,K,L,M 000 - 999



- DEPTHS**
- 1 - .312"
  - 2 - .298
  - 3 - .283
  - 4 - .269
  - 5 - .255
  - 6 - .241
- Incr. - .0142  
Web - .035  
MACS - 4

EXAMPLE  
3 2 1 1 5  
1 2 6 2 3

Key must be cut to #1 depth to this point in order to bypass keyway warding in the lock.

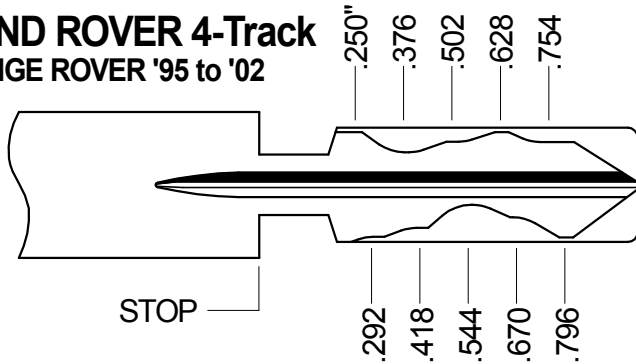
NOTE: The uncut center web of the key should be .035". If the web exceeds .040", the cut key will not enter the lock.

Some code publishers display this series showing 6 spaces. Ignore the last space (it is always a #1 depth both tracks). Some compartment locks do contain a tumbler in the sixth position. The cut in the 5th position on the right track will only be a #3 or #5 depth.

# SIDEWINDER KEY BITTING

2014 EDITION

## LAND ROVER 4-Track RANGE ROVER '95 to '02

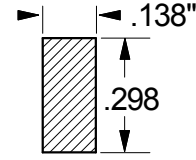


★ Code Series:  
0001 - 6000

EXAMPLE  
1 3 2 1 2  
1 2 4 3 1



Master

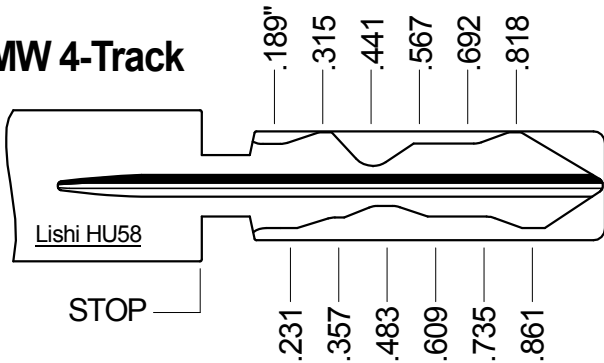


Valet

### DEPTHS

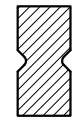
- 1 - .285"
- 2 - .261
- 3 - .234
- 4 - .202
- Web - .040
- MACS - None
- Variable Increment!  
(.6, .7, .8 mm)

## BMW 4-Track

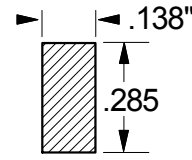


★ Code Series:  
BH011450 - BH241450

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



Master



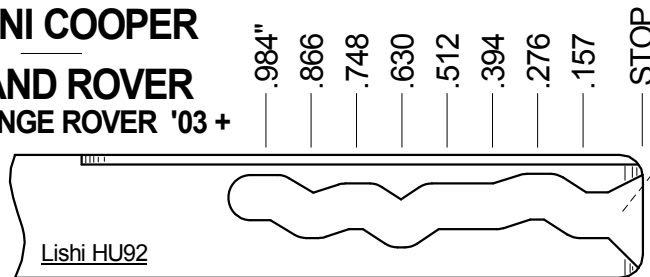
Valet

### DEPTHS

- 1 - .276"
- 2 - .253
- 3 - .225
- 4 - .194
- Web - .040
- MACS - None
- Variable Increment!  
(.6, .7, .8 mm)

## BMW 2-Track MINI COOPER

## LAND ROVER RANGE ROVER '03 +

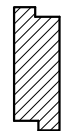


Tumblers contact the right track only

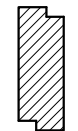
EXAMPLE  
1 3 2 4 2 2 1 3

Uniform Width Groove  
.118" (3mm)

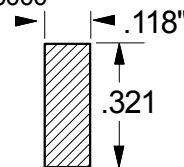
★ Code Series:  
HBA0001 - HBA6000



Master



Valet

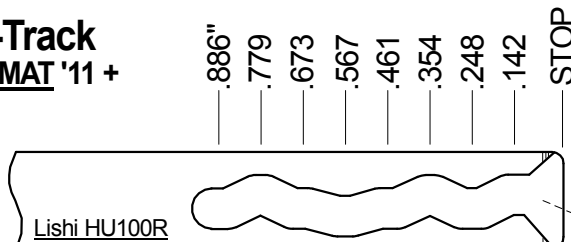


Mini  
Cooper

### DEPTHS

- 1 - .150"
- 2 - .126
- 3 - .103
- 4 - .079
- Incr. - .0236
- Web - .025
- MACS - 2

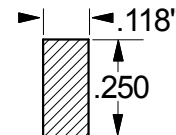
## BMW 2-Track NEW FORMAT '11 +



Tumblers contact the left track only

★ Code Series:  
Z0001 - Z6000 ?

EXAMPLE  
2 4 2 1 2 4 2 4



Uniform Width Groove  
.105"

### DEPTHS

- 1 - .113"
- 2 - .093
- 3 - .074
- 4 - .054
- Incr. - .0197
- Web - .025
- MACS - None

The BMW HU100R key is the reverse format of the common GM HU100 key. This means the bitting is referenced from the left track, instead of the right track. Like the GM codes, this is also a "Z" prefix, but the bittings are not the same as the GM "Z" code series. Codes are not published as of this printing, and the full code range is not certain.

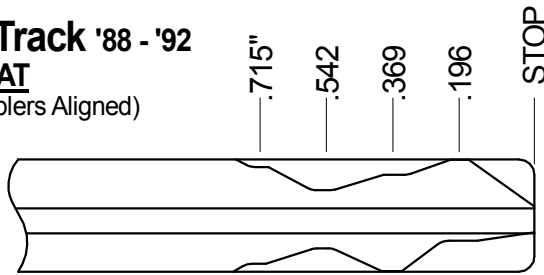


# SIDEWINDER KEY BITTING

2014 EDITION

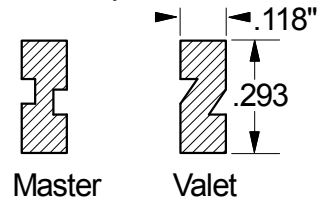
## VOLVO 4-Track '88 - '92

**OLD FORMAT**  
(Opposing Tumblers Aligned)



EXAMPLE  
2 5 3 1  
2 4 1 5

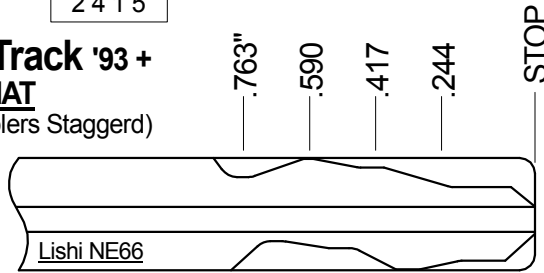
★ Code Series:  
0AAAA - 9XXXX  
Note: The tumblers in the '88 - '92 locks are diecast zinc alloy.



**DEPTHS**  
1 - .292"  
2 - .272  
3 - .253  
4 - .233  
5 - .214  
Incr. - .0197  
Web - .040  
MACS - None  
\*Z - .138

## VOLVO 4-Track '93 +

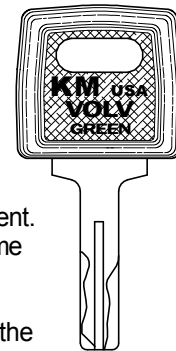
**NEW FORMAT**  
(Opposing Tumblers Staggered)



EXAMPLE  
3 1 2 4  
4 3 1 2

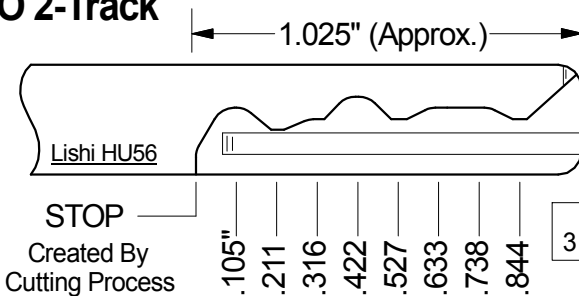
★ Code Series:  
1V00000 - 5V12295

The "VOLV" key is used on construction equipment. The keys are all the same  
Left Track 1545  
Right Track 4231  
But these are cut using the OLD format specification.



**DEPTHS**  
1 - .292"  
2 - .267  
3 - .241  
4 - .216  
Incr. .0256  
Web - .040  
MACS - None

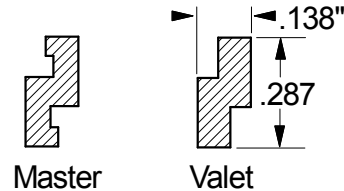
## VOLVO 2-Track



STOP  
Created By  
Cutting Process

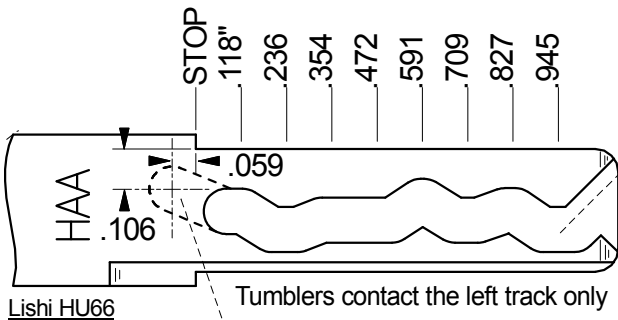
EXAMPLE  
3 1 2 4 2 3 3 2

★ Code Series:  
DH0001 - DH4000



**DEPTHS**  
1 - .170"  
2 - .141  
3 - .112  
4 - .083  
Incr. - .0291  
Web .040  
MACS - 2

## VOLKSWAGEN / AUDI / PORSCHE

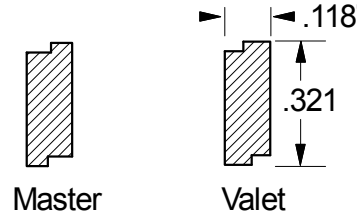


### EXTENDED CUT

This is found on certain vehicles which use the transponder to validate an electro-mechanical ignition lock. The cut root is in the same location for all keys, and interacts with an element to retain the key in the lock.

EXAMPLE  
3 1 2 2 4 2 3 1

Uniform Width Groove  
.118" (3mm)



**DEPTHS**  
1 - .150"  
2 - .126  
3 - .103  
4 - .079  
Incr. - .0236  
Web - .025  
MACS - 2

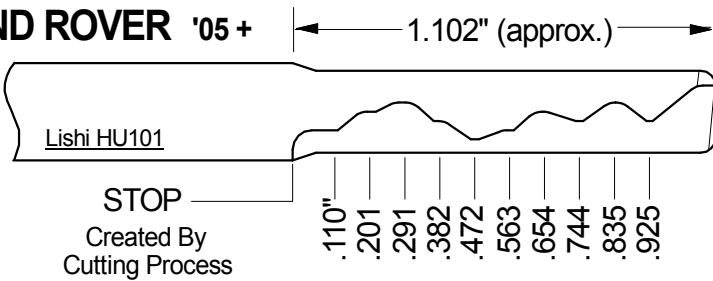
★ Code Series:  
HAA 0001 - 8110  
NAA 0001 - 8110 (Designates valet key)

# SIDEWINDER KEY BITTING

**FORD 10-Cut '11 +**  
**JAGUAR '07 +**  
**VOLVO '05 +**  
**LAND ROVER '05 +**

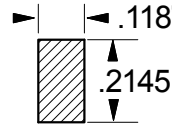
2014 EDITION

★ Code Series:  
 10001 - 11500 Ford / Jaguar  
 0001 - 4000 Rover  
 4000 - 9000 Volvo

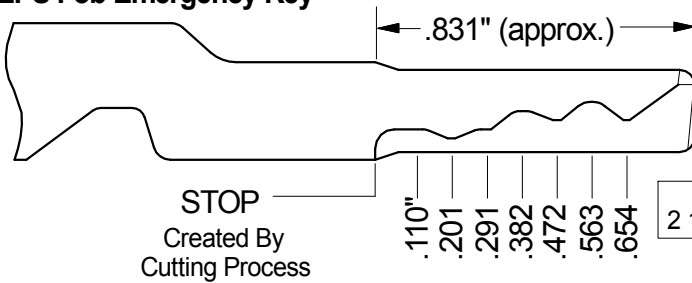


EXAMPLE  
2 4 5 3 1 2 4 3 5 3

**DEPTHS**  
 1 - .178"  
 2 - .154  
 3 - .131  
 4 - .107  
 5 - .084  
 Incr. - .0236  
 Web - .038  
 MACS - 2



**FORD 7-Cut '14+**  
**PEPS Fob Emergency Key**



EXAMPLE  
2 1 2 4 3 5 3

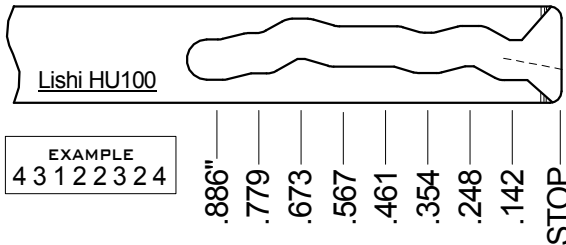
★ Code Series:  
 11501 - 13000

This very short blade may present an issue with some duplicators, as tip gauging from the closet position of the key vise may not allow the widened portion of the blade to be outside the grip range. One tactic to facilitate duplication is the shim both the pattern key and blank slightly by the same distance back from the stop gauge.

**GENERAL MOTORS 8-Cut '08 +**  
**SAAB '08 +**

Tumblers contact the right track only

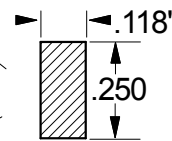
★ Code Series:  
 Z0001 - Z6000



EXAMPLE  
4 3 1 2 2 3 2 4

Uniform Width Groove  
 .104"

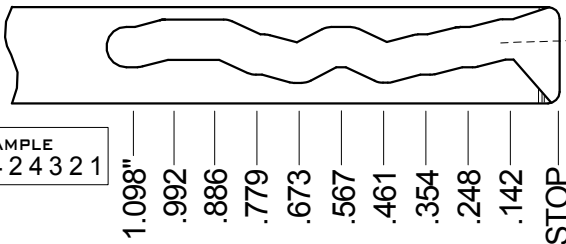
**DEPTHS**  
 1 - .113"  
 2 - .093  
 3 - .074  
 4 - .054  
 Incr. - .0197  
 Web - .028  
 MACS - None



**GENERAL MOTORS 10-Cut '14 + Trucks**

Tumblers contact the right track only

★ Code Series:  
 V0001 - V5574



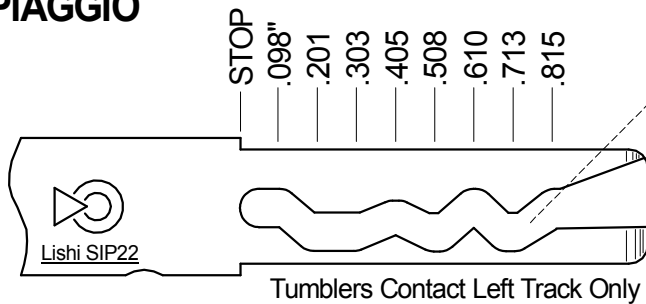
EXAMPLE  
2 1 1 3 4 2 4 3 2 1

Uniform Width Groove  
 .104"

# SIDEWINDER KEY BITTING

2014 EDITION

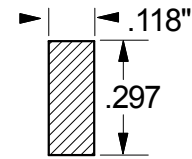
## FIAT / MASERATI PIAGGIO



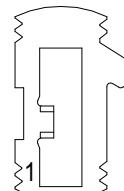
EXAMPLE  
3 1 1 2 1 3 1 3

Uniform Width Groove  
Approx. .100" \*

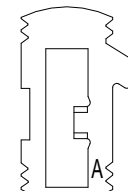
★ Code Series:  
DE0001 - DE11210



**DEPTHS**  
(A) 1 - .166"  
(B) 2 - .135  
(C) 3 - .103  
(D) 4 - .072  
Incr. - .0315  
Web - .024  
MACS - 2



Right



Left

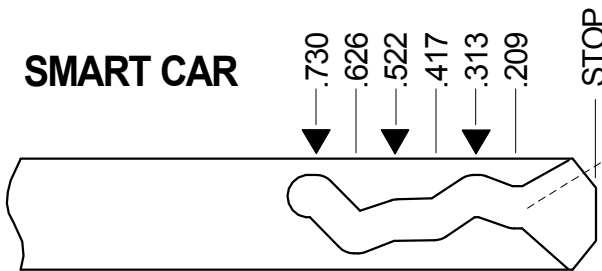
Door  
Tumblers

\* The groove is not actually a uniform width. Factory keys are cut using a smaller diameter cutter, and opposing tracks are closer where the bitting is angled between adjacent cuts that differ in depth. This may create a problem with a 2.5mm tracer fitting between opposing tracks during duplication.

Locks contain both left and right format tumblers. In the door locks, right format tumblers are marked with the cut depth, but the left format tumblers are designated with a corresponding letter (A-D). If you need to remove tumblers from door / compartment locks, uncrimp the scalp of the core and remove the flat tumbler retainer located underneath.

The ignition lock is sidebar, other locks are not. They are a different form tumbler and are marked with an opposite scheme as the other locks. This means the left format tumblers have numbers, and the right have letters.

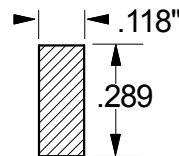
## SMART CAR



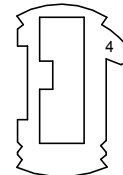
EXAMPLE  
8 4 6 3 8 2

Uniform Width Groove  
.110"

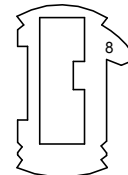
★ Code Series:  
90001 - 99000 ?



**DEPTHS**  
1 / 5 - .131"  
2 / 6 - .107  
3 / 7 - .077  
4 / 8 - .042  
Web - .037  
Variable Increment!  
(.60, .75, .90 mm)



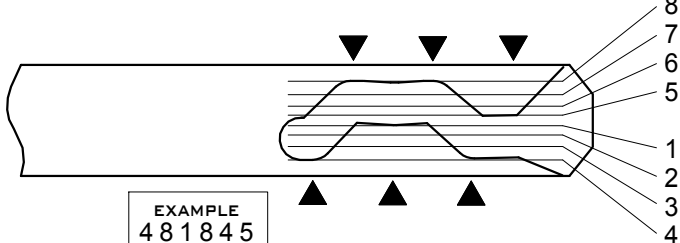
Right



Left

Cut depths 5 - 8 register on the left track  
Cut depths 1 - 4 register on the right track

Tumblers can be either left or right format. Left format tumblers have the protrusion for contacting the key on the same side as the spring tab, and right format the opposite. The tumblers are stamped with numbers with the right format tumblers numbered 1, 2, 3 or 4, and the left numbered 5, 6, 7 or 8. Locks will contain a combination of both left and right format tumblers.



EXAMPLE  
4 8 1 8 4 5

These keys are cut with a uniform width internal groove, and tumblers alternate contact of the left and right tracks. Two possible bitting formats are shown, but other bitting formats have been observed (e.g. L R L R R R). The pointers indicate tumbler contact on the left and right tracks in the examples.

**DECODING LOCKS:** Orientation of the tumblers is unique. To fit a key from a lock, record the numbers stamped on each tumbler. Then convert the numbers in positions 3 and 6 to the complementary cut according to the depth scheme (e.g. change 1 to 5, 2 to 6, etc.).

The locks use a combination of left and right format tumblers which are turned in different directions. Tumblers in positions 1, 2, 4 and 6 are biased opposite of tumblers in positions 3 and 6. The way a bitting is presented here requires that you account for the depth and which track each cut contacts.

Therefore, a lock with tumblers stamped 3 8 5 8 4 2 (bow to tip), will convert to bitting 3 8 1 8 4 6. The way the bitting is represented here is contrived, as no factory bitting-from-code information is available at the time of this printing, nor is the full code range known.

For example, a #1 depth will be cut almost (but not exactly) the same as a #8 depth, with the difference being which track the tumbler registers on.

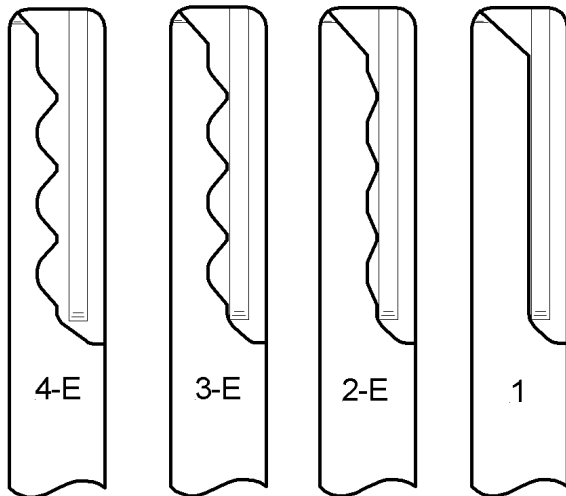
It is very difficult to properly code original keys for this series without the use of computerized key machinery.

# Coding Original Sidewinder Keys

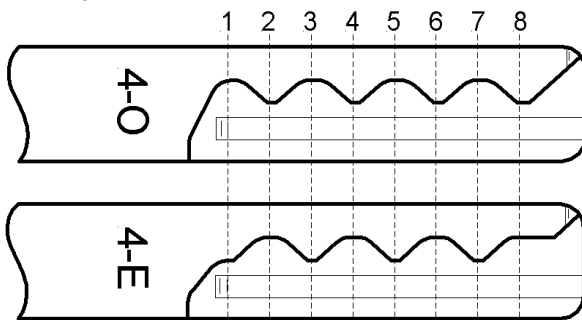
## ... Using Depth Keys

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.

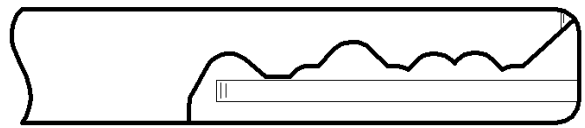


When cutting any sidewinder key, It is important to understand it's characteristics such as how the key stops, and the number of depths and spaces. The process of cutting a Volvo 2-track key to combination 31242332 will be presented as an example. It may be advantageous to write the bitting in a way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

○ E ○ E ○ E ○ E  
**3 1 2 4 2 3 3 2**

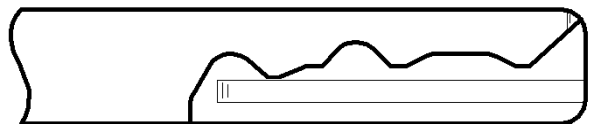
Begin by duplicating the complete # 1 depth key onto the blank. Follow by selecting the next appropriate depth key. With the sample bitting, # 2 depths are used in both odd and even positions. Use the **2-E** side of the depth key and trace the cut for position 8, then turn the depth key over and use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

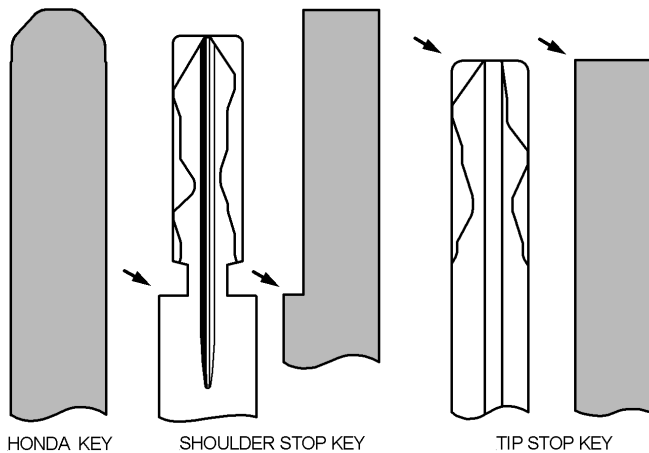
## ... Using Pattern Keys

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.

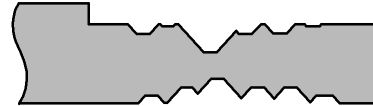
One alternate method of originating is to create a pattern key. A pattern key is made from blank material, and is essentially a silhouette of the bitting for the sidewinder key. Advantages to using the pattern key method are the ability to efficiently remove steeples, achieve optimal bitting angle, and 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.

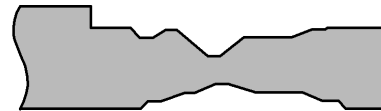


The Honda sidewinder service key is ideal for making most pattern keys. Begin by cutting to the same height as the blank for the key type you are working with. If you are creating a key for a type which tip stops, then blunt and square the tip of the pattern key. If you are working with a key which uses 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).

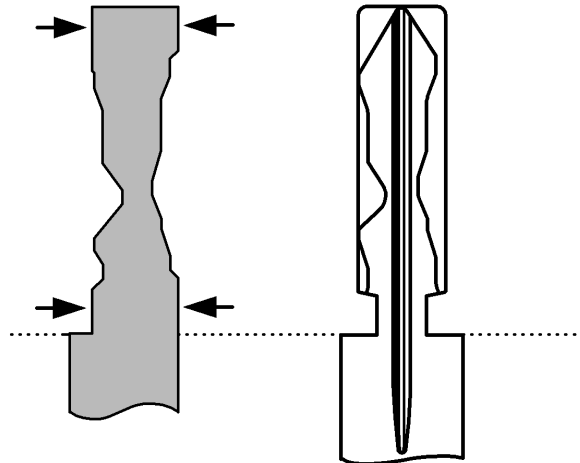
After you have created a blank pattern key to the proper dimensions for the type you are cutting, use the bitting specifications with your code machine to cut the combination you need.



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.

