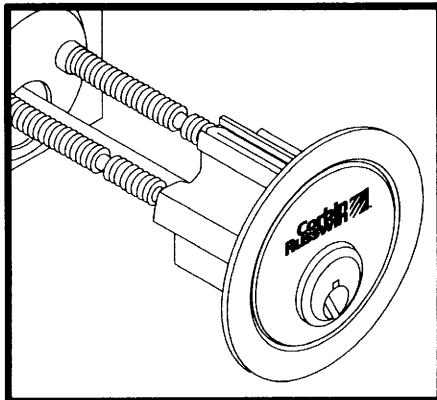
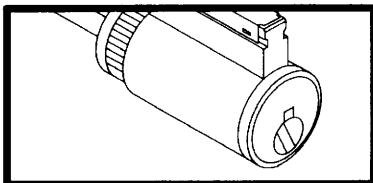
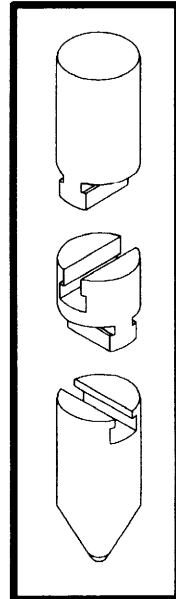
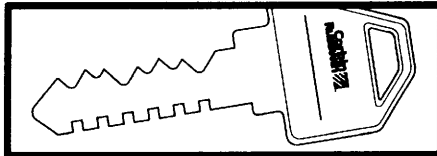
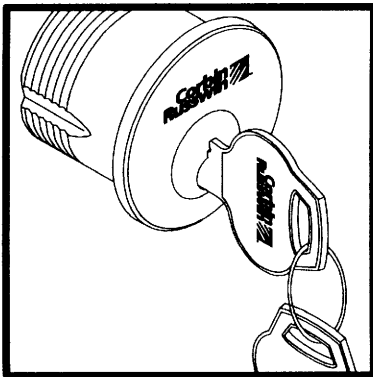
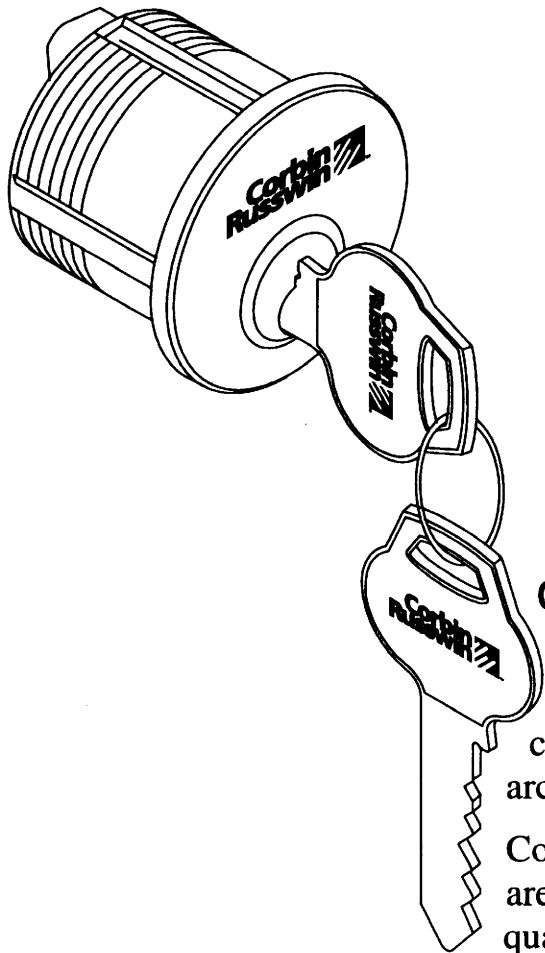




Cylinder Manual

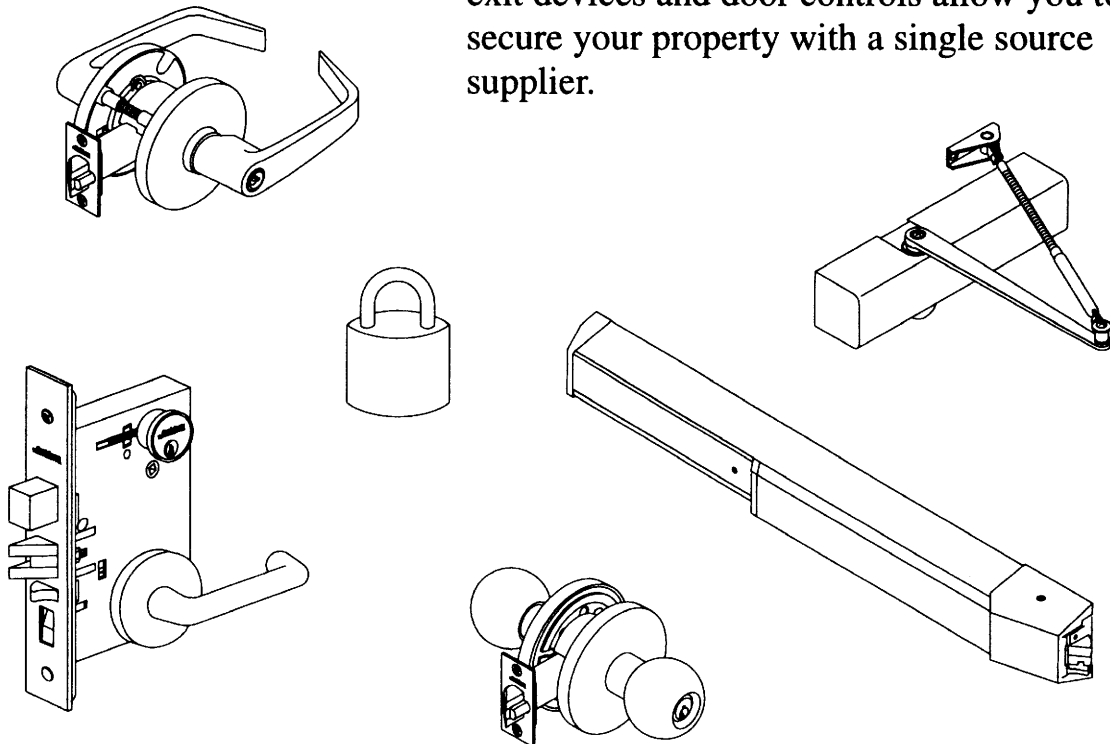




Cylinders . . . The Heart of Our Products

A master key system is the “software” of a building’s security. It must be coupled with fine cylinders and architectural hardware.

Corbin Russwin is a leader in all three areas. Expertly designed systems, high quality cylinders and a full line of locksets, exit devices and door controls allow you to secure your property with a single source supplier.



Unit 1 — Required Reading

How to Use This Manual 2
 Key Classes 3
 Depth Systems 4
 Master Keying Capacity 5
 Plug Diameters 11

Unit 2 — Keys

Key Blanks 12
 Keyways and Key Sections 14

Unit 3 — Cylinder Construction and Combining

Conventional 24
 Interchangeable Core 27
 Old Round Interchangeable Core 32
 Master Ring 33
 High Security 39
 High Security Interchangeable Core 43
 High Security Blockout Function 44
 Brink Function 45
 Hotel Function 46
 Padlocks 50
 Construction Master Keying 52

Unit 4 — Pins

Using Colored Pin Kits and Optional Pins 54
 Pin Size Comparisons 56
 Pin Kits: Product Line and Contents 56

Appendices

A Key Bitting Specs and Pin Lengths by Key Class 61
 B Bitting Prefixes 78
 C Key Blank Cross Reference 84
 D Cylinder Parts and Tools 88
 E Glossary 90

Keyway Quick Index

Keyway	Class	Bitting & Pins	Profile(s)	Keyway	Class	Bitting & Pins	Profile(s)
26 (discontinued)	S	76	76	752	752	73	19
27 Series	X	66, 67	17	852	852	71	19
57 Series	X	66, 67	16	861 (discontinued)	861	77	77
59 Series	Z	62, 64 (Hi Sec 63)	15	861UB (discontinued)	S	76	76
60	Z	62, 64 (Hi Sec 63)	15	961, 962, 963 (now 98x)	981	70	19
67 Series	X	66, 67	17	981, 982, 983	981	70	19
70	Z	62, 64 (Hi Sec 63)	14	900(B) (discontinued)	900	77	77
77 Series	X	66, 67	17	A Series	A	72	22
80 (discontinued)	K	74	74	AR, BR, BL	X	66, 67	14
96 (discontinued)	S	76	76	D Series	DH	62, 65 (Hi Sec 63)	18
97	X	66, 67	14	G	852	57	19
98 (discontinued)	(X)	75	75	H Series	DH	62, 65 (Hi Sec 63)	18
99	X	66, 67	19	L Series	Z	62, 64 (Hi Sec 63)	14
252	852	71	19	K Series (now N)	N	68, 69	20, 21
750 (discontinued)	750	75	19, 75	N Series	N	68, 69	20, 21
751 (discontinued)	K	74	74	Z Series (now A)	A	72	22

How to Use This Manual

In an effort to promote a common language, this manual adopts the terminology standardized in *The Professional Glossary of Terms Relating to Cylinders, Keys and Master Keying*, reprinted in Appendix E.

Corbin and Russwin each have nearly a century of experience in the manufacture of pin tumbler cylinders. During this long history, we have made technological advances creating a far wider variety of cylinder and key types than any other manufacturer.

For the hardware distributor or retail locksmith, this manual provides everything under one cover, making it easier to service all your customers' Corbin Russwin cylinders and keying systems. It includes all modern cylinders and keys, as well as certain discontinued items which are still often encountered in the field.

Because of the large amount of detail presented here, the institutional locksmith who services only one Corbin Russwin master key system with one or two types of cylinders will find only a few selected pages of this manual useful. Those pages should be clearly marked, or copied and placed in a separate binder for fast reference. This helps avoid confusion with information which may not be relevant.

To help determine which pages apply to your keying system, you must:

1. **Determine the "bitting class."** This is based on your keyway(s) and detailed on the next page.
2. **Determine the depth system.** If you have factory original keys with the depths stamped on the bow, this task will be easier. Find the page(s) in Appendix A devoted to your bitting class. Measure two or three factory original keys with calipers or some other accurate measuring device.

There are two different depths systems possible for most Corbin Russwin bitting classes. Scan the depth specifications on both pages as you take the measurements and zero in on the one page which matches your system. That will be your most valuable reference page. It contains all pin lengths you will need to service your system using original Corbin Russwin parts.



CANADA ONLY

Most Canadian Corbin Russwin keying systems generated before 1982 deviate from the U.S. depth and spacing specification in Appendix A. If you are servicing Canadian cylinders, you need the special Canadian Supplement to this Appendix.

3. **Determine the type of cylinders** you are servicing (conventional, interchangeable core, high security, master ring, etc.) Some keying systems integrate more than one of these cylinder types. Find those pages in Unit 3 through the Table of Contents. They provide step by step instructions on combining your cylinders using the pin lengths from the page in Appendix A.
4. **Find the information on your keyway(s)** in Unit 2. This allows you to see the relationship between your keyways and the amount and direction of expansion.

Prevent the Destruction of Your Master Key System

While this manual provides a comprehensive technical review, it does not substitute for training in master keying. The reader is strongly advised to attend a formal class on master keying presented by local or national locksmith associations.

Fine books are also available on the subject through locksmith suppliers and trade magazines. This instruction will help you to understand master keying theory so you can service master key systems without introducing key interchange.

Obtain a copy of the bitting list for your system through your Corbin Russwin distributor. This is a list of all key combinations used. Obtain all new combinations through the factory to maintain the key system's integrity. If you do generate combinations in the field, be sure to update the factory so no duplication will occur on future orders.

Even when the correct combinations are used, a system can deteriorate when keys are not cut properly. Key machines must be adjusted periodically to be sure they will make accurate keys.

If a cylinder is combined to a third or fourth generation duplicate key, or an inaccurate code key, it usually will not operate properly with factory original keys. This practice can also destroy a master key system by creating key interchange with keys which are cut correctly but *not supposed to operate*.

Key Bitting Classes

A "bitting class" is a major grouping of keys, based on the width (height) of the key blade and certain characteristics of the key bitting dimensions. You must know the class when ordering cylinders, plugs and key blanks because certain key bows and cylinder types are not available with some of the older bitting classes. Refer to the catalog or price book for availability.

Each bitting class has its own system of depths for the key cuts, so it is extremely important to know the bitting class when originating keys on code machines in the field. Using the wrong specs usually causes cylinder malfunction and key interchange in a keying system. See Appendix A for complete specs.

Corbin Bitting Classes

The keyways which were associated only with Corbin before the brand merger are the most straightforward. Corbin has only two bitting classes. They are called *X Class* and *Z Class*. The distinguishing feature of X Class keys is the radiused blade bottom.

Each key section or multiplex key system is strictly associated with one class. They are easy to differentiate because each had a different standard bow. By late 1993, however, all Corbin Russwin keys will have a common bow shape. The differentiating characteristics are illustrated below with the traditional bows.

Corbin's oldest keyways are X Class and were developed between the 1890's and 1968. The Z Class was introduced in 1959. Both are still active for new keying systems.

Most X Class cylinders manufactured since 1983 have a slot milled into the plug face to compensate for the difference in the spacing to the first cut. See below. The bottom shoulder was removed from all X Class keys to prevent interference in knobs and cylinders.

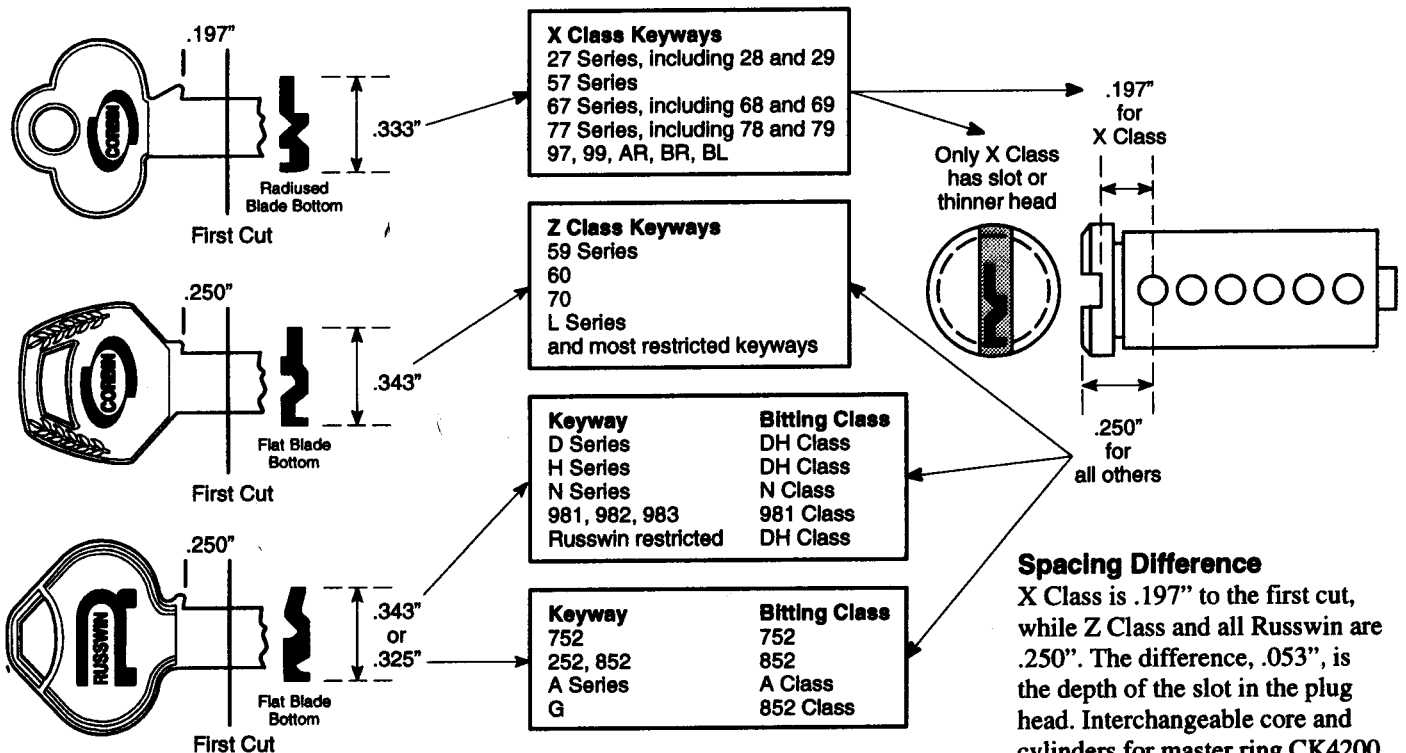
Russwin Bitting Classes

These are harder to distinguish, because Russwin's single bow shape provides no clues.

Russwin keys use two different blade widths: .325" for keyways designed before 1938 and .343" for all others. Each blade width has three different bitting classes associated with it.

New Corbin Russwin Keyways

All Corbin Russwin keyways introduced in 1993 follow Corbin Z Class specifications. This includes the L Series and new patented keys not published for security reasons.

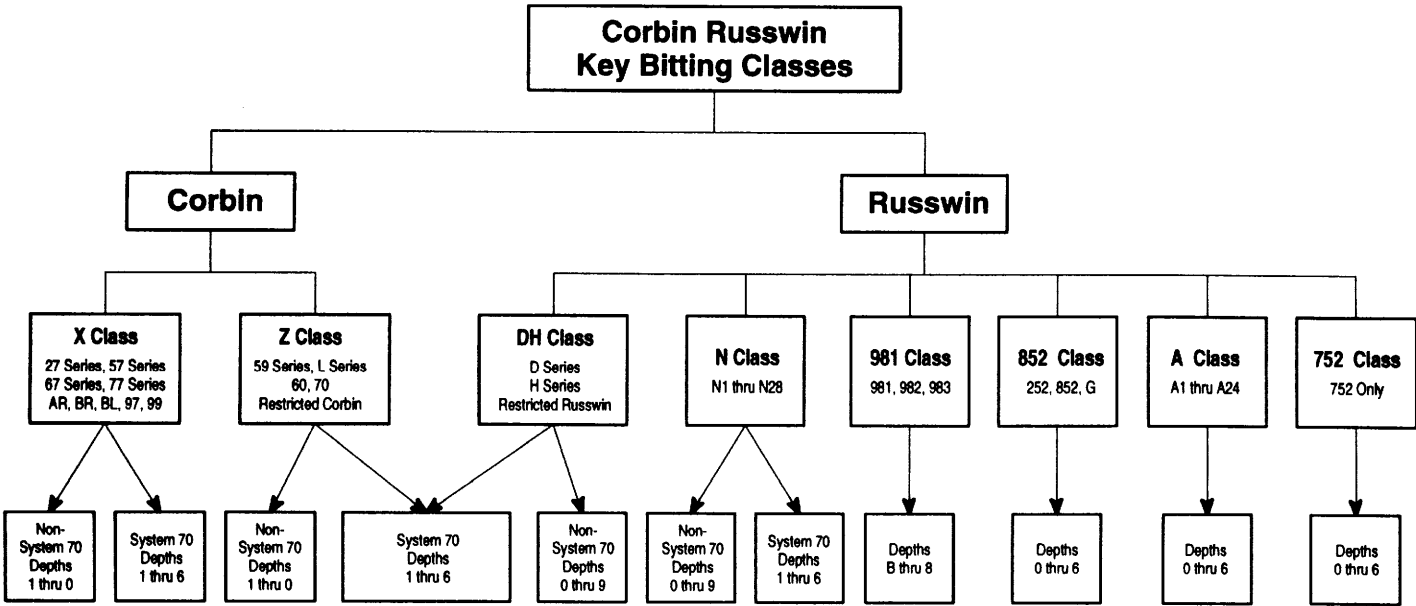


Depth Systems

In 1970, the factory began using a new depth system called System 70. The increment is .028", or the old Corbin increment. Its use was limited to the largest keying systems until 1976, when it became the standard for DH, N and Z Class keys. X Class was added in 1977.

To differentiate, the original 10-depth system is now called "Pre-System 70" (or "Non-System 70".) If you are servicing one keying system, it will use *one or the other*. Depth systems must never be mixed!

The illustration below shows all Corbin Russwin key classes, and further breaks them down to show the two depth systems, where available.



Depth Systems and Master Keying Capacity

When servicing a master key system, the reader is cautioned to use only key bittings which are compatible with the system. Never use stock keys or other random combinations. Doing so introduces key interchange and quickly destroys the integrity of the keying system.

Correct master keying requires much more than simply knowing which pins to drop into a cylinder. As stated on page 4, there are so many sources for training in the general science of master keying. The purpose of this section is to add Corbin Russwin specifics to an understanding of general principles learned elsewhere.

Master keying classes are presented around the country by national and local locksmith associations. Locksmithing periodicals often contain articles on master keying and there are several good books available on the subject through the aforementioned periodicals and through locksmith supply companies.

We cannot include a comprehensive presentation of master keying in these few pages and lock manufacturers often deviate from published rules to accommodate certain situations. If you discover deviations from the parameters on these pages, contact the Key Records Department at Corbin Russwin to determine whether the bittings are legitimate, or the result of errors.

Two areas where Corbin Russwin deviates from the general rules on the next few pages are the frequent use of the rotating constant method of progression and the type of progression used in master ring systems. The latter is briefly covered in the master ring section of Unit 3. The former must be learned from master keying text books and classes.

Keying System Limitations

We are embarking on a presentation of the math used to determine the number of theoretical change keys in a master key system. However, many *theoretical* combinations are not actually *usable*. For instance, many keys must be eliminated simply because they cannot physically be cut. This occurs when a very shallow cut is next to a very deep cut. This concept is called the *maximum adjacent cut specification* (MACS.)

System 70's MACS is 4. That means that combinations with 1 next to 5 (difference of 4) are acceptable, but those with 1 next to 6 (difference of 5) are uncuttable. Such combinations are called *MACS violations* because they exceed the MACS.

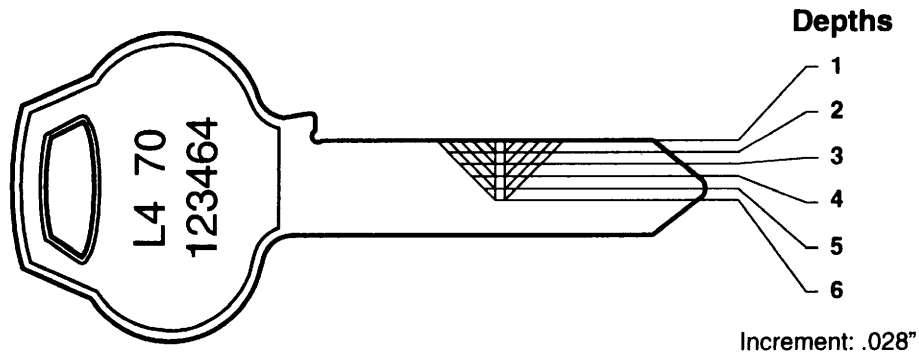
Other factors which reduce the number of combinations available include:

- excessive levels of keying
- most cross keying
- selective master keys
- construction master keying
- interchangeable core cylinders
- mixing conventional cylinders with high security or master ring cylinders
- using Brink or blockout function cylinders

If any of these features are or will be required in a keying system, **they must be specified from the very start. If not, it is seldom possible to integrate them later.**

Depth Systems and Master Keying Capacity

System 70



All cuts are read and written Bow to Tip

System 70 master key systems use *single step* progression. That is, they don't have to skip numbers within a pin chamber because one System 70 increment already equals two Pre-System 70 increments. All System 70 bittings are read and written bow to tip.

In order to determine how many theoretical keys are available at each level of keying in a multi-level keying system, use the number of progressives in each chamber as the multiplier. In the case of System 70, the multiplier is 5.

On the next page, we illustrate a grand master key system first. There are three levels of keying, but you only have to work for two of them. The top master key -- in this case, the GMK -- is the key you start with, so it is not progressed. Divide the key into two pieces: one for each level of keying progressed under the GMK: the masters and changes.

Given a 6-pin cylinder with one keyway, there are only three possible ways to divide the key for masters and changes. They are shown on the facing page. The positions of the key used for any one level of keying will vary from system to system. In other words, in the first illustration, the key is divided into a piece with one cut and another piece with the remaining five cuts.

Key Bitting Array

TMK (top master key)	1	2	5	4	6	3	
	2	3	6	5	1	4	
	3	4	1	6	2	5	
Progression Possibilities	4	5	2	1	3	6	
	5	6	3	2	4	1	
	6	1	4	3	5	2	

5 numbers remain in each column. Only the TMK is omitted.

A 6-pin cylinder has 5^6 theoretical changes: 15,625 total per keyway. 5-pin keying systems have 5^5 (3,125) and 7-pin keying systems have 5^7 (78,125) theoretical changes per keyway using total position progression. When the rotating constant method is used, this math does not apply.

Construction master keying and special cylinders such as interchangeable core, blockout and Brink function cylinders require certain bittings to be removed from the key bitting array, reducing the system's potential size. See those specific parts of this manual for details.

We show the one cut devoted to masters in the first position, but it could occur in any position. The remaining four cuts, wherever they are, are used for change keys.

Using keyways to expand a master key system is a topic far too advanced to present in the space available here. The general rules are:

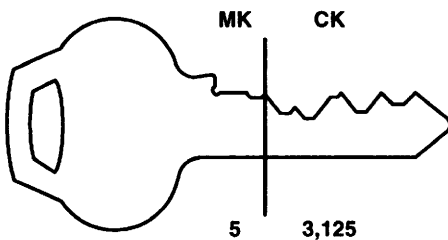
- Each keyway can be divided differently, if necessary.

- If you divide all keyways the same way, you can multiply any ONE level of keying by the number of keyways used. For example, to obtain 100 change keys under each master in the last illustration, use four keyways. ($4 \times 25 = 100$.) All masters, grands and the great grand must then be cut on the multi-section key which will enter all four keyways.

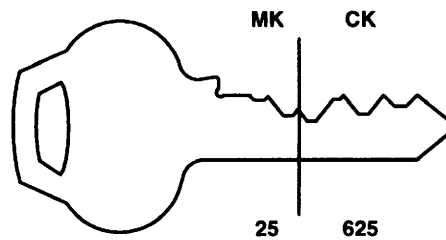
Depth Systems and Master Keying Capacity

System 70

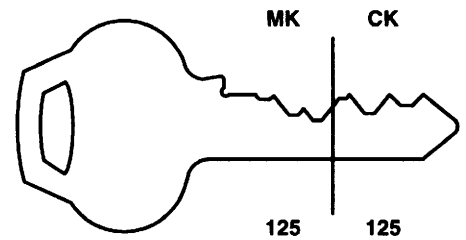
Grand Master Key System



One cut provides 5 theoretical masters under the grand. The remaining five cuts provide $5 \times 5 \times 5 \times 5 \times 5 = 3,125$ change keys under each master.



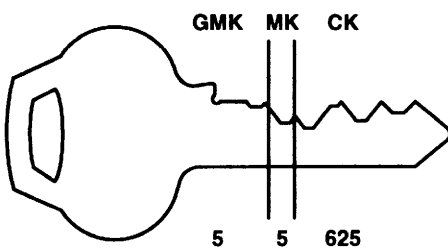
Two cuts give $5 \times 5 = 25$ theoretical masters under the grand. The remaining four cuts give $5 \times 5 \times 5 \times 5 = 625$ theoretical change keys under each master.



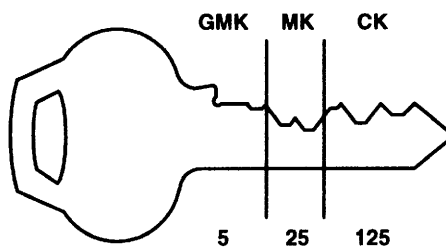
Three cuts give $5 \times 5 \times 5 = 125$ keys at each level.

Great Grand Master Key System

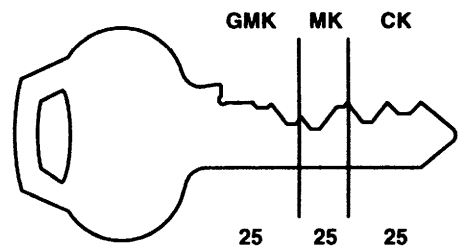
For a great grand master key system (4 levels of keying) you must divide the key into three pieces. As we saw above, the top master key is not progressed. You only have to work for the three levels below the great grand. Again, there are only three possible ways to divide the key, but remember that the location of the chambers devoted to each level will vary from one system to another. The examples illustrated use only one keyway. Most great grand master key systems use additional keyways in a multiplex key system.



One chamber gives 5 grands under the GGMK. One chamber gives 5 masters under each grand. The remaining four chambers give $5 \times 5 \times 5 \times 5 = 625$ theoretical changes under each master.



One chamber gives 5 theoretical grands under the GGMK. Two chambers give $5 \times 5 = 25$ theoretical masters under each grand. The remaining three chambers give $5 \times 5 \times 5 = 125$ theoretical changes under each master.

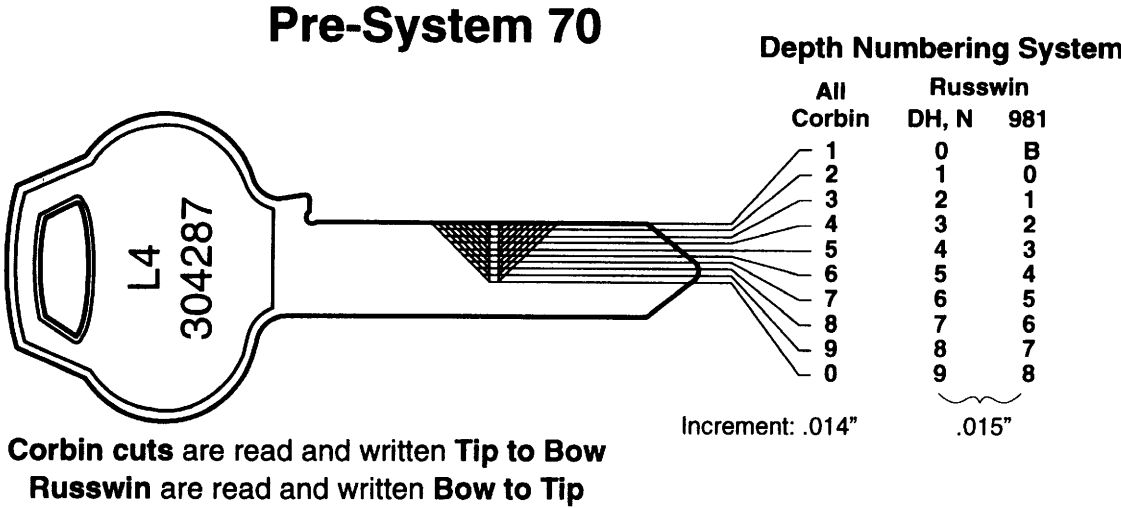


Two chambers used for each level give $5 \times 5 = 25$ theoretical combinations at each level.

The dividing lines between the cuts of the keys shown above should be considered as brick walls built to separate the levels of keying. These walls are built at the beginning of each keying system and are not movable. For instance, if you have a 3-level system laid out as shown in the second illustration and you use up all 25 master keys, you cannot dip into the third chamber to obtain a 26th master key. This would create key interchange. If you have a multiplex key system with additional keyways available, you must use a new keyway to get the new master key.

You must specify system expansion with the most accurate guess at the outset of each new keying system in order for new combinations to be available when you need them.

Depth Systems and Master Keying Capacity



Pre-System 70

The increment between depths is so small that there would be key interchange if two keys within the same master key system only differed by one depth. That is, both a 1 and a 2 must not be used together in the same pin chamber in the same keying system. Therefore, Pre-System 70 requires "two step progression" for master keying. The cuts must be at least two increments (a total of .028" or .030") apart to provide enough locking from one key to the next. Thus, only odd depths or even depths are used within any one pin chamber (unless you have master ring cylinders).

3	4	0	2	1	5	TMK (top master key)
1	1	1	1	1	1	
2	2	2	2	2	2	
3	3	3	3	3	3	
4	4	4	4	4	4	Forbidden numbers are lined out.
5	5	5	5	5	5	TMK bittings are also normally omitted from change keys.
6	6	6	6	6	6	
7	7	7	7	7	7	
8	8	8	8	8	8	
9	9	9	9	9	9	
0	0	0	0	0	0	

Key Bitting Array

TMK (top master key)	3	4	0	2	1	5	
Progression Possibilities	5	6	2	4	3	7	Only 4 numbers remain in each column.
	7	8	4	6	5	9	
	9	0	6	8	7	1	
	1	2	8	0	9	3	

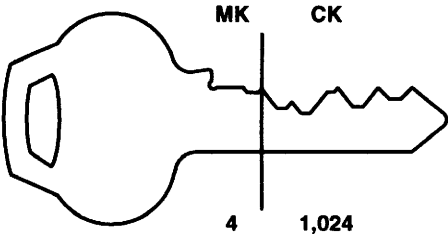
A 6-pin cylinder has 4⁶ theoretical changes: 4,096 total per keyway. 5-pin keying systems have 4⁵ (1,024) and 7-pin keying systems have 4⁷ (16,384) theoretical changes per keyway using total position progression. When the rotating constant method is used, this math does not apply.

Construction master keying and special cylinders such as interchangeable core, blockout and Brink function cylinders require certain bittings to be removed from the key bitting array, reducing the system's potential size. See those specific parts of this manual for details.

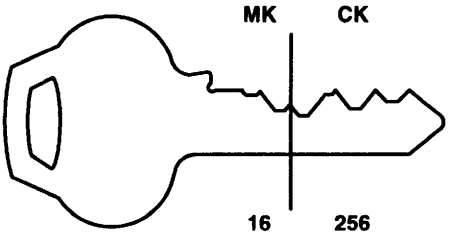
Depth Systems and Master Keying Capacity

Pre-System 70

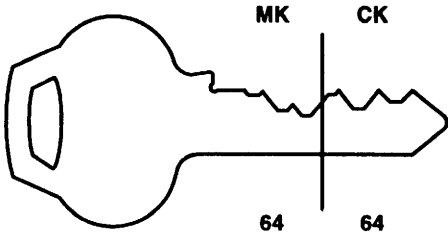
Grand Master Key System



One cut allows for 4 theoretical masters under the grand. The remaining five cuts allow for $4 \times 4 \times 4 \times 4 \times 4 = 1,024$ change keys under each master.



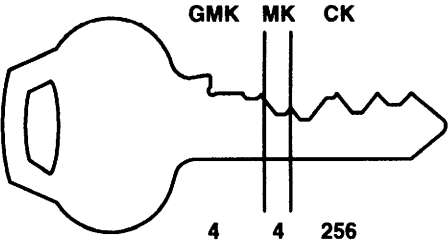
Two cuts give $4 \times 4 = 16$ theoretical masters under the grand. The remaining four cuts give $4 \times 4 \times 4 \times 4 = 256$ theoretical change keys under each master.



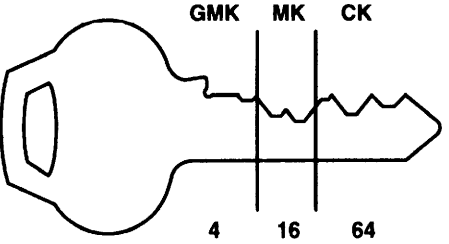
Three cuts give $4 \times 4 \times 4 = 64$ keys at each level.

Great Grand Master Key System

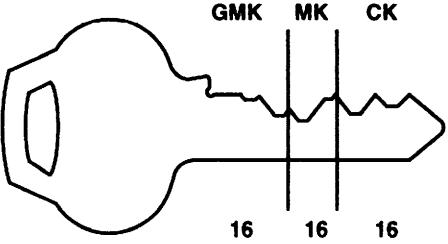
For a great grand master key system (4 levels of keying) you must divide the key into three pieces. As we saw above, the top master key is not progressed. You only have to work for the three levels below the great grand. Again, there are only three possible ways to divide the key, but remember that the location of the chambers devoted to each level will vary from one system to another. The examples illustrated use only one keyway. Most great grand master key systems use additional keyways in a multiplex key system.



One chamber gives 4 grands under the GGМК. One chamber gives 4 masters under each grand. The remaining four chambers give $4 \times 4 \times 4 \times 4 = 256$ theoretical changes under each master.



One chamber gives 4 theoretical grands under the GGМК. Two chambers gives $4 \times 4 = 16$ theoretical masters under each grand. The remaining three chambers give $4 \times 4 \times 4 = 64$ theoretical changes under each master.



Two chambers used for each level give $4 \times 4 = 16$ theoretical combinations at each level.

The dividing lines between the cuts of the keys shown above should be considered as brick walls built to separate the levels of keying. These walls are built at the beginning of each keying system and are not movable. For instance, if you have a 3-level system laid out as shown in the second illustration and you use up all 16 master keys, you cannot dip into the third chamber to obtain a 17th master key. This would create key interchange. If you have a multiplex key system with additional keyways available, you must use a new keyway to get the new master key.

You must specify system expansion with the most accurate guess at the outset of each new keying system in order for new combinations to be available when you need them.

Unit 1 — Required Reading

Depth Systems and Master Keying Capacity

Very Old Russwin

This information is only for three key classes: 752, 852 and A. All use the narrow .325" blade keys and the factory no longer generates new systems with them. The depths are labeled 0 (shallowest) through 6 (deepest.) However, the starting point of the zero depth is different for each. To extend exhausted systems, a "B" depth shallower than zero is possible for 852 class.

The increment is .020". A #1 master pin would be too thin for practical use, so change keys must stay at least 2 increments away from the TMK. However, change keys may differ from each other by only 1 increment, provided they are not cross keyed together.

The MACS published for these key classes for the field is 5 but the factory can cut keys with adjacent cuts of 06 and 60.

1	6	0	3	6	0	TMK (top master key)
0	0	0	0	0	0	Forbidden numbers are lined out. TMK bittings are also normally omitted from change keys.
1	1	1	1	1	1	
2	2	2	2	2	2	
3	3	3	3	3	3	
4	4	4	4	4	4	
5	5	5	5	5	5	
6	6	6	6	6	6	

Key Bitting Array

TMK (top master key)	1	6	0	3	6	0	Some columns have 4 while others have 5 progressives available.
Progression Possibilities	3	0	2	5	0	2	
	4	1	3	6	1	3	
	5	2	4	0	2	4	
	6	3	5	1	3	5	
	4	6		4	6		

In this example, there are $4 \times 5 \times 5 \times 4 \times 5 \times 5$ (10,000) theoretical change keys per keyway. When the rotating constant method is used, this math does not apply. There is no uniform formula for determining the number of theoretical changes in these old key classes because the number of progressives is not the same in all columns of the key bitting array. Columns with 0 or 6 in the TMK yield 5 progressives while the others yield only 4. This is why TMKs in these key classes often used 0's and 6's. Beginning in 1909 all factory TMKs ended in 0.

Plug Diameters

Plug diameter affects two aspects of cylinder servicing:

1. Choosing of the correct size bottom pin (and build-up pin, if required)
2. Changing plugs in cylinders whose plug diameters differ, based on the date of manufacture.

If you routinely service Corbin Russwin products, you will quickly learn to recognize the two diameters on sight.

It is not necessary to memorize which products use which diameters, but it is important to know that the usage has changed over the years, and the same keying system may use both plug diameters.

A Historical Perspective

Corbin Russwin still maintains keying systems in thousands of very old buildings, so locksmiths encounter old and new cylinders daily. The use of the two plug diameters can seem very confusing, so we are providing this background information.

Stage 1

Until 1959, each brand had its own plug diameter. All Corbin was .509" and Russwin was .552" except padlocks, which were made by the Corbin Cabinet Lock Division.

Stage 2

In 1959, Corbin Z Class keyways appeared. They used the same plugs as Russwin, while the older X Class continued to use .509" for everything.

Stage 3

In 1964, the round interchangeable core cylinder was born, followed in 1971 by the modern figure-8 version. Both use .509" regardless of the keyway.

Stage 4

In 1983, Corbin X Class changed to .552" to join the rest of the cylinder line -- with the continued exception of padlocks and interchangeable cores. One cylinder didn't make this transition and became a new exception: master ring cylinders for CK4200 and UT5200 series locksets.

Stage 5

Beginning with the design of the CK4400 Series cylindrical locks, introduced in 1986, it became evident that .509" allowed an easier fit into the industry's more traditional knob, lever and spindle designs, so it was decided that *new* products would use the .509" plug regardless of key class. Existing products kept whichever plug diameter they had been using.

Today, still in Stage 5, the *product* determines the plug diameter, as follows:

.552" Diameter

All high security cylinders
All other cylinders not listed as
.509" below

.509" Diameter:

CL Series key-in-lever cylinders
Conventional interchangeable core
CK4400 Series key-in-knob cylinders
PL5000 Series padlocks
X Class master ring cylinders for
CK4200 and UT5200 Series
All Corbin X Class keyway cylinders
before 1983

Stage 6

The future. Corbin Russwin plans to standardize on the .509" plug for all cylinders except high security.

Summary

We have now presented all key classes, depth systems and plug diameters. Appendix A ties this information together by detailing all key biting specifications and pin lengths. If you are maintaining one keying system, you will only need one page of Appendix A. You will then have two sets of pins to deal with. They correspond to the two plug diameters within your particular key class and depth system.

Most older pin kits supported only one plug diameter and are not adequate for servicing today's products. The C6 and R6 kits introduced in 1986 and the PK Series kits introduced in September 1993 eliminate this problem. See catalog for details of current offering and Unit 4 for details of older kits.

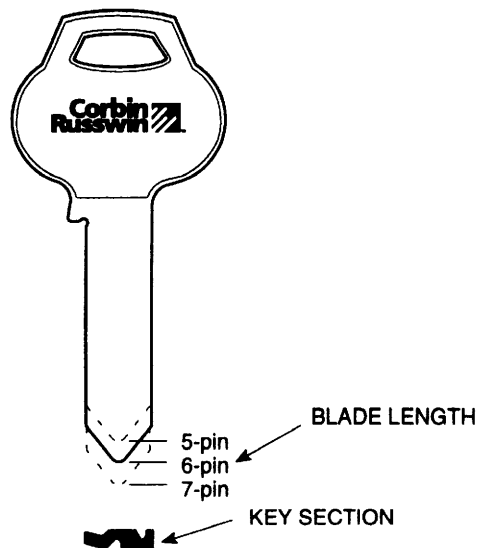
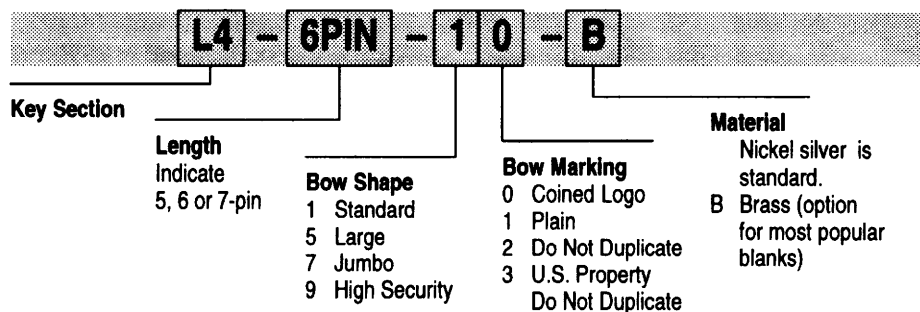
Unit 2 — Keys

Key Blanks

There are three components to a key blank:

- Key Section
- Blade Length
- Bow Shape & Marking

All of these must be clearly defined when ordering Corbin Russwin key blanks. Follow the example at the right.



Key Section

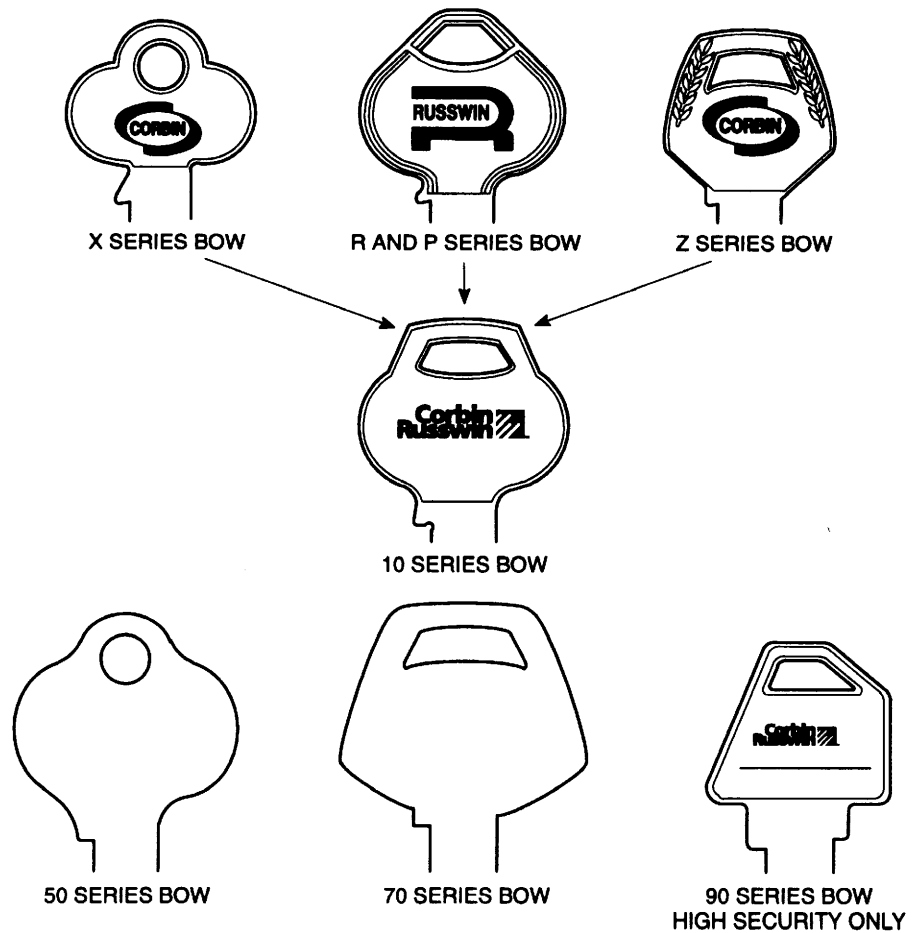
This is the cross section of the key blade, viewed from bow to tip. Non-restricted key sections and keyways are shown in the next section of this manual.

Important: When dealing with a multiplex key system, *never cut keys onto a higher level key blank than necessary*. Doing so will destroy the integrity of the keying system by limiting expansion and/or creating key interchange!

Blade Length

5-pin, 6-pin and 7-pin keying systems each require key blanks of the proper length. You can determine the length by counting the number of cuts in the key, the number of loaded chambers in the cylinder, or comparing the key with the illustration above.

Key Blanks

**Bow Shape and Marking**

Consult the latest Corbin Russwin catalog or price book for the current offering of optional key bows and special stamping.

The traditional Corbin X, Corbin Z and Russwin bows are being discontinued in favor of the new unified Corbin Russwin 10 Series bow.

Other Specifications

Material and special indications for the tip of hotel emergency key blanks are added at the end of the regular number. The most popular key blanks are available in brass. See the pages of Unit 3 devoted to hotel function cylinders for the EMK blank specifications.

Using Non-Original Blanks

There are several manufacturers of aftermarket key blanks. Many of these blanks, when cut to Corbin Russwin biting specifications (Appendix A), operate properly in Corbin Russwin cylinders. There are occasional problems, however, when blanks deviate too much from original Corbin Russwin specifications.

The most common problems occur with X Class keys. Either they do not have a proper radius on the bottom of the blade, or they have a bottom shoulder which interferes with the cylinder face.

For best results, always use original Corbin Russwin key blanks. A cross reference is provided in Appendix C to determine the original Corbin Russwin key section and blade length from a non-original key blank number.

Keyways and Key Sections

Terminology

In order to introduce this section, five definitions from Appendix E will be paraphrased:

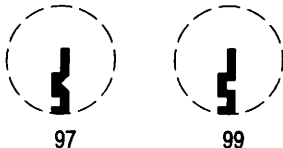
A *keyway* is the shape of the slot which the key enters. A *key section* is the cross section of the key blade. Each keyway has a corresponding key section and there are thinner key sections (*multi-section keys*) which enter more than one keyway.

A *multiplex* key system is a family of keyways and key sections designed to be tied together in a large master key system. A *simplex* keyway or key section stands by itself. It is not part of a multiplex system.

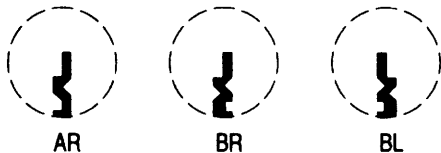
Simplex Keyways

98 was Corbin’s first pin tumbler keyway, dating from 1888. Cylinders with this simplex keyway are still in use. Since it is obsolete it is not shown here. See page 75 for specifications.

Most of Corbin Russwin’s keyways are multiplex, but there are a few simplex keyways. Russwin has two: 752 and G. They are presented later in the Russwin section. Corbin’s six non-restricted simplex keyways are presented here. They are available 5, 6 and 7-pin, while Russwin’s are 5-pin only.



97 and 99 keyways are X Class. 99 was introduced in 1895 and 97 in 1908. The first keying systems on these keyways were 4-pin, but 5-pin soon became the standard. 6-pin is today’s standard and 7-pin is optional.



AR, BR and BL are X Class, introduced around 1914. BR and BL are the reverse of each other. All three of these keyways are extremely rare, so they are highly recommended for new keying systems which only require one keyway, but a great deal of regional exclusivity. 6-pin is standard and 7-pin is optional.

These are Corbin’s only “lettered” keyways, so be aware that key blank catalog numbers have the normal format, but look unusual. Example: AR-6PIN-10.

P & F Corbin’s AR, BL and BR are often confused with keyways of the same names used by Corbin Cabinet Lock, formerly a sister company. This can lead to errors in ordering. An example of a CCL key blank number is 4193C-AR.

CCL’s keyways are totally unrelated, so it is important to determine which company’s product is involved if you have a request for one of these keyways.

Corbin Russwin does not support the CCL keyways and CCL does not support Corbin Russwin keyways. Each product must be ordered from its respective manufacturer.

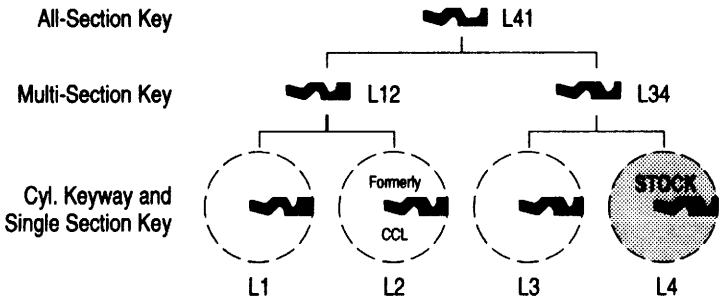


70 is the reverse of 60. It uses Z Class biting specs and was the original stock keyway for the Emhart high security cylinder. It is very uncommon, making it a good candidate for new keying systems which require only one keyway, but need some regional exclusivity.

L2 had been introduced as a simplex keyway in 1975 for Corbin Cabinet Lock’s limited line of architectural hardware. These keys and cylinders only bore the Emhart brand name. When the CCL Division was sold, L2 remained with Corbin and Russwin.

With the merging of the Corbin and Russwin brands in May 1993, L2 was expanded into a 4-keyway multiplex system. L4 replaced 60 and D1 as the stock keyway at that time.

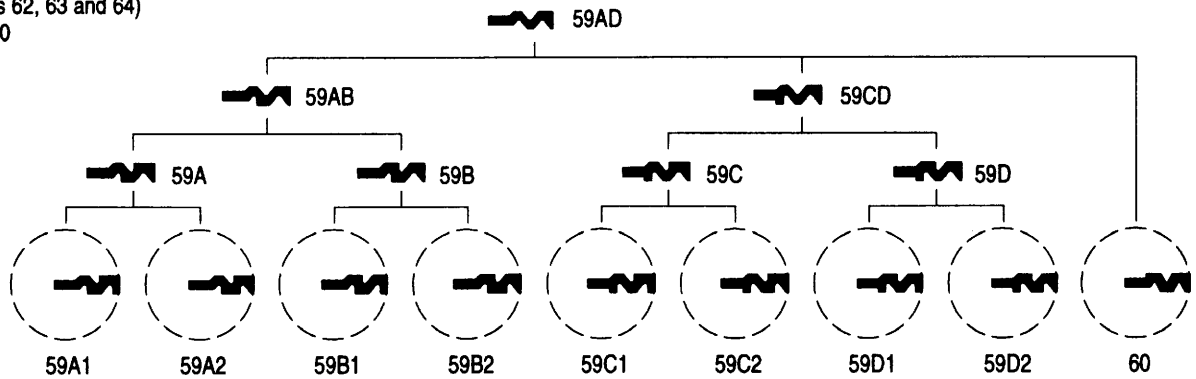
Available 5, 6 and 7-pin
Z Class biting (pages 62, 63 and 64)
Reverse of Russwin D Series



Corbin 59 Series Keyways

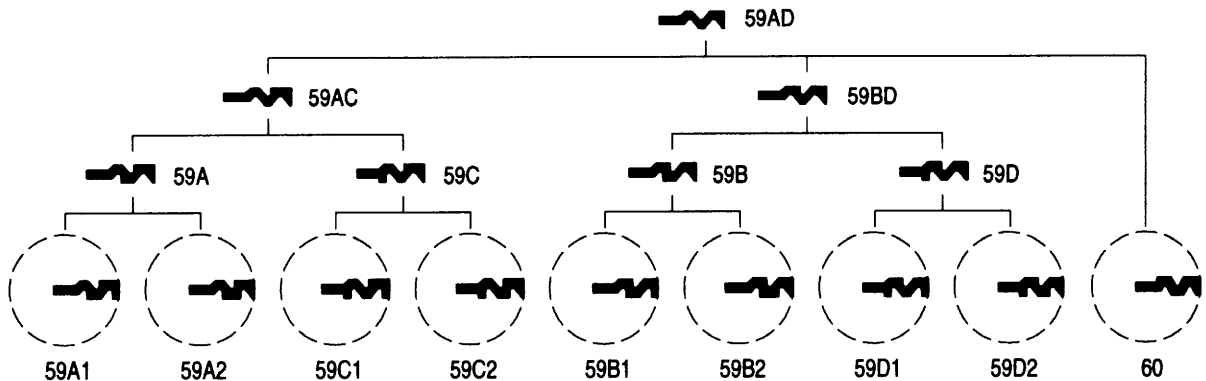
The 59 Series keyways were introduced in 1959. Notice that the multiplex key system incorporates 60, which replaced 77 as Corbin's stock keyway in 1960. A master key system originated on 60 keyway can be expanded beyond its original scope, although it requires issuing the all-section key to do so.

Available 5, 6 and 7-pin
 Z Class bitting (pages 62, 63 and 64)
 60 is the reverse of 70



59 Series Alternate Structure

This structure is useful when a keying system expands in directions different from those originally anticipated. It may not be specified for new systems.



Unit 2 — Keys

Corbin 57 Series Keyways

This multiplex system began with just 57A and B group in 1930. The C's were added in 1963 and the D's in 1968.

There is no 57CD multi-section key available. Milling such a combination would result in the 57AD all-section key.

Original jobs on all X class keyways were done with **Pre-System 70 depths**

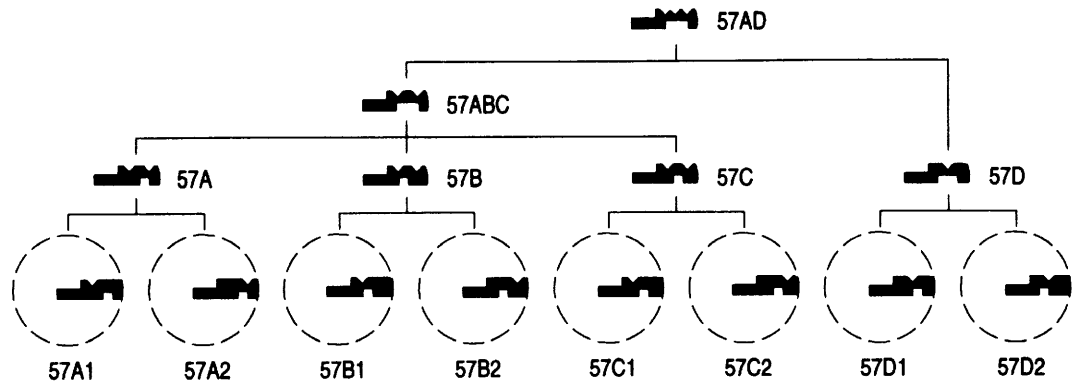
read and written **TIP to BOW!** Most jobs and stock cylinders furnished on these keyways since 1970 use System 70 depths (always bow to tip.) See Appendix A for complete key bitting and pin length specifications.



Available 5, 6 and 7-pin
X Class bitting (pages 66 and 67)

Reverses:

57A1	27B2
57A2	27B1
57B1	27A2
57B2	27A1



Corbin 27, 67 and 77 Series Keyways

Structure

All three of these multiplex systems are laid out identically. They share a peculiar feature. Each has a keyway which was the stock keyway at one time or another. The key section for that keyway (27, 67 and 77) also enters a pair of lower level keyways (28–29, 68–69 and 78–79, respectively.)

This is highly unusual in multiplex key systems and the use of the lower pair of keyways is avoided today, due to the ready availability of the 27, 67 and 77 key sections wherever keys are duplicated.

The A1, A2, B1 and B2 keyways in these groups were added later and follow a more logical multiplex structure.

History:

27 replaced 97 as Corbin's stock keyway around 1924. 28 and 29 were added in 1926. 27A1 was added in 1930. The rest were added in 1963.

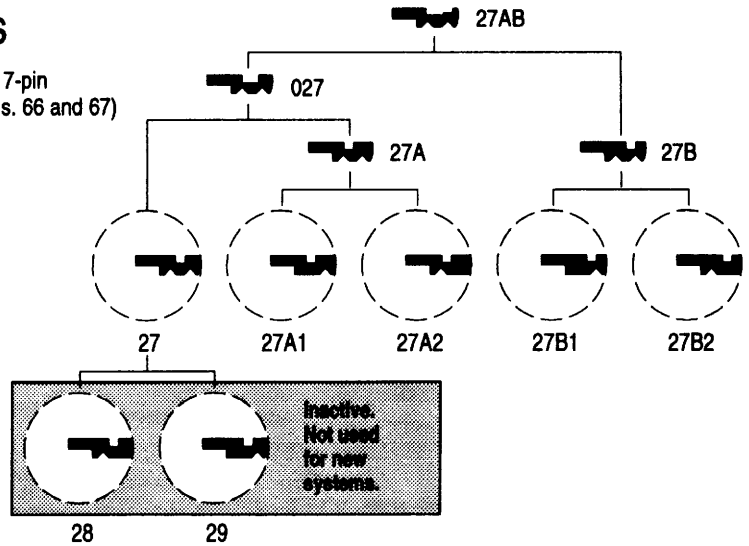
67 replaced 27 as the stock keyway in 1936. 68 and 69 were added in 1938. 67A1 was added in 1942. The rest were added in 1963.

77 replaced 67 as the stock keyway in 1951. 78 and 79 were added in 1954. 77A1 was added around 1958. The rest were added in 1963.

Original jobs on all X class keyways were done with Pre-system 70 depths read and written **TIP to BOW**. Most jobs and random keyed cylinders furnished on these keyways since 1977 use System 70 depths notated bow to tip. See Appendix A for complete key bitting and pin length information.

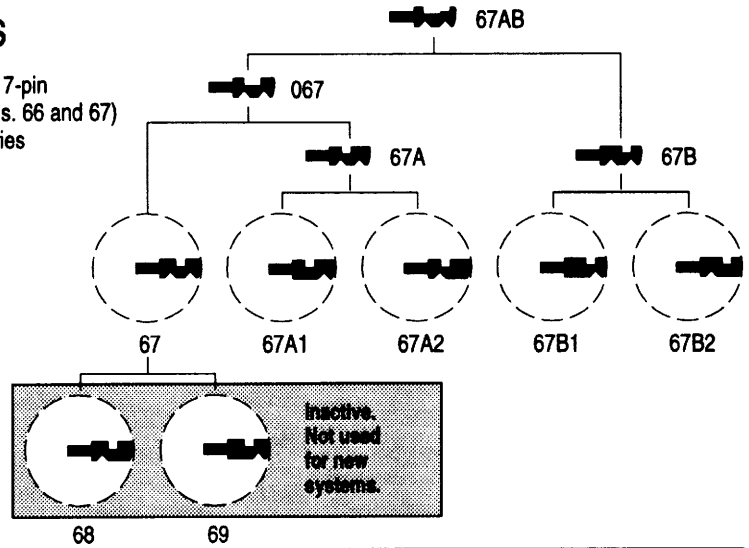
27 Series

Available 5, 6 and 7-pin
X Class bitting (pgs. 66 and 67)
Reverses:
27A1 57B2
27A2 57B1
27B1 57A2
27B2 57A1



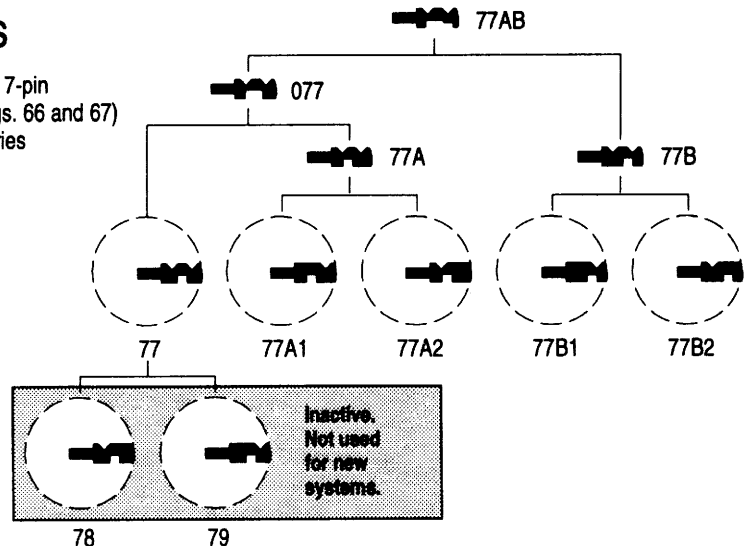
67 Series

Available 5, 6 and 7-pin
X Class bitting (pgs. 66 and 67)
Reverse of 77 Series



77 Series

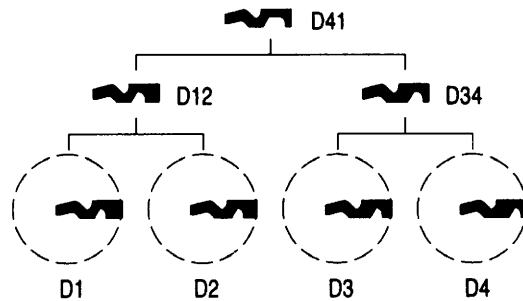
Available 5, 6 and 7-pin
X Class bitting (pgs. 66 and 67)
Reverse of 67 Series



Ruswin D and H Series Keyways

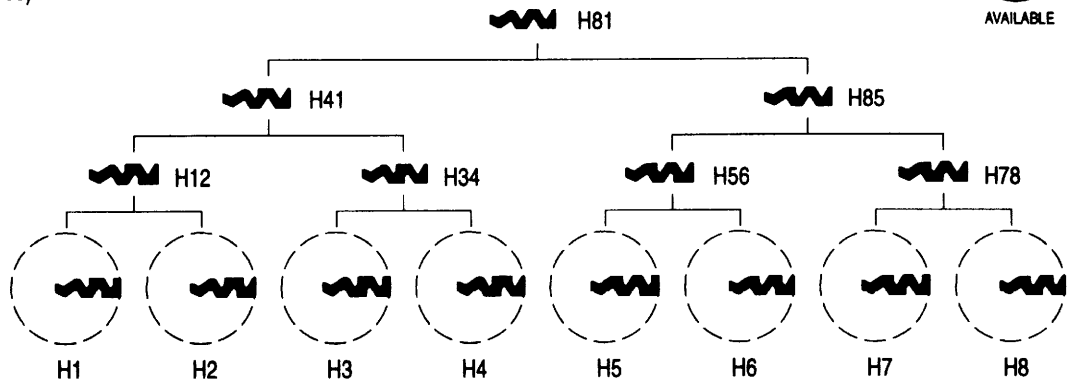
These keyways were introduced in 1965, when D1 replaced 981 as Russwin's stock keyway.

Available 5, 6 and 7-pin
DH Class bitting (pages 62, 63 and 65)
Reverse of L Series



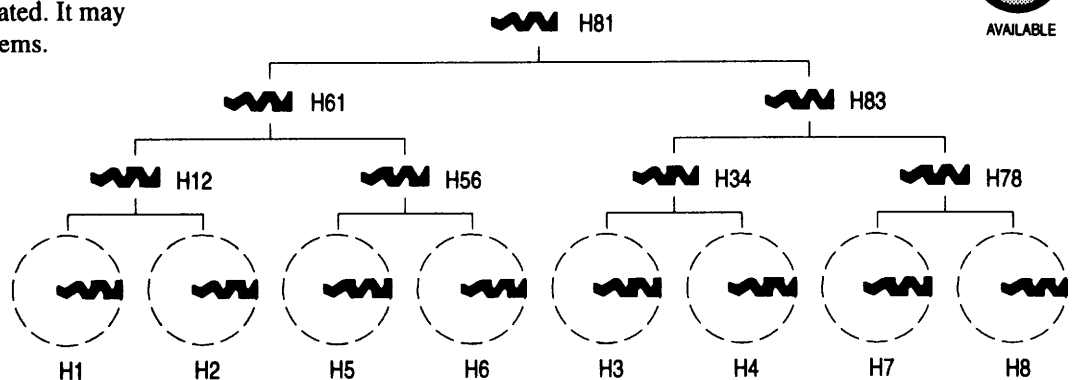
H Series Standard Structure

Available 5, 6 and 7-pin
DH Class bitting (pages 62, 63 and 65)



H Series Alternate Structure

This structure is useful when a keying system expands in directions different from those originally anticipated. It may not be specified for new systems.



Ruswin 981, 852 and 752 Classes (Inactive)

Ruswin 981 Class

981 was Ruswin's stock keyway from 1938 to 1965, following 852 and followed by D1. It is still common in older residential applications and small commercial master key systems. When a keying system expands beyond 981, the 982 and 983 keyways are used.

981 class began as a 9-depth system. The shallowest was 0 and the deepest was 8. When "exhausted" master key systems had to be extended, a cut *shallower than zero* was created and labeled "B".

Caution: Do not use DH or N Class depths to cut 981 Class keys! See page 70.

Like other Ruswin keyways, this multiplex group changed its name for

5-pin, 6-pin and 7-pin variations. This practice was stopped in 1993 to conform to a single standard name for each keyway.

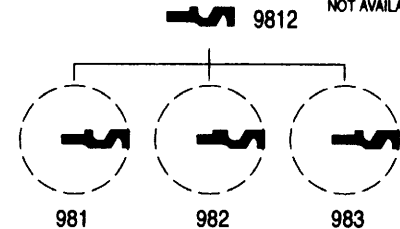
Since 5-pin was the most common, Corbin Ruswin has standardized on the names 981, 982 and 983 for these keyways. The old names are shown for reference only, together with the biting prefixes.

Caution: 5-pin cylinders used a "guard pin" in the 6th chamber for many years, requiring a #4 cut in the 6th position of 5-pin keys. If you do not make the guard cut on the key, it will not work in a cylinder with a guard pin.

HIGH SECURITY



NOT AVAILABLE



Bitting Prefixes

5-pin		6-pin		7-pin	
R	981	V	961	L	971
S	982	W	962	1L	972
T	983	X	963	2L	973
RS	9812	VW	9612	L1L	9712

Ruswin 852 Class

852 was Ruswin's stock keyway from about 1912 to 1938, following 752 and followed by 981.

252 is used to extend master key systems established on 852. 5-pin is standard and 6-pin is rare. G is a very rare simplex keyway. G keys are available 5-pin only.

The shallowest cut is normally a 0 and the deepest is a 6. However, a B depth is possible above the 0 to extend exhausted systems.

No new systems are generated in 852 Class keyways. They are supplied only to support existing systems.

The keyways in the 852 Class have their own bitting and pin length specifications. See page 71.

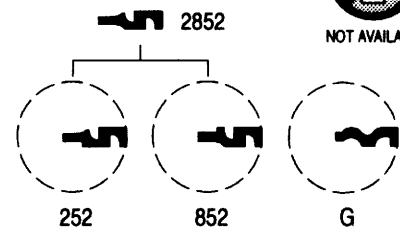
Caution: 5-pin cylinders used a "guard pin" in the 6th chamber for many years, requiring a #4 cut in the 6th position of 5-pin keys. If you do not make the guard cut on the key, it will not work in a cylinder with a guard pin.

HIGH SECURITY



NOT AVAILABLE

5-pin standard, 6-pin special.



Bitting Prefixes

252	2
852	8
2852	28
G	G

Ruswin 750 Class (obsolete)

This simplex keyway was Ruswin's first pin tumbler keyway for mortise cylinders, dating from around 1899. It used 5 cuts with *special spacing* on a 7-pin blank (see page 75.)

A normal length version was used for early rim cylinders. It was called 751, not to be confused with the 751 keyway used recently for residential knob locks. Both 750 and 751 had a diamond shaped bow and are now obsolete.

Ruswin 752 Class

752 was Ruswin's stock keyway from shortly after 1900 until 1912, following 750/751 and followed by 852. In 1961, the keyway was resurrected as Safe Hardware's stock keyway (KB7525) until Safe was closed in 1981. 752 originally had a cloverleaf bow. Safe used it with round and oval bows. See page 73 for key bitting specs.

Available 5-pin only.



750, 751, 752

HIGH SECURITY



NOT AVAILABLE

Bitting Prefixes First Cut

752	7	.250"
750	J	.481"
751	H	.245"

Unit 2 — Keys

Ruswin N Series Obverse Keyways (Inactive)

These keyways became inactive for new jobs in 1993. The obverse keyways were introduced about 1938 to replace the A Series keyways and roughly paralleled the use of 981 as Ruswin's stock keyway.

These old multiplex keyways weren't designed with the logic of today's keyways. Multi-section keys were

obtained simply by double, triple or quadruple milling key sections onto the same blank, which often allowed key sections to enter additional keyways for which they were not intended.

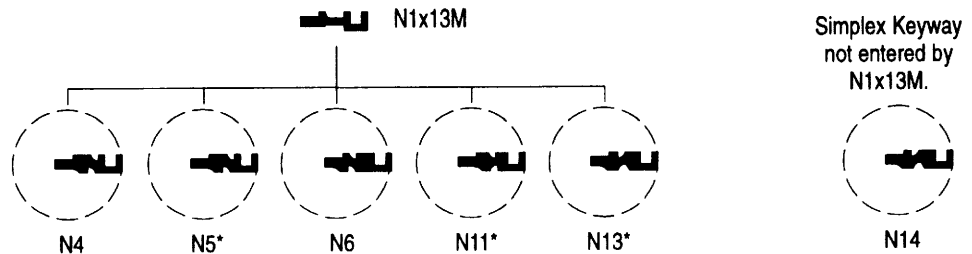
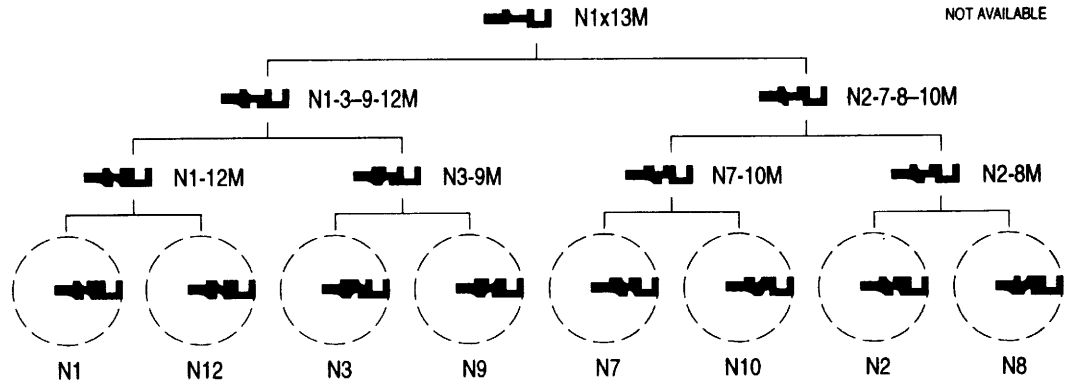
An engineering study of these keyways in 1969 led to the schematics shown here for the final years of new N Class keying systems. Older systems in the

field will not necessarily adhere to this structure. The Key Records Department should always be consulted before attempting to introduce a new keyway into an existing system.

Caution:
Do not use DH Class specs to cut N Class keys or pin N Class cylinders!

Available 5, 6 and 7-pin
N Class bitting (pages 68 and 69)
Reverse of N15 – N28
No new keying systems.

Former Designations:
1N – 14N 6-pin
1K – 14K 5 and 7-pin



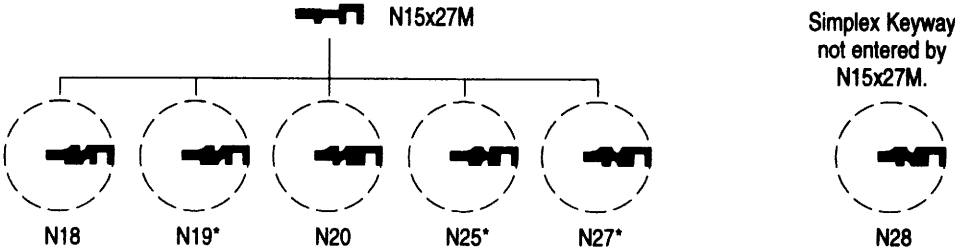
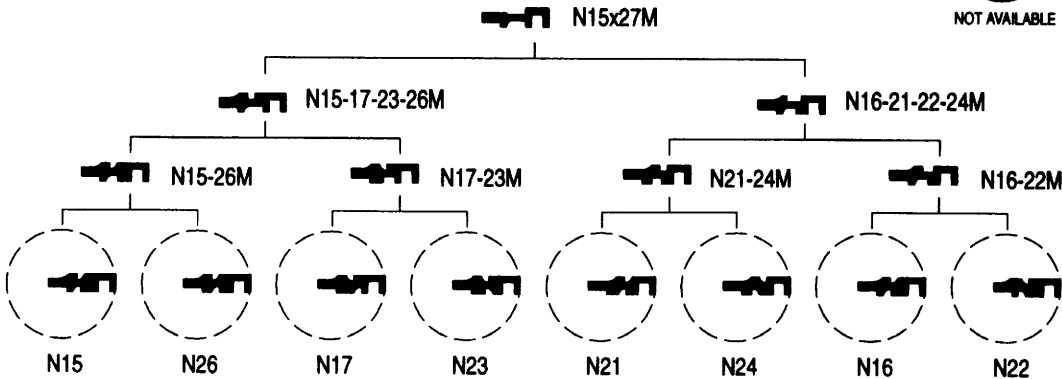
* **Caution:** Do not use these pairs in the same keying system with each other:

- N1 with N13
- N3 with N5
- N7 with N11

Ruswin N Series Reverse Keyways (Inactive)

Available 5, 6 and 7-pin
 N Class bitting (pages 68 and 69)
 Reverse of N1 – N14
 No new keying systems.

Former Designations:
 15N – 28N 6-pin
 15K – 28K 5 and 7-pin



*** Caution:** Do not use these pairs in the same keying system with each other:
 N15 with N27
 N17 with N19
 N21 with N25

Ruswin A Series Keyways (Inactive)

These keyways were used for special or very large jobs from about 1907 to 1938, during the time when 752 and later 852 were Ruswin's stock keyways.

These keyways were not designed with the logic of today's keyways. Multi-section keys were obtained simply by double, triple or quadruple milling key sections onto the same blank, which often allowed key sections to enter additional keyways for which they were not intended.

Illustrated here are the most secure multiplex relationships among the obverse keyways by today's standards. Older systems may not adhere to this structure. The reverse keyways are quite rare and were seldom used in multiplex key systems. The Key Records Department should always be consulted before adding a new keyway into an existing system.

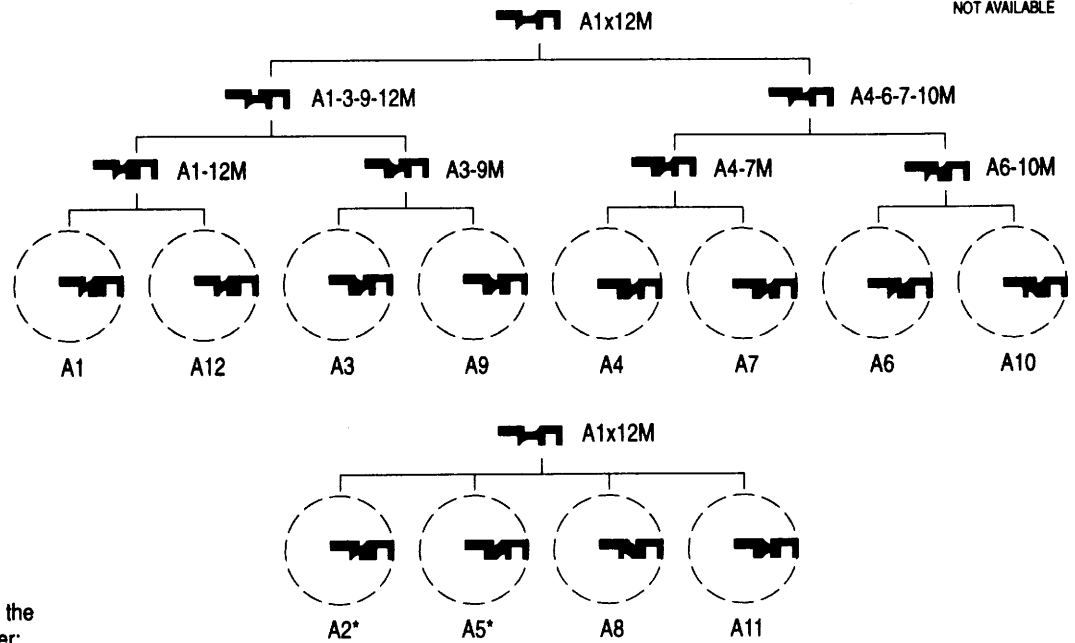
These keyways use seven depths. 0 is the shallowest and 6 is the deepest. The increment is .020".

Caution: 5-pin cylinders used a "guard pin" in the 6th chamber for many years, requiring a #4 cut in the 6th position of the 5-pin keys. If you do not make the guard cut on the key, it will not work in any cylinders with a guard pin.



Available 5, 6 and 7-pin
A Class bitting (page 72)
Obverse: A1 – A12
Reverse: A13 – A24
No new keying systems.

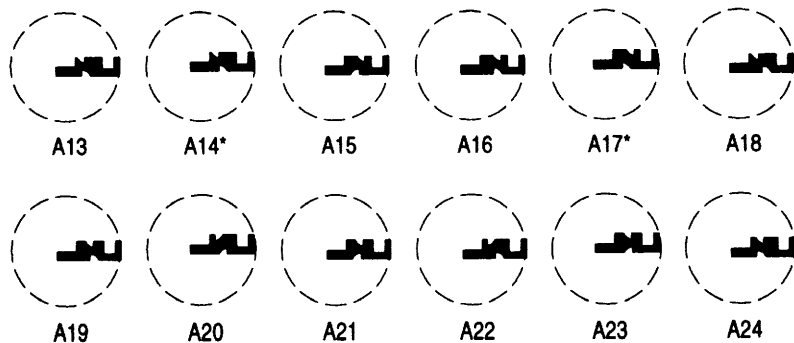
Former Designations:
1A – 24A 5-pin
1Z – 24Z 6-pin



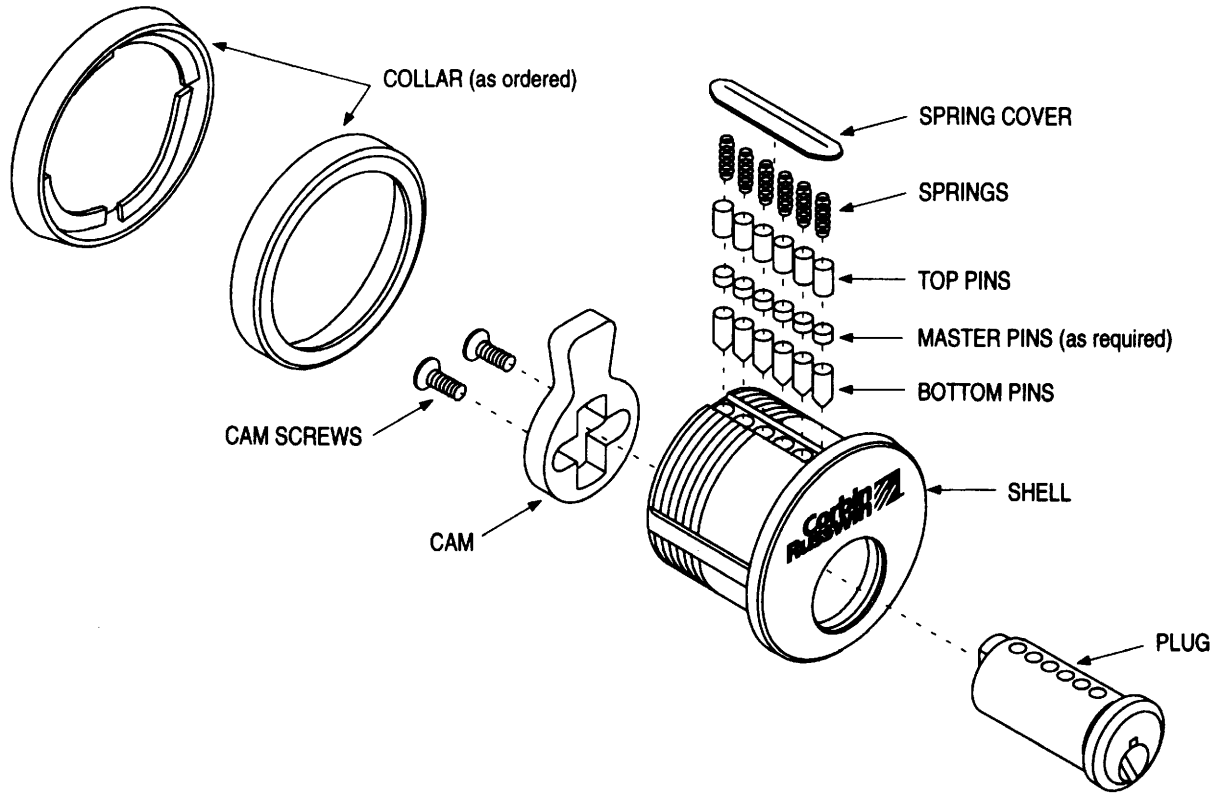
* **Caution:** Do not use these pairs in the same keying system with each other:

- A1 with A2
- A4 with A5
- A13 with A14
- A16 with A17

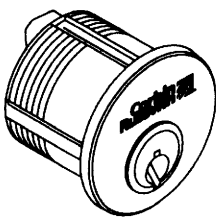
Reverse Keyways



Basic Cylinder Terminology and Construction

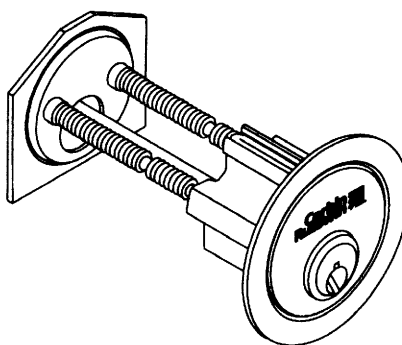


Basic Cylinder Types



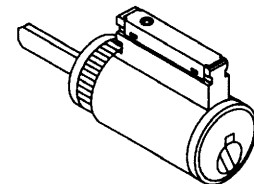
Mortise Cylinder

This type of cylinder screws into a mortise lockset and is held in place by a set screw which engages the V-notch on one side of the cylinder. In exit device trim, it may be secured with a nut from the back.



Rim Cylinder

This type of cylinder is fastened by the two mounting screws and a back plate. It is most often used on rim and vertical rod exit devices.



Key-In-Knob Cylinder

This type of cylinder comes in a wide variety of sizes and shapes. It is found in some deadlocks in addition to key-in-knob and key-in-lever locksets.

Unit 3 — Cylinder Construction and Combining

Combining Conventional Cylinders

Of the many types of cylinders covered in this manual, this is the simplest in construction and servicing. Its principles should be mastered before continuing to the more complex mechanisms.

The exploded view shows a mortise cylinder but there are many other shapes of cylinders to which this section applies. Rim cylinders and key-in-knob cylinders are the most common other shapes.

These cylinders do not require any special attention to the size of the top pins. A .171" length is used in all

chambers of all conventional cylinders and will be symbolized by the letter "T" for "top". The spring used for conventional cylinders is 493F29.

The most convenient way to combine conventional cylinders requires a tool called a *plug follower*. Followers for both diameter plugs are contained in Corbin Russwin pin kits and tool kit CT-93. They can also be ordered separately. See the catalog for current products and ordering information.

Have the bittings (key combinations) written out for all keys which are to operate the cylinder you are combining. These may come from the bitting list, from numbers stamped on the key bows or from measurements using a key gauge or other measuring device. Never file pins or plugs! Cylinders should be combined by the numbers, rather than by trial and error.

Example:

Caution:
Filed or otherwise damaged plugs should be replaced. See Appendix D for part numbers.

Name of Key	Symbol	Symbol					
Great Grand Master Key	GGM	1	2	3	4	6	4
Grand Master Key	A	3	2	3	4	6	4
Master Key	AJ	3	4	3	4	6	4
Change Key	AJ3	3	4	5	2	2	2

Normally, if you combine a cylinder to the top master key (abbreviated "TMK") and the change key, all other keys will operate automatically. This is because all intermediate level master keys will be made up entirely of cuts from the TMK or change key. In the example above, notice that each cut of A and AJ is found either in AJ3 or GGM. Your job is now simplified because you only need to look at two key bittings: those of AJ3 and GGM.

Great Grand Master Key	GGM	1	2	3	4	6	4
Change Key	AJ3	3	4	5	2	2	2

Some keying systems use selective master keys such as ENG (engineer's key), MAIN (maintenance key), JAN (janitor's key) etc. which will have one cut different from the TMK. If that key is also to operate, then its (one) special cut must be added to the numbers you write down:

Great Grand Master Key	GGM	1	2	3	4	6	4
Engineer's Key	ENG	1	6	3	4	6	4
Change Key	AJ3	3	4	5	2	2	2

In very rare cases, one of the intermediate master keys will indeed have a cut not contained in the TMK or change key. If you find this to be the case, that unique cut must also be considered. However, beware that, unless this rare case is taken from a factory generated bitting list, chances are that it is an error in your keying system and will result in key interchange!

Great Grand Master Key	GGM	1	2	3	4	6	4
Master Key	AJ	3	4	5	4	6	4
Change Key	AJ130	3	4	1	2	2	2

Combining Conventional Cylinders

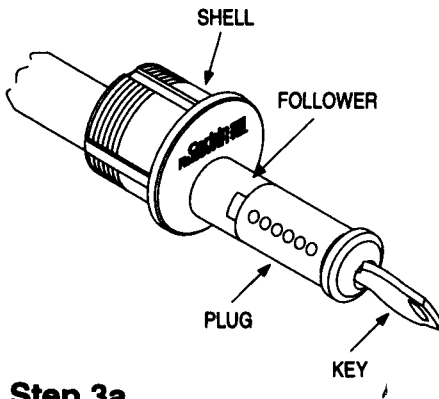
Once you have determined all bittings, you are ready to proceed with the mechanics of cylinder combining.

Step 1

Remove the plug retainer. In a mortise cylinder, this will be the cam screws and cam. Key-in-lever cylinders use a threaded cap which can be unscrewed while depressing its spring loaded detent pin. Most other cylinders use a C-clip or Waldes ring.

Step 2

Select the proper diameter follower (.509" or .552".) Insert a proper operating key and turn the plug about 45° in either direction. Place the follower against the back of the plug and gently push the plug out of its shell. The follower then holds all top pins and springs in the shell.



Step 3a

If you are rekeying a stock cylinder, you do not need to disturb the top pins and springs in the shell unless you are keying it to a 5-pin key and the cylinder came with 6-pin keys, or vice-versa. In that case, gently push the follower forward from the back end of the shell until the back chamber is exposed. Install or remove the top pin and spring. Then push the follower from the front end of the cylinder to re-center the shell on it and set it aside while you load the pins into the plug.

Step 3b

If you are rekeying a cylinder which is already master keyed, you must clear all master pins from the shell. Use a small (1/8") flat blade screwdriver or similar tool. From either end of the shell, push the follower inward slowly. As the first pin becomes exposed, press the screwdriver against it so it cannot escape. When the follower completely clears the pin, carefully ease up on the screwdriver to allow the spring to push the pin outward from its chamber.

If any master pins are in this chamber, you will see them at this point. Allow them to move out while keeping the top pin in the shell.

Each chamber must be probed. More than one chamber may contain a master pin and more than one master pin may be found in a chamber. Practice will allow you to rid the shell of all master pins quickly, chamber by chamber, while keeping the top pins and springs in place.

When you get midway into the shell it will become more difficult because you have to hold all the front pins in place and still see the material in the next chamber being exposed. When you reach this point, push the follower back toward you and proceed from the opposite end of the shell for the remaining pin chambers.

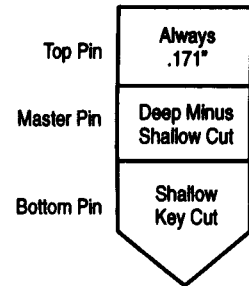
Be sure to identify weak springs or gummed up pins and replace so the cylinder will operate properly.

Step 4

Determine whether your key bittings are bow to tip (all System 70 and Russwin) or tip to bow (Pre-System 70 Corbin only). This determines from which end the pins will be loaded into the plug. We will assume a System 70 example bow to tip.

Step 5

Determine the bottom pin and master pin number for each chamber.



The bottom pin always equals the shallowest cut. Sometimes it will be in the TMK and sometimes it will be on the change key. The master pin equals the difference between the deep and shallow cuts. Remember, the top pins are a uniform .171" length and are already in the shell.

The following represents the pin stacks for our 6-pin example cylinder AJ3. The shallow key cut for each position is indicated in bold type.

TMK	1	2	3	4	6	4
Change Key	3	4	5	2	2	2
Top Pin	T	T	T	T	T	T
Master Pin	2	2	2	2	4	2
Bottom Pin	1	2	3	2	2	2

Step 6

If you are using a pin kit arranged by pin numbers, this completes the job. Leave the keys out of the plug. Load the pins into the chambers of the plug, remembering whether you are working bow to tip or tip to bow. If you only have a 5-pin system, you will be leaving the 6th chamber empty in both the plug and shell.

If you are using a pin kit with actual lengths in thousandths of an inch, you must refer to the one page of Appendix A that applies to your particular keying system. Convert the numbers to lengths and load the plug.

Unit 3 — Cylinder Construction and Combining

Combining Conventional Cylinders

For our example we will assume our keying system is Z Class System 70. We will also assume the plug diameter of our cylinder to be .509". Referring to page 46 we can determine the actual lengths of pins to load.

Top Pin	T	T	T	T	T	T
Master Pin	2 .056"	2 .056"	2 .056"	2 .056"	4 .112"	2 .056"
Bottom Pin	1 .160"	2 .189"	3 .217"	2 .189"	2 .189"	2 .189"

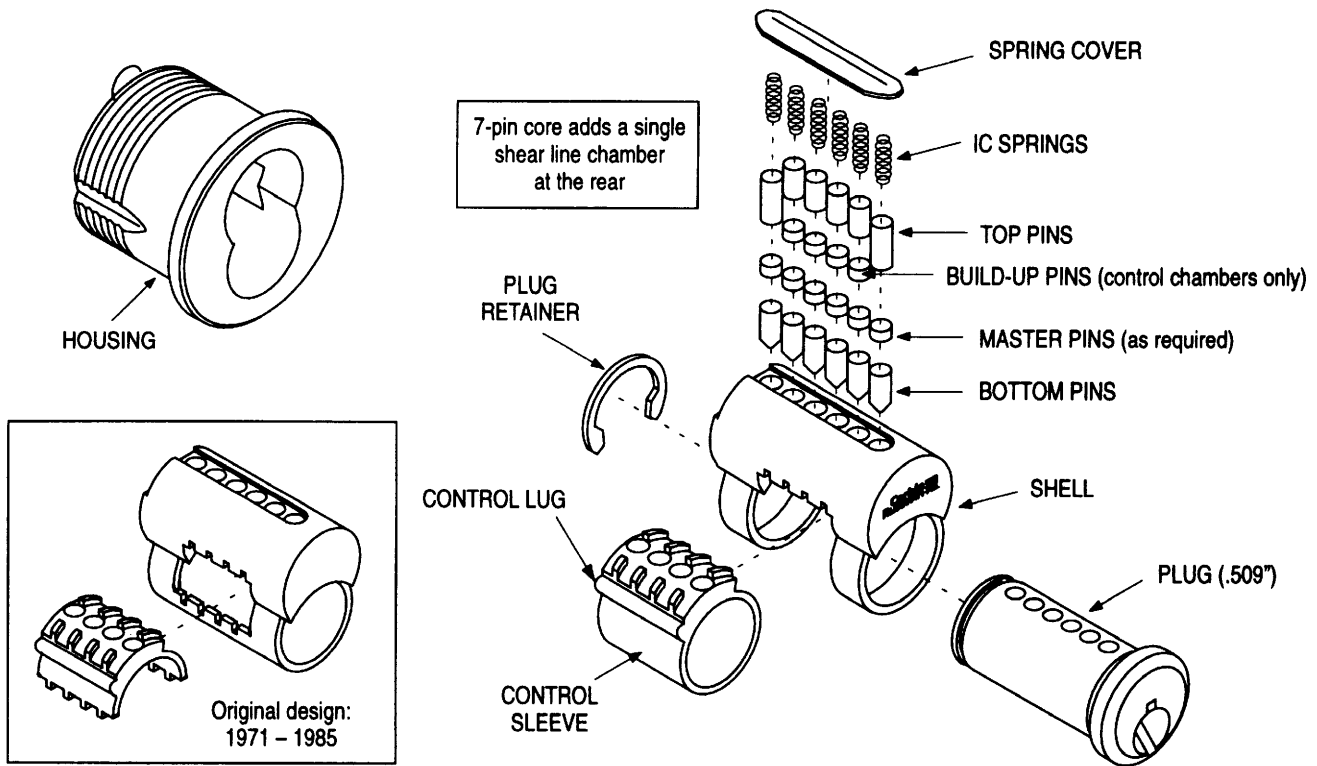
Step 7

Apply a tiny amount of powdered graphite to each chamber over the pins and carefully slide the loaded plug back into the shell, pushing the follower out as you go. Be sure the plug is turned about 45°! Otherwise the top pins and springs will shoot into the plug, locking it part way into the shell. If this happens, the spring cover must be removed and the appropriate chambers emptied to correct the problem.

Step 8

Turn the *fully inserted* plug to the 12 o'clock position and allow it to lock. Test each key for smooth operation. *Be careful when removing keys. The plug is still free to come out, losing your work.* Place the tips of your finger and thumb against the plug face and "pinch" the keys out after testing. If all keys operate, install the cam or plug retainer and test any *one* key for smooth plug rotation, to be sure the retainer does not bind.

Combining Interchangeable Core



This core was introduced in 1971 and is available in *all* Corbin Russwin keyways.

Notice from the exploded view that only the four center pin chambers have a separate shear line for the operation of the control key. These will be referred to as the *control chambers* and the others as *non-control chambers* throughout this text. This is an important distinction because the two types of chambers are combined differently.

Top pins in the control chambers vary in length and will be assigned different numbers. However, non-control chambers always use a .247" top pin which will be symbolized by the letter "T" for "top". The tumbler spring is different from that of conventional cylinders. Its number is 172F21-7.

The spring's strength and number of coils are designed to work with the top pins specified by the factory for proper

operation. If you do not use original Corbin Russwin springs, you may need to adjust the length of the top pins accordingly.

Cores may either be serviced by removing the spring cover and top loading or by removing the plug and using a follower. The latter method is covered earlier under the servicing of conventional cylinders.

Control Key for 0-Bitted Cores

See Appendix A for bitting specs and use System 70 depths where available.

Control = 113311

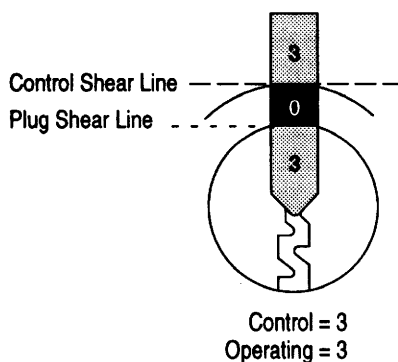
Combining Interchangeable Core

Control Chamber Mechanics

Combining your first interchangeable core is more difficult if you don't understand the mechanics of the core.

Corbin Russwin cores use plus (+), minus (-) and zero (0) build-up pins. This may seem unusual if you are used to combining other brands of interchangeable cores, but it actually makes the pin stacks much easier to determine. There is less math (fewer steps) and after some practice, it is much easier to do in your head without writing anything down.

In a control chamber there are two shear lines. All operating keys operate down at the plug. Only the control key operates at the higher shear line. To simplify our first examples, we won't do any master keying. There will be just one operating key and one control key.



In the first example, we have an operating key with a #3 cut. Obviously, that requires a #3 bottom pin.

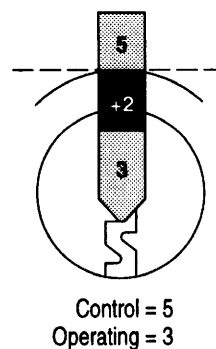
The control key is also a #3. When the control key is inserted, the bottom pin is at the plug shear line because the operating key is also a #3.

We need something called a *build-up pin* to add enough material into the chamber to allow a shear line up where the control key operates.

Since both keys have #3 cuts, we need the build-up pin to be exactly long enough to span the distance from the plug shear line to the control shear line. No longer; no shorter.

The pin which spans exactly that distance (.163") is called a size "zero" pin because it is used when there is zero difference between the control key cut and the total loaded into the plug. In this case, the control key is 3 and there is a 3 bottom pin in the plug. $3 - 3 = 0$.

The top pin is always the same as the control key itself, 3. No additional adding or subtracting is necessary to determine the top pin.

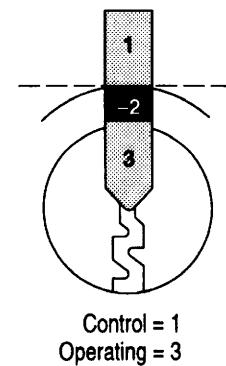


In the second example the operating key is still a #3 cut but we've made the control key deeper: #5.

When the control key is inserted, the #3 bottom pin falls below the plug shear line but the top end of the build-up pin still must reach up to the control shear line. To do this, the build-up pin must be longer than zero.

When the pin is longer than zero, it gets a plus (+) sign. In this case, it is longer by two increments. $\text{Control} - \text{plug total} = \text{build-up pin}$. $5 - 3 = (\text{positive}) + 2$.

Again, the top pin is easy because it's the same as the control cut: 5.



The last example shows what happens when the control key is shallower than the plug total.

We still have a #3 bottom pin for the operating key but we changed our control key to a #1 depth. When the shallower control key is inserted, it pushes the #3 bottom pin up past the plug shear line.

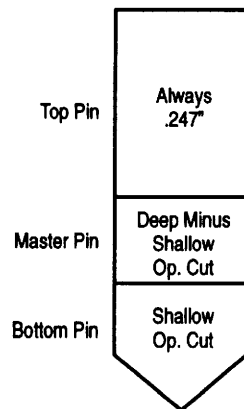
Since the top end of the build-up pin must stop at the control shear line, we need a build-up pin which is shorter than zero, in this case by two increments. It is a -2 size.

Confirming this with the formula, $\text{control minus plug total} = \text{build-up pin}$. $1 - 3 = (\text{negative}) - 2$.

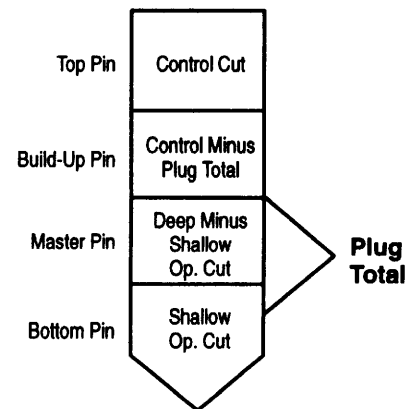
As always, the top pin is the same size as the control cut: 1.

Combinating Interchangeable Core

Non-Control Chamber Pin Stack Spring 172F21-7



Control Chamber Pin Stack Spring 172F21-7



We can now proceed to master keyed cores. Reviewing the exploded view shown earlier, remember that the front and back pin chambers are *non*-control chambers. There is no build-up pin and the top pin is always a .247" without a numerical size. All the examples on the previous page were control chambers.

The bottom pin and master pin are determined the same way for every pin tumbler cylinder in the world: The bottom pin matches the shallower

operating key cut and the master pin is the difference between the deeper and shallower cut.

Beware of 0!

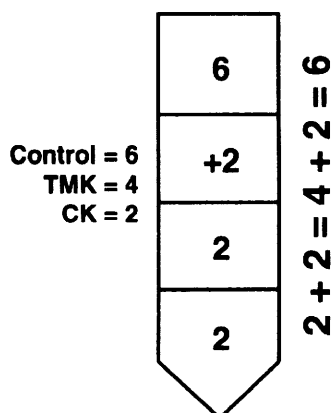
When determining a Pre-System 70 pin stack, beware that Corbin differs from Russwin in its use of the numeral "0" in a key combination and bottom pin length. In Russwin, it is the shallowest cut and shortest pin: *zero*. In Corbin, it is the deepest cut and longest pin: *ten*. For build-up pins, however, it's *always zero*.

When determining the build-up pins for control key operation we need to introduce a new term: *plug total*. When you add the bottom pin to any master pin(s) you get the plug total; the total number of "units of stuff" in the plug.

To review, Corbin Russwin build-up pins are determined by subtracting the plug total from the control cut. The top pin size is the same number as the control cut. See below.

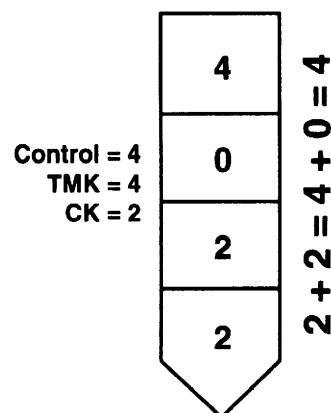
Example 1: When the control cut is deeper than the deepest operating cut, a "plus" build-up pin results: Control = 6, change key = 2 and top master key (TMK) = 4. The plug total is 4 (master pin + bottom pin). The build-up pin is +2 (control - plug total = build-up pin).

Control Cut Deeper Than Plug Total



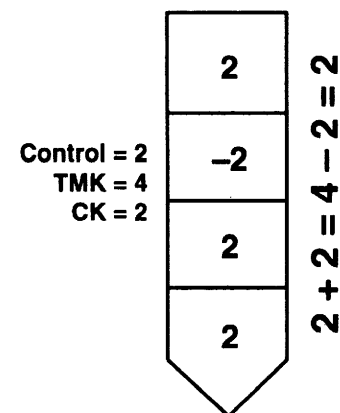
Example 2: There is a 0 build-up pin. When the control cut is the same as the plug total, the difference is zero, so a 0 build-up pin is required. (Control - plug total = build-up pin.)

Control Cut Equals Plug Total



Example 3: When the control cut is shallower than the deepest operating cut, a "minus" build-up pin results. (Control - plug total = build-up pin.)

Control Cut Shallower Than Plug Total



As you pin a chamber from the bottom up, notice that all pins add and/or subtract together to equal the control key biting at the top. You will build up considerable pinning speed if you pin every chamber by thinking of the math from the bottom up.

Unit 3 — Cylinder Construction and Combinating

Combinating Interchangeable Core

Have the bittings (key combinations) written out for all keys which are to operate the core you are combinating. These may come from the bitting list, from numbers stamped on the key bows or from measuring with a key gauge or calipers. Cylinders should be combinated by these numbers, rather than by trial and error. Never file pins or plugs in any type of cylinder.

Name of Key	Symbol	Symbol
Control Key	CTR	1 2 3 6 3 4 (Middle 4 have their own shear line.)
Great Grand Master Key	GGM	1 2 3 4 6 4
Grand Master Key	A	3 2 3 4 6 4
Master Key	AJ	3 4 5 4 6 4
Change Key	AJ3	3 4 5 2 2 2

Normally, if you combine a cylinder to the control key, TMK and change key, all other keys will operate automatically. This is because all intermediate level master keys are made up entirely of cuts from the TMK or change key.

In the example above, notice that each cut of A and AJ is found either in AJ3 or GGM. Your job is now simplified because you only need to look at two key bittings when determining the bottom pin and master pin: those of AJ3 and GGM.

Remember that the control key operates at its own shear line only in the middle chambers. We use build-up pins to allow the control key to reach that shear line in those positions. We disregard the control key bittings in the non-control chambers because they are the same as the TMK. We are left with these bittings to consider when combinating the core.

Control Key	CTR	2 3 6 3
Great Grand Master Key	GGM	1 2 3 4 6 4
Change Key	AJ3	3 4 5 2 2 2

Some keying systems use selective master keys such as ENG (engineer's key), MAIN (maintenance key), JAN (janitor's key) etc. which will have one cut different from the TMK. If that key is also to operate, then its (one) special cut must be added to the numbers you write down.

In very rare cases, one of the intermediate master keys will indeed have a cut not contained in the TMK or change key. If you find this to be the case, that unique cut must also be considered. However, beware that, unless this rare case is taken from a factory generated bitting list, chances are that it is an error in your keying system and will result in key interchange!

Once you have determined all bittings, you are ready to proceed with the mechanics of cylinder combinating. The recommended method of servicing interchangeable cores is by top loading, rather than by using a plug follower.

Step 1

Determine whether your key bittings are bow to tip (all System 70 and Russwin) or tip to bow (Corbin Pre-System 70 only). This determines from which end the pins will be loaded into the plug. We will assume a System 70 example, bow to tip.

Step 2

Remembering that there are control chambers and non-control chambers, select the pin numbers based on whether you're combinating a control chamber or not.

The process is described on the next page.

Combining Interchangeable Core

Step 3a

Combine the complete core by the numbers. If you are using a pin kit arranged by pin numbers, load the pins into the chambers, remembering whether you are working *bow to tip* or *tip to bow*. If you only have a 5-pin system, leave the 6th chamber empty. If you have 7-pin cores, the 7th chamber is a non-control chamber, so it is combined with the same logic as chambers 1 and 6.

Control	1	2	3	6	3	4
TMK	1	2	3	4	6	4
Change Key	3	4	5	2	2	2

Top Pin	T	2	3	6	3	T
Build-Up Pin		-2	-2	+2	-3	
Master Pin	2	2	2	2	4	2
Bottom Pin	1	2	3	2	2	2

Step 3b

If you are using a pin kit with actual lengths in thousandths of an inch, you must convert these numbers to thousandths. Refer to the one page of Appendix A that applies to your particular keying system. For our example we will assume our keying system is Z Class System 70. The plug diameter of the core is .509". Referring to Appendix A we can determine the actual lengths of pins to load.

Top Pin	T .247"	2 .163"	3 .135"	6 .080"	3 .135"	T .247"
Build-Up Pin		-2 .107"	-2 .107"	+2 .218"	-3 .080"	
Master Pin	2 .056"	2 .056"	2 .056"	2 .056"	4 .112"	2 .056"
Bottom Pin	1 .160"	2 .189"	3 .217"	2 .189"	2 .189"	2 .189"

Step 4

Apply a *tiny* amount of powdered graphite to each chamber over the pins.

Step 5

Hold the springs down and test all keys.

Step 6

Stake the spring cover on.

Key Bitting Array

Control	6 3					
TMK	1	2	3	4	6	4
	2	3	4	5	1	5
	3	4	5	1	2	6
	4	5	6	2	4	1
	5	6	1	3	5	2
	6	1	2	3		

Master Keying Rules

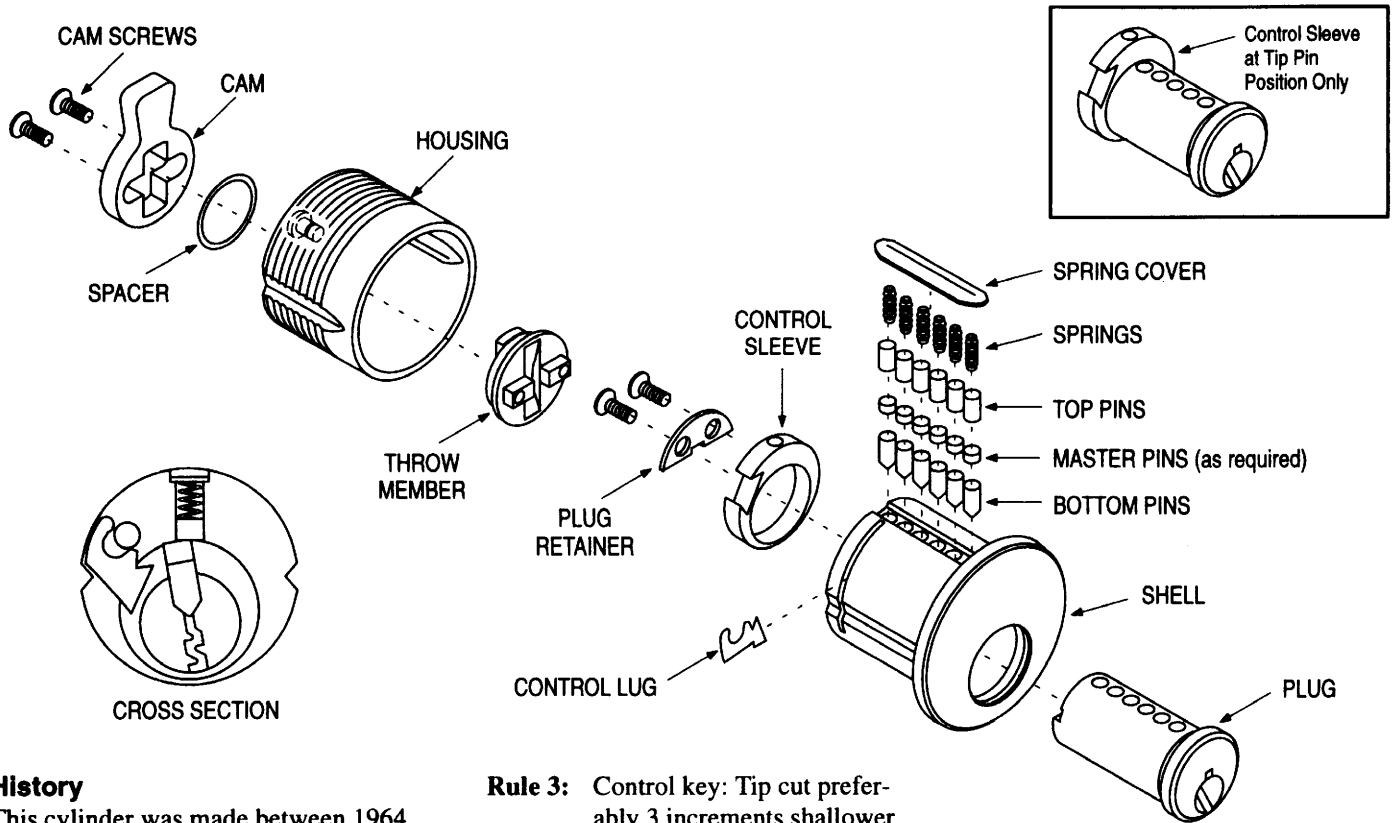
If the IC keying system was set up by the factory, certain relationships will exist between the control key and the top master key (TMK.)

- Rule 1:** The control bitting must be identical to the TMK bitting except for two positions.
- Rule 2:** The two positions which are different must fall within the range of positions 2 through 4, because those are the control chambers.
- Rule 3:** If high security cylinders are integrated, the two differing positions must be chambers 2 and 3, because those are the only control chambers in the high security core. Page 32 is devoted to high security IC.
- Rule 4:** The two bittings which make the control key different must not be used in the progression of the system. Otherwise, the control key will align at the operating shear line as well as the control shear line and it will jam.
- Rule 5:** In System 70, do not use a #1 cut in the control positions of the control key. No build-up pin is available to allow a #6 cut to operate under it.

The factory occasionally deviates from these rules to accommodate special situations. However, if you are servicing a system where any of these rules are broken, faulty combinations have probably been added into it.

Unit 3 — Cylinder Construction and Combining

Old Round Interchangeable Core



History

This cylinder was made between 1964 and 1971. The line consisted of 5 and 6-pin rim and mortise cylinders. Cores were interchangeable between them, provided the number of pins was the same.

Combining a Core

The plug diameter is .509", regardless of the key class. Use the same build-up and top pins in the control chamber of this core as you use in the control chambers of the modern figure-8 core. All other chambers use a standard .171" top pin.

Master Keying Rules

If you must rekey a system of these cylinders, there are special rules to follow. This system pre-dates System 70, so all rules and examples are given in the old 10 depth system.

Rule 1: Select the TMK and control bittings to be identical in all **but** the control position at the tip.

Rule 2: TMK: The deepest cut possible at the tip of the key is preferred.

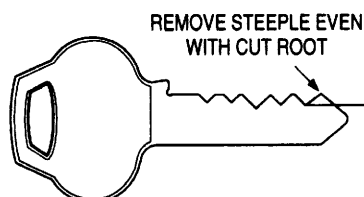
Rule 3: Control key: Tip cut preferably 3 increments shallower than TMK:

Russwin D, H and N	CTR	xxxxx6
	TMK	xxxxx9
Russwin 981 Class	CTR	xxxxx5
	TMK	xxxxx8
Corbin (Tip to bowl)	CTR	7xxxxx
	TMK	0xxxxx

Rule 4: Change key: Tip cuts **minimum** 2 steps away from the control cut.

Rule 5: Don't use either of the last two chambers for construction master keying.

Rule 6: Remove the steeple after any cut in the last position which is deeper than the control key. This prevents operating keys from removing the core.



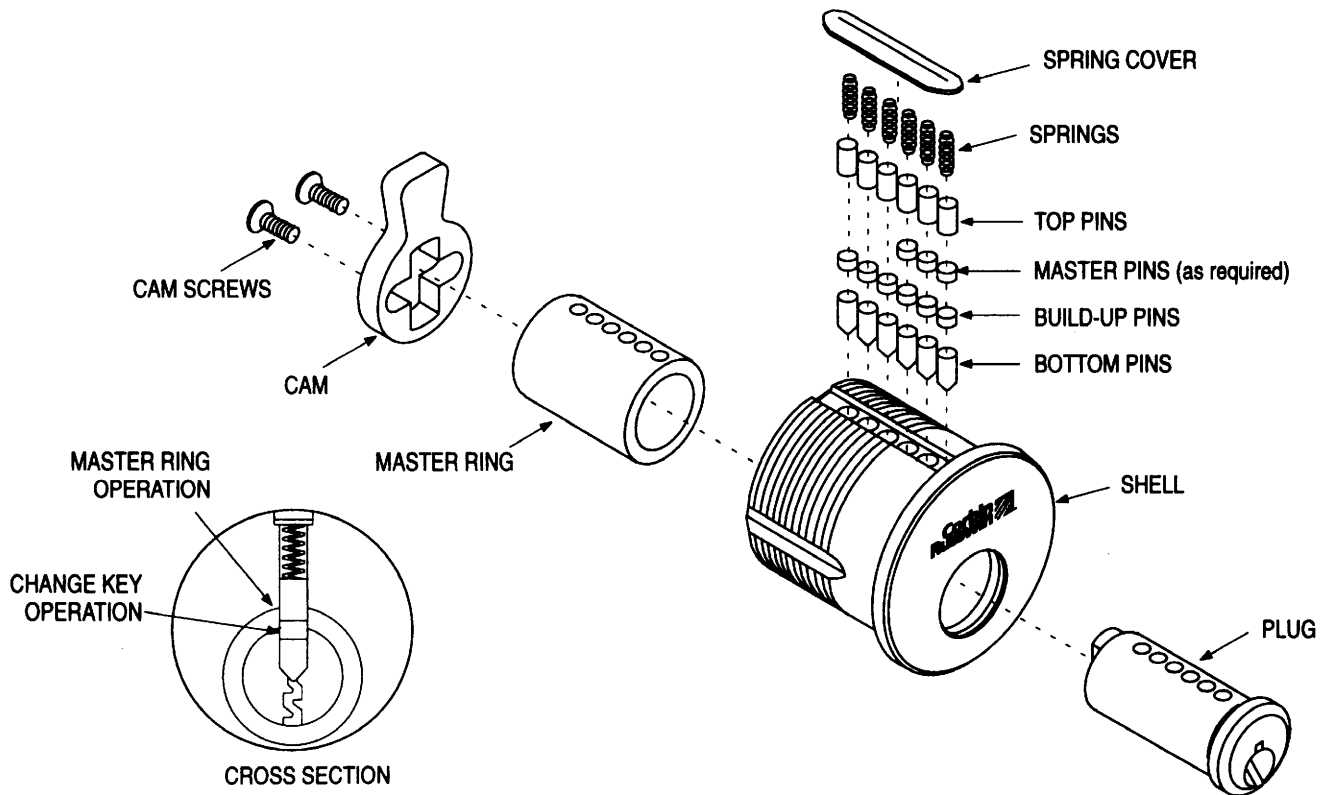
Limitations

When setting up a keying system for these cylinders, the key biting array (KBA) only has three progression possibilities in the control chamber.

There are only three possible paradigms for each of the three key classes used with these cylinders:

	Corbin	981	D, H, N	
①	Control	7	5	6
	TMK	0	8	9
	Progression Possibilities	1	B	0
		3	1	2
②	Control	3	1	2
	TMK	0	8	9
	Progression Possibilities	1	B	0
		6	4	5
③	Control	5	3	4
	TMK	0	8	9
	Progression Possibilities	1	B	0
		3	1	2

Master Ring



History

The master ring cylinder was patented (#414,720) by Edward O'Keefe, a New York City locksmith, on November 12, 1889. He assigned the patent to P & F Corbin where it became a milestone in the development of master keying.

Operation

Every chamber of the master ring cylinder has two shear lines. Normally, the plug shear line is used exclusively for change key operation and the ring shear line is for master keys of all levels.

Keying Capacity

In conventional cylinders, a strict relationship exists between the cuts of master keys and their change keys. Since the change keys and master keys have separate shear lines in a master ring cylinder, the relationship between them has few constraints.

This freedom results in keying capacity roughly equivalent to adding another pin chamber to a single shear line cylinder. The *theoretical* number of change keys offered by a 6-pin master ring cylinder is similar to that of a 7-pin conventional cylinder.

When System 70 depths were implemented in 1970, it allowed more *theoretical* change keys. Therefore, fewer and fewer new master ring keying systems have been developed since 1970. Master ring advantages were overlooked in this transition, however.

Advantages

Certain factors severely reduce the number of actual change and master keys in a split pin keying system, while master ring systems are much less limited by them:

- number of levels of keying
- construction master keying
- selective master keys

In other words, keying systems with these requirements often have a far greater number of change keys available in master ring, even when compared to System 70 in single shear line cylinders.

Limitations

Not all modern Corbin Russwin hardware supports the larger diameter master ring cylinders, so new master ring keying systems must drive the type of hardware used.

Single shear line cylinders can be integrated into a master ring system, but the areas of their use within the structure of a keying system must be known at the inception of a system.

It is seldom possible to integrate single shear line cylinders into a master ring system after the fact. Doing so normally creates key interchange and/or places limitations on system expansion.

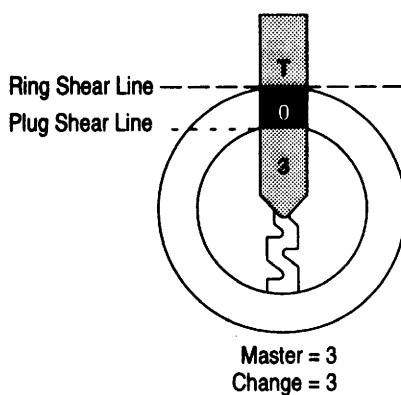
Combining Master Ring

Master Ring Mechanics

Master ring cylinders are combined similar to the control chambers of Corbin Russwin interchangeable cores. They require build-up pins with plus (+) and minus (-) values. This may seem unusual at first, but the process is very easy.

Unlike conventional cylinders, master ring cylinders do not use master pins in the plug (unless they are cross keyed). The bottom pins match the change key combination. Only the master level keys (MK, GMK, GGMK, etc.) operate at the higher shear line.

We will illustrate simple master keying first. There will be just a change key and one master key.



In the first example, we have a change key with a #3 cut. That requires a #3 bottom pin.

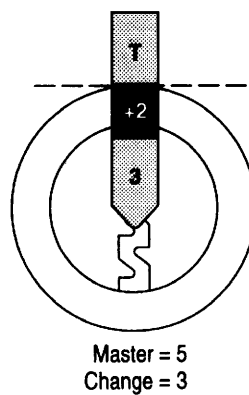
The master key is also a #3. When the master key is inserted, the bottom pin is at the plug shear line because the change key is also a #3.

We need something called a *build-up pin* to add enough material into the chamber to allow a shear line up where the master key operates.

Since both keys have #3 cuts, we need the build-up pin to be exactly long enough to span the distance from the plug shear line to the ring shear line; no longer and no shorter.

The pin which spans exactly that distance is called a size “zero” pin because it is used when there is zero difference between the master key cut and the total loaded into the plug. In this case, the master key is 3 and there is a 3 bottom pin in the plug. Master minus change key = build-up pin: $3 - 3 = 0$.

The top pin does not get a numbered size. It is always .171”.

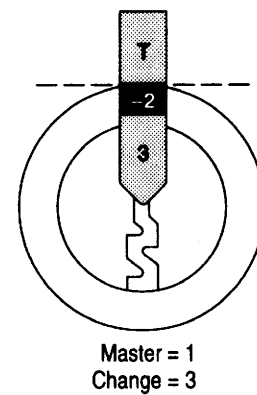


In the second example the change key is still a #3 cut but we’ve made the master key deeper: #5.

When the master key is inserted, the #3 bottom pin falls below the plug shear line but the top end of the build-up pin still must reach up to the ring shear line. To do this, the build-up pin must be longer than zero.

When the pin is longer than zero, it gets a plus (+) sign. In this case, it is longer by two increments. Master – change key = build-up pin.
 $5 - 3 = (\text{positive}) + 2$.

Again, the generic top pin is .171”.



The last example shows what happens when the master key is shallower than the change key.

We still have a #3 bottom pin for the change key but we changed our master key to a #1 depth. When the shallower master key is inserted, it pushes the #3 bottom pin up past the plug shear line.

Since the top end of the build-up pin must stop at the ring shear line, we need a build-up pin which is shorter than zero, in this case by two increments. It is a -2 size.

Confirming this with the formula, master minus change key = build-up pin: $1 - 3 = (\text{negative}) 2$.

As always, the top pin is .171”.

Combining Master Ring

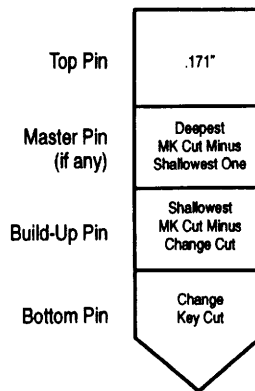
Grand Master Keying

The previous page demonstrated the mechanics of pinning a cylinder to a master and change key. In reality, master ring cylinders are usually also keyed to grand masters and great grand masters. These will require master pins in some chambers. The master pins must be placed up at the ring, however; not in the plug.

When dealing with different levels of master keys, some cuts of the lowest level master key (e.g. master AA) will be identical to those of the top master key (e.g. the great grand master key). No master pins are added in those chambers of the cylinder. Combine them as the examples on the previous page showed.

When the master level keys have cuts which are *different* from each other in any position, that chamber requires a master pin. In such chambers, the build-up pin gets the *shallowest* master key(s) to operate up at the ring shear line. The master pin is added to allow the *deepest* master key(s) to operate as well.

This illustration how each pin is determined within a pin stack.



To determine the build-up pin, subtract the change key cut (bottom pin) from the shallowest master cut. The master pin size is the difference (if any) between the deep and shallow master key cuts. The top pin size is a uniform .171" in master ring cylinders.

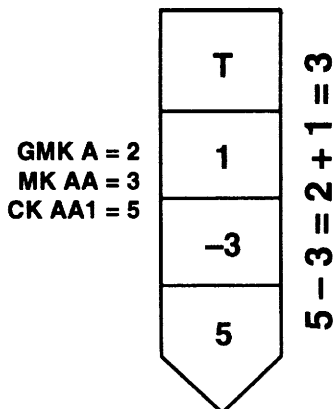
Beware of 0!

When determining a Pre-System 70 pin stack, Corbin differs from Russwin in its use of the numeral "0" in a key combination. In Russwin, it is the shallowest cut: *zero*. In Corbin, it is the deepest cut: *ten*.

A size "0" build-up pin always represents *zero*. Its length matches the thickness of the master ring (.142" or .163", depending on the plug diameter.) This can be confusing with Corbin where 0 represents a *ten* for keys and bottom pins, but a *zero* for build-up pins.

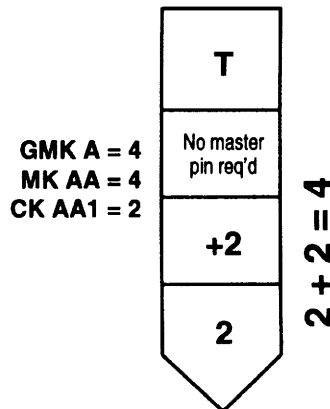
Example 1: When the shallowest master key cut is *shallower* than the change key cut, a "minus" build-up pin results: A = 2, AA = 3 and AA1 = 5. The build-up pin is -3 (GMK minus CK).

Shallower MK is Shallower than CK



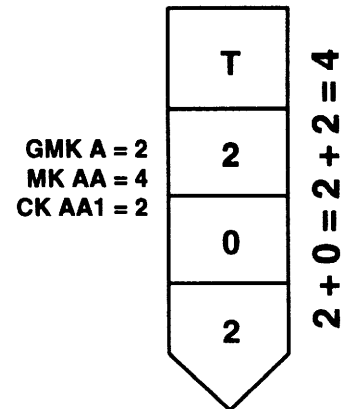
Example 2: When the shallowest master key is *deeper* than the change key, the difference is positive, so a +2 build-up pin is required. Both master keys are the same depth in this example, so no master pin is used.

Shallower MK is Deeper than CK



Example 3: When the shallowest MK cut is the same as the change key cut, a "zero" build-up pin results.

Shallower MK is Same as CK



Unit 3 — Cylinder Construction and Combining

Combining Master Ring

The previous examples illustrate individual pin chambers. It is time to combine a complete 6-pin cylinder.

When we pin conventional cylinders to the top master key (TMK) and the change key, all intermediate level masters usually operate automatically. This is not the case with master ring cylinders. Therefore, *all* key combinations should be written down before combining a cylinder.

It is highly recommended to draw a horizontal line to visually separate the combination(s) which operate at the plug from those that operate at the ring. This reduces errors.

Since most master ring systems are Pre-System 70, we will not use System 70 for the examples.

Critical Differences Between Corbin and Russwin

Corbin logic only differs from Russwin logic in Pre-System 70, the 10 depth system.

The examples illustrate the difference between Corbin and Russwin when 0 is a digit of a key bitting. Remember, this is the deepest cut in Corbin and the shallowest cut in Russwin.

Also, in Pre-System 70, Corbin is always *tip to bow* while Russwin is *bow to tip*. This becomes critical when loading pins into the cylinder!

The last step is the translation of the pin numbers into the individual sizes in thousandths of an inch.

We will use the Corbin example and specify 57A1 (X Class) keyway. Referring to Appendix A, you will find all the pin lengths for both plug diameters. We will say that our example is a .552" plug cylinder.

Corbin Pre-System 70 Example (0 = Ten)

GGM	3	8	0	9	0	2
A	5	8	0	9	0	2
AA	5	0	4	9	0	2
<hr/>						
AA1	5	0	4	3	2	8
Top Pin	T	T	T	T	T	T
Master Pin	2	2	6	No master pins required here.		
Build-up Pin	-2	-2	0	+6	+8	-6
Bottom Pin	5	0	4	3	2	8

Russwin Pre-System 70 Example (0 = Zero)

GGM	3	8	0	9	0	2
A	5	8	0	9	0	2
AA	5	0	4	9	0	2
<hr/>						
AA1	5	0	4	3	2	8
Top Pin	T	T	T	T	T	T
Master Pin	2	8	4	No master pins required here.		
Build-up Pin	-2	0	-4	+6	-2	-6
Bottom Pin	5	0	4	3	2	8

Corbin 57A1 Keyway .552" Plug

Top Pin	T .171"	T .171"	T .171"	T .171"	T .171"	T .171"
Master Pin	2 .028"	2 .028"	6 .084"	No master pins required here.		
Build-Up Pin	-2 .056"	-2 .056"	0 .163"	+6 .247"	+8 .275"	-6 .080"
Bottom Pin	5 .228"	0 .297"	4 .213"	3 .198"	2 .186"	8 .269"

Master Ring Master Keying Rules

Progression of bittings in a master ring system is done with totally different logic than that used for single shear line cylinders.

The reader is therefore strongly cautioned against applying the following information to non-master ring cylinders. However, the more flexible master ring cylinder can use all combinations generated with traditional split-pin progression.

The information about to be presented is an advanced topic and assumes a firm knowledge of the science of conventional master keying on the part of the reader.

A Barrel Full of Change Keys

This is the “big picture” of master ring system theory. Create a handful of master level keys using traditional progression. Then, generate thousands of change key combinations in order, but use what *appears* to be every possibility in every chamber.

Store the change keys in a barrel and pull them out at random, whenever you need them, for use under *any* of the master keys!

This is only a slight oversimplification. A 100% master ring system indeed offers this flexibility!

The Key Bitting Array

All master keying progression begins with some sort of KBA (See Unit 1) and master ring is no exception. Since there are two separate shear lines, however, the master ring KBA has two parts.

The top part is for master key progression at the ring. The bottom is for change key progression at the plug. The only constraint is that the two parts must be mutually exclusive in order to prevent key interchange. That exclusion can be as simple as one bitting in one position.

All our examples will use Pre-System 70. This is a two step progression system with ten depths.

Two different methods have been used by the factory to generate the two-part KBAs. One maintains parity while the other does not.

Method 1

We will begin with the KBA which maintains parity, since its logic will be more familiar.

Key Bitting Array No. 1

	TMK	7	8	5	9	8	6
Master Keys Only	7	0	7	1	0	8	
		2	9	3	2	0	
		4	1	5	4	2	
		6	3	7	6	4	
Change Keys Only	9	0	7	1	0	8	
		1	2	9	3	2	0
		3	4	1	5	4	2
		5	6	3	7	6	4
		8	5	9	8	6	

The top of the KBA is for master level keys pinned to the ring shear line. Notice the constant 7 in the first column. Total position progression gives $4 \times 4 \times 4 \times 4 \times 4 = 1,024$ theoretical lower level master keys under the TMK available from the other five columns of progression. These keys are made to operate by using master pins at the ring shear line. Therefore, the rotating constant method should be applied to those columns to increase security.

The bottom of the KBA is for change keys pinned to the ring shear line. Notice the absence of the 7 in the first column. This is what prevents all masters from the top progression from operating down at the plug, and all CK's from the bottom progression from operating up at the ring, *even though all other bittings of the TMK are contained in the bottom array!* All it takes is one cut to prevent operation.

Total position progression gives $4 \times 5 \times 5 \times 5 \times 5 \times 5 = 12,100$ theoretical change keys — the barrel full. Compare that with the 4,096 theoretical change keys available in a single shear line cylinder.

Since they are not associated with any master keys, *each master ring change can be used under any of the 1,024 master level keys!*

The only losses are MACS violations and the casualties of cross keying. Uncontrolled cross keying at the change key level is easy. Selective master keys are easy. All traditional limitations of split pin master keying become insignificant in a master ring system.

Now that we have demonstrated how bittings that would destroy a split pin master key system can be used together safely in master ring cylinders, we can introduce the factory's second method of progression.

Unit 3 — Cylinder Construction and Combining

Master Ring Master Keying Rules

Method 2

This method of progression involves a periodic change of parity in all but one column of the change key biting array. This, too, is unheard of in split pin master keying, but totally safe in 100% master ring systems. This method should be avoided in areas of the system where single shear line cylinders are included.

In order to present this type of progression, we will demonstrate by example. Therefore, we will need to add the *sequence of progression* to our KBA. This is the order in which the columns are progressed. We will use letters in the *SOP*. Column A changes first, Column B next, etc.

Key Biting Array No. 2

	TMK	7	8	5	9	8	6
Master Keys Only		7	0	7	1	0	8
		2	9	3	2	0	
		4	1	5	4	2	
		6	3	7	6	4	
Change Keys Only		9	1	0	0	1	1
		1	3	2	2	3	3
		3	5	4	4	5	5
		5	7	6	6	7	7
		9	8	8	9	9	
		0	1	1	0	0	
		2	3	3	2	2	
		4	5	5	4	4	
	6	7	7	6	6		
	8	9	9	8	8		
Sequence of Progression:		F	E	D	C	B	A

The master key (top) portion is identical to that of KBA No. 1. The change key (bottom) portion itself now has two parts.

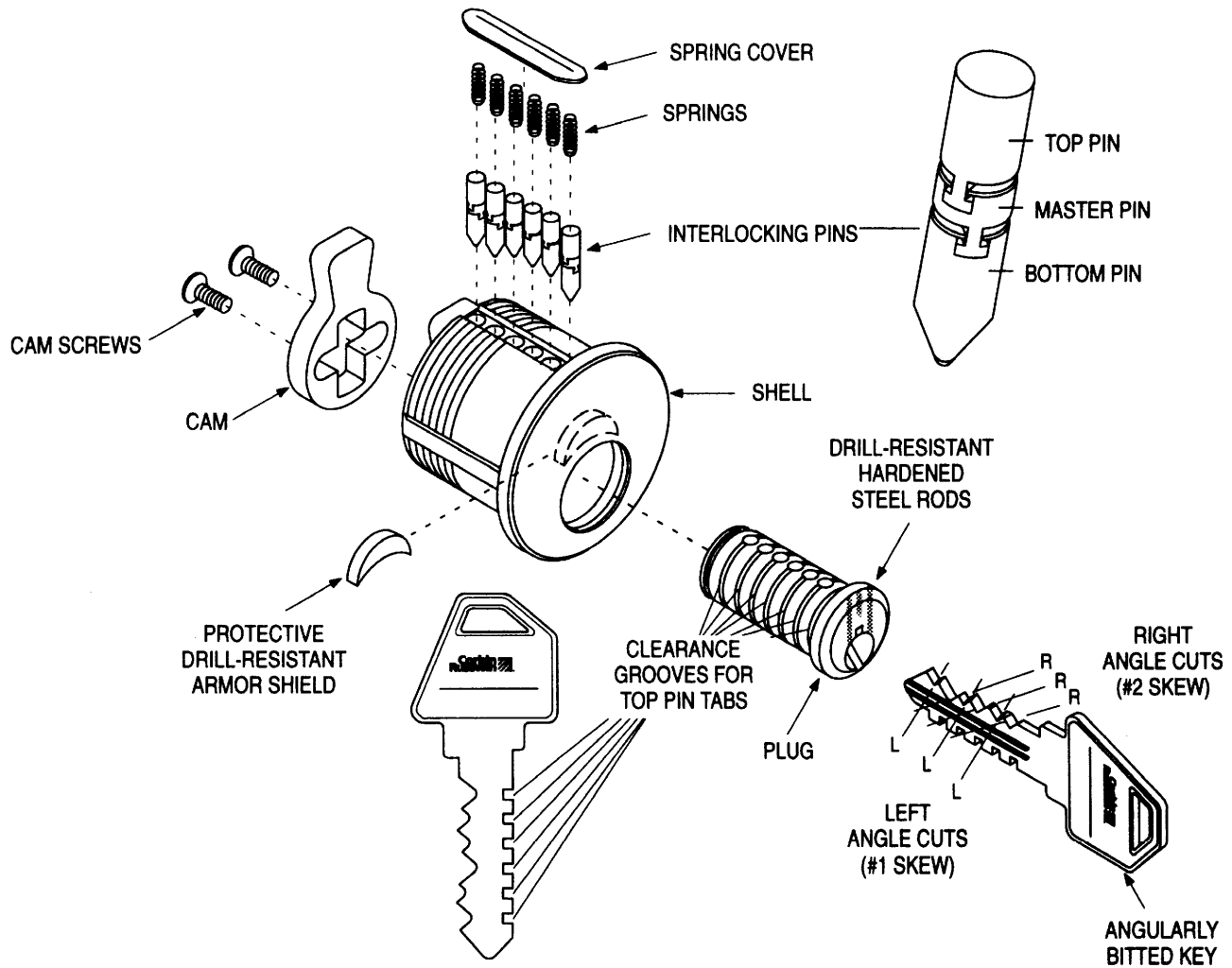
Rule: Each time a new column changes, change the parity of all previously progressed columns simultaneously.

This will give the illusion that key interchange will eventually occur from keys being only one increment away from each other in what should be a two step system. However, notice that the last progressed column (F) of the KBA never gets that close. It only takes one cut to *prevent* interchange, even if all other cuts appear suspicious!

It is more difficult to explain this progression than it is to do it. The easiest way to learn is by observing. Here is the first section:

910011	910200	910411	910600	910811	912100	912311	912500	912711	912900
3	2	3	2	3	2	3	2	3	2
5	4	5	4	5	4	5	4	5	4
7	6	7	6	7	6	7	6	7	6
9	8	9	8	9	8	9	8	9	8
30	21	30	21	30	21	30	21	30	21
2	3	2	3	2	3	2	3	2	3
4	5	4	5	4	5	4	5	4	5
6	7	6	7	6	7	6	7	6	7
8	9	8	9	8	9	8	9	8	9
51	40	51	40	51	40	51	40	51	40
3	2	3	2	3	2	3	2	3	2
5	4	5	4	5	4	5	4	5	4
7	6	7	6	7	6	7	6	7	6
9	8	9	8	9	8	9	8	9	8
70	61	70	61	70	61	70	61	70	61
2	3	2	3	2	3	2	3	2	3
4	5	4	5	4	5	4	5	4	5
6	7	6	7	6	7	6	7	6	7
8	9	8	9	8	9	8	9	8	9
91	80	91	80	91	80	91	80	91	80
3	2	3	2	3	2	3	2	3	2
5	4	5	4	5	4	5	4	5	4
7	6	7	6	7	6	7	6	7	6
9	8	9	8	9	8	9	8	9	8

High Security



This cylinder was invented by Walter Surko and patented (#4,103,526) in 1978. It was originally marketed with the Emhart brand name. This was the very first high security cylinder to offer an economical choice for a keying system. That is, it was the first high security mechanism which could be integrated with conventional cylinders in the same master key system.

All Corbin Russwin high security cylinders are 6-pin. In addition to drill resistance and a high level of pick resistance, they offer a higher degree of key control by requiring special machinery to cut the keys. Interchangeable core and special function cylinders add to the high security cylinder offering. These are covered in other sections of this manual.

Keyways

The cylinder is available with System 70 depths in the most modern (Z and DH Class) keyways:

- 59 Series
- 60
- 70
- Restricted and patented keyways
- D Series
- H Series
- L Series

Bitting Angles

The angles, often called skews, are 20° from the perpendicular. There is no CENTER (perpendicular) cut. To read the angles of a key, hold the bow with the blade pointing away from you. Imagine a line going through each cut, as shown above. Then turn that line into an imaginary arrow pointing toward you. The arrow will either point toward you on the LEFT or the RIGHT.

The angles, often called skews, are 20° from the perpendicular. There is no CENTER (perpendicular) cut. To read the angles of a key, hold the bow with the blade pointing away from you. Imagine a line going through each cut, as shown above. Then turn that line into an imaginary arrow pointing toward you. The arrow will either point toward you on the LEFT or the RIGHT.

L and R are the most logical designations for the angles. In practice, however, the factory uses the numerical designations 1 for LEFT and 2 for RIGHT. The bitting is written bow to tip and includes cut depth and angle. Depending on your preference for letters or numbers, a key with cuts 245633 and angles LRLRLR could be written 3 different ways:

2L 4R 5L 6R 3L 3R
 2₁4₂5₁6₂3₁3₂
 2(1)4(2)5(1)6(2)3(1)3(2)

The numerical notation as a subscript appears on most handwritten bitting lists while the parenthetical version is prevalent on computer generated bitting lists. L and R are easier to learn and teach with, so that is what will be used in this manual. It is also the way the PK-70-HS pin kit is labeled.

Unit 3 — Cylinder Construction and Combinating

Combinating High Security

Bitting Depths

Since high security cylinders use System 70 depths exclusively, you would expect 6 possible depths on the keys. However, System 70's shallow 1 cut removes almost no material from the key blade. Therefore, a chisel pointed bottom pin would not have enough of a seat in the cut root for positive rotation. For this reason, high security cylinders use *only depths 2 through 6*.

The beginning of Appendix A shows conventional System 70 bitting specs opposite the high security specs. You will find that the high security cuts are .006" deeper than the conventional ones. This is because the conventional pins are more blunt and cannot seat in the V-shaped high security cut roots. They are held at their proper height by the sides of the V cuts of a high security key. This is what allows high security cylinders to be integrated into the same keying system as conventional cylinders.

Key Codes

Each set of high security keys comes with a tag bearing the code number for that particular combination. The code has three digits followed by five letters. Example: 243 BZYXP.

The three digits designate the keyway and the letters designate the cuts and angles. Stock codes were sold for a short time on microfiche but a large number of codes are reserved for keying systems and have never been published.

The code number is required by the factory when ordering cut keys. If the keys are part of a keying system, a letter of authorization is also required. It is best to check with the Key Records Department before placing an order.

Here is a listing of keyway prefixes for high security key codes.

226	59A	306	D41
227	59AB	308	H81
228	59AC	309	H1
229	59AD	310	H2
230	59A1	311	H3
231	59A2	312	H4
232	59B	313	H5
233	59BD	314	H6
234	59B1	315	H7
235	59B2	316	H8
236	59C	317	H12
237	59CD	318	H34
238	59C1	319	H41
239	59C2	320	H56
240	59D	321	H61
241	59D1	322	H78
242	59D2	323	H83
243	60	324	H85
244 - 291	Restricted	325 - 341	Restricted
292	70	551	L2
293	Restricted	556	L1
300	D1	557	L3
301	D2	558	L4
302	D3	559	L12
303	D4	560	L34
304	D12	561	L41
305	D34		

Cutting Keys

Most modern key coding machines are capable of cutting Corbin Russwin high security keys. Consult your code machine manual for the proper cutter. Refer to Appendix A for proper depth and spacing.

Original Corbin Russwin key blanks manufactured since 1986 are made of very hard material to resist breakage. A drop of oil on the cutter (and protective clothing from the splatter!) will ensure longer cutter life.

To order original high security key blanks, use the normal key blank number format of Corbin Russwin and order the 90 bow. The high security version of D1-6PIN-10 is D1-6PIN-90.

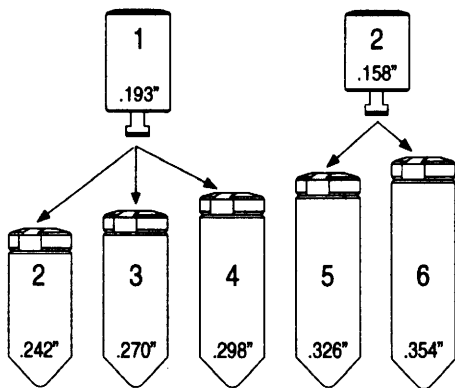
Key blanks may be ordered without formalities for nonrestricted key sections. Restricted blanks require a letter of authorization from the end user.

Unit 3 -- Cylinder Construction and Combining

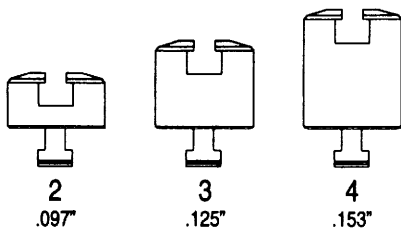
High Security

Pin Lengths

Since there are 5 depths possible on a high security key, there are also 5 lengths of bottom pins. There are only two lengths of top pins. Selection is based on the length of the bottom pin (or bottom pin + master pin) in the chamber, as illustrated.



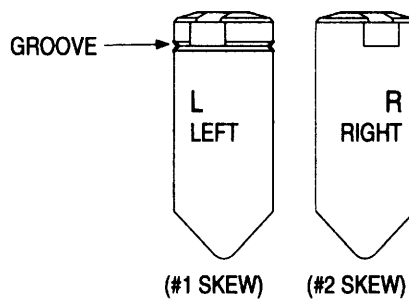
Master pins have three lengths:



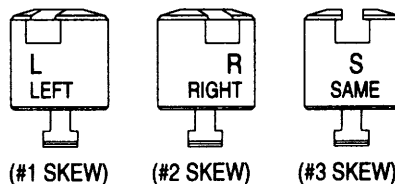
Note: These pin lengths include the projecting "T" of master pins and top pins. Therefore, the overall length of the interlocked pin stack will be considerably less than the sum of these dimensions.

Pin Angles

For ease in recognizing the angle of bottom pins, a groove is cut all the way around the top of all L pins. You can also hold bottom pins so that the chisel point is centered on the bottom and observe which direction the T-groove in the top points. It will either point LEFT or RIGHT.



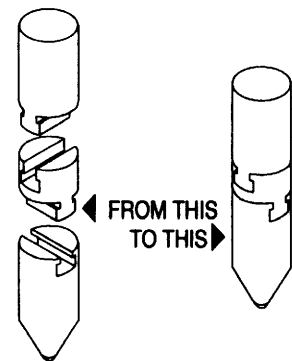
Master pins have three angles:



Reading a master pin's angle is similar to reading a bottom pin's angle, but there is no groove around the L angle pin. Hold the master pin with its interlocking tab centered on the bottom. Observe where the groove across the top points. It will either be Left, Right, or Straight in line with the tab on the bottom.

Handling the Pins

A plug follower cannot be used. The tab of the top pin extends below the shear line and rides in a groove cut around the plug at each pin chamber. All high security cylinders must be top loaded. Select the proper pins from the kit, interlock them in your fingers and drop the entire connected pin stack into its chamber.



Interlock pins, then load chambers.

Special Cylinders

Separate pages of this manual are devoted to these high security cylinder variations:

- High security IC
- Blockout function
- Brink function
- Hotel function

Pin Kit

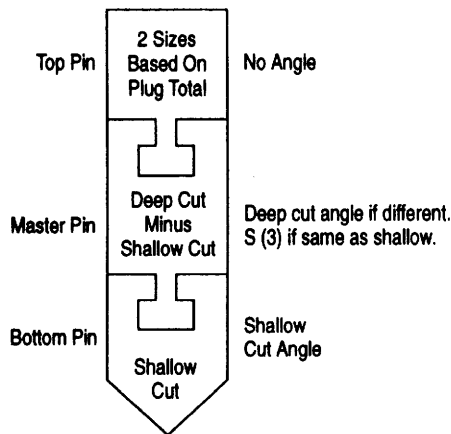
The PK-70-HS kit accommodates all Corbin Russwin high security cylinders, including the special ones just listed.

Combining High Security

Pin Selection

The angle of the bottom pin matches the angle of the key cut. When master keying, the angle of the bottom pin matches that of the *shallower* cut in that chamber.

When the angles of the master key and change key are *different*, the angle of the *deeper cut* determines the angle of the master pin for that chamber (either **L** or **R**.) When the master and change keys have the *same* angle, use an **S**. This angle is called a **3** in the numerical notation. **L** and **R** are 1 and 2, respectively.



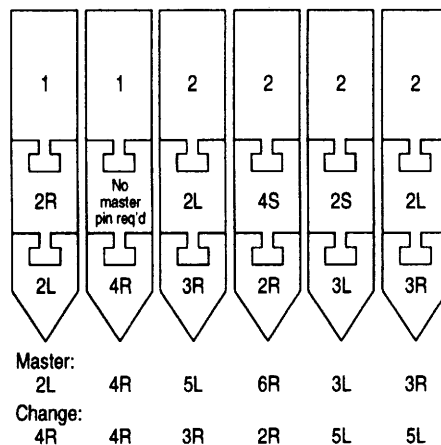
Combining Exercise

We will start with a cylinder which is not master keyed. The key combination is 2L 4R 5L 6R 3L 3R.

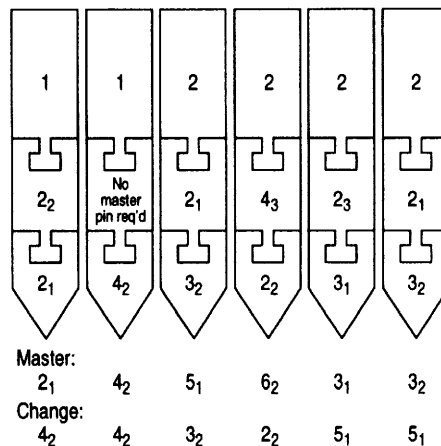
Use bottom pins which exactly match the key cuts, both in length and angle.

As already illustrated, the two sizes of top pins are used as follows: #1 is used when the bottom pin (or bottom + master pin) is 2, 3 or 4. The #2 top pin is used with 5 and 6. The angles are not relevant to top pin selection. The depths 245633 require this set of top pins: 112211.

In a master keyed cylinder you need master pins of the proper length *and angle*. Using our key biting of 2L 4R 5L 6R 3L 3R as a master key, we will invent a compatible change key. The change key biting is 4R 4R 3R 2R 5L 5L. Using the rules under Pin Selection, here is the complete cylinder combination. Note that the second chamber was constant in our example, so no master pin is used.



If you use the numerical designations for the angles, your pinning would be as follows.



Master Keying Rules

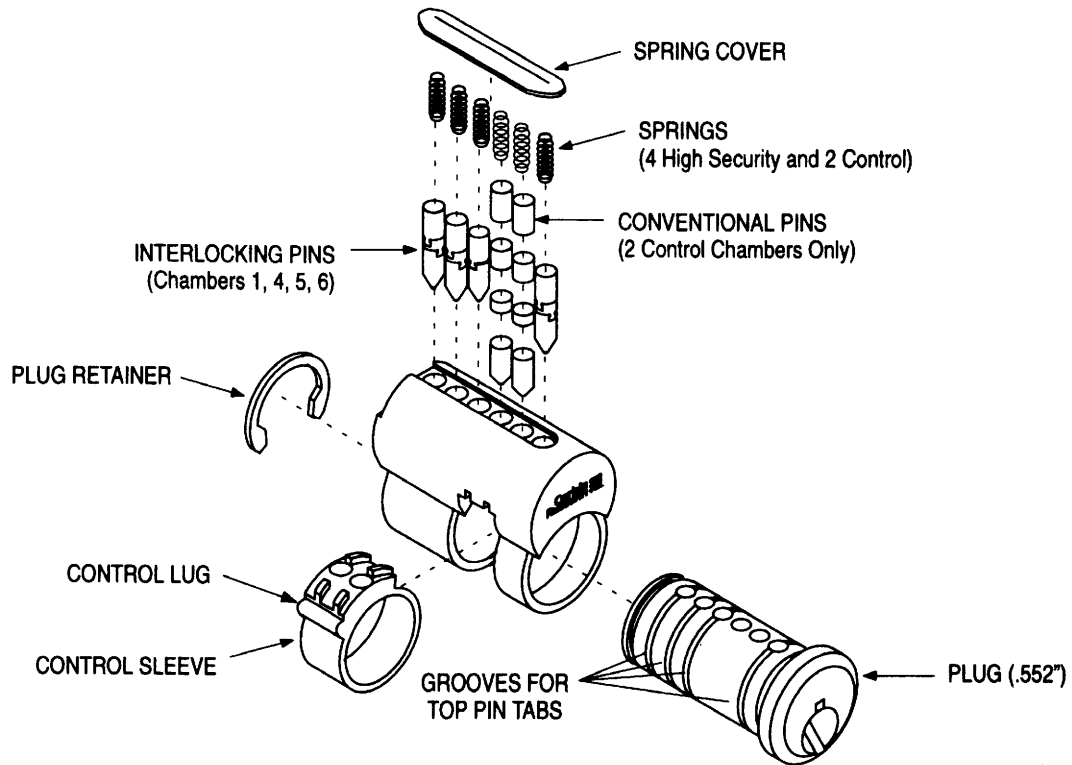
If you are generating your own keying system, keep these rules in mind.

- Rule 1.** There is no #1 depth in high security keys.
- Rule 2.** The MACS is 4 when adjacent cuts have the same angle and 3 when they have opposing angles.
- Rule 3.** There is no #1 master pin. Therefore, all change keys must be at least two steps away from the master key, though they may vary by one step from each other.
- Rule 4.** Angles can be mixed within the same chamber and even the same depth when only high security cylinders are involved.
- Rule 5.** Mixture of high security and conventional cylinders in the same system *must be planned from the inception of the system*. Different angles cannot be of the same depth when that depth is used in a conventional cylinder. Conventional pins cannot differentiate between angles.
- Rule 6.** Item 5 above applies to the second and third chambers of high security interchangeable cores and the last chamber of blackout and Brink function cylinders, since conventional pins are used in those chambers.
- Rule 7.** Special rules apply to the last chamber of Brink and blackout function cylinders. See pages 44 and 45.

Sample Key Biting Array

TMK	2L	4R	5L	6R	3L	3R
	4L	6L	2L	2L	5L	5L
	4R	6R	2R	2R	5R	5R
	5L	2L	3L	3L	6L	6L
	5R	2R	3R	3R	6R	6R
	6L			4L		
	6R			4R		

Combining High Security Interchangeable Core



In the exploded view, notice that four chambers of the core have only one shear line and use high security interlocking pins. The other two chambers are the control chambers. They have two shear lines and use conventional pins.

If you are not familiar with pinning Corbin Russwin high security cylinders or interchangeable cores, previous pages of this manual are devoted to each. These principles must be thoroughly understood before combining the high security IC.

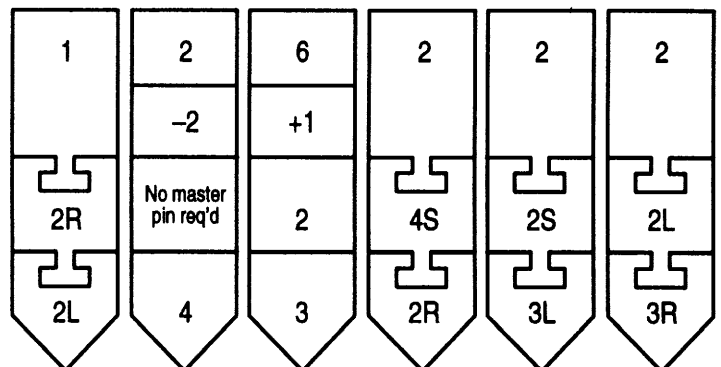
Pinning the high security chambers is done with exactly the same method as described in the previous section of this manual. Pins for the control chambers are determined the same way as they are for conventional cores, but their actual lengths will be different because the high security core has a .552" diameter plug and the conventional core has a .509" diameter plug. The high security page in Appendix A provides all necessary information for pin lengths.

Here is an example set of key bittings and the corresponding core combination. The control key must always be the same as the TMK everywhere but the two control chambers, so disregard those four bittings when combining. They are shown in smaller type.

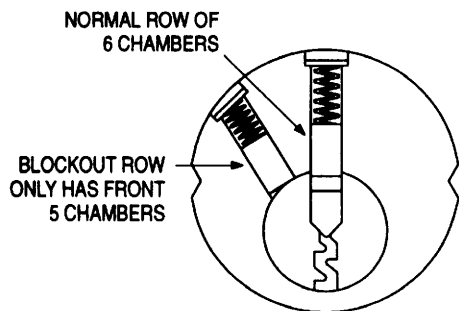
Since conventional pins cannot distinguish between the angles of high security keys, it is usually not possible to integrate IC into a high security keying system which was not originally set up for IC.

Note that both operating keys have 4's in the second position, so no master pin is used.

Control	2L	2R	6L	6R	3L	3R
TMK	2L	4R	5L	6R	3L	3R
Change Key	4R	4R	3R	2R	5L	5L



Blockout Function Cylinders

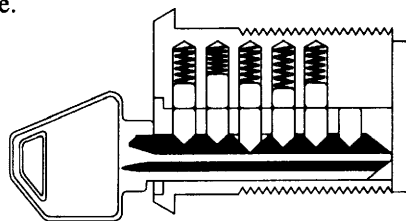


1012 Series blockout mortise cylinders and 3012 Series blockout rim cylinders are available exclusively with the Emhart High Security mechanism.

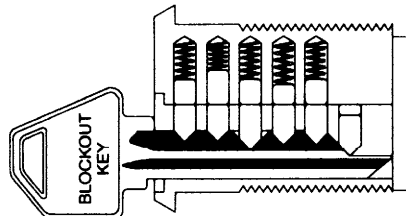
Blockout cylinders have two rows of top pins. The row at 12 o'clock is a complete, normal row in both the plug and shell. The "blockout row" at 11 o'clock in the shell, however, is incomplete. The 6th chamber is missing. Remember that the plug has all six pin chambers loaded.

The front 5 chambers are combined with high security pins, while the blockout chamber is combined with conventional pins.

All keys turn normally. This illustration shows a normal operating key turned to the blockout position. With no 6th chamber in the shell, the pins in the 6th chamber of the plug cannot move out of the way to clear the steeples at the end of the key. Therefore, it cannot be removed in this position and the user is not aware of any special feature.

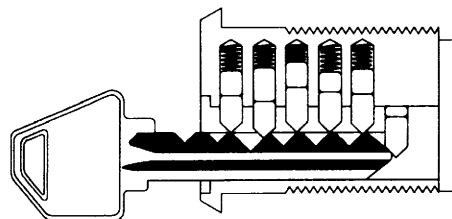


The blockout key has the last steeples removed, so it can be removed in the blockout position. This leaves the plug turned with a fully loaded chamber in the back.



While the cylinder is in the blockout mode, normal operating keys with the last steeples present are blocked by the pins in the 6th chamber of the plug. These pins have no place to move to clear the incoming key. Therefore, the normal keys (masters, changes, etc.) are temporarily blocked out.

The blockout key can be inserted again and turned to the 12 o'clock position to release the blockout function and when normal cylinder operation is again desired.



Keying System Design

The last chamber may not be used for change key progression. There must be a constant relationship between the operating keys and the blockout key in this position. The blockout key must be 2 increments deeper than the operating key.

The factory recommends using a 6 or 5 for the blockout key and a 4 or 3, respectively, for the operating keys. This creates a sufficient steeples at the tip of the key.

Brink Function Cylinders

Description and Application

Primarily used in minimum security detention facilities, the Brink function mortise cylinder is *handed*. It offers a change key which will only turn in one direction while the master key turns in both directions.

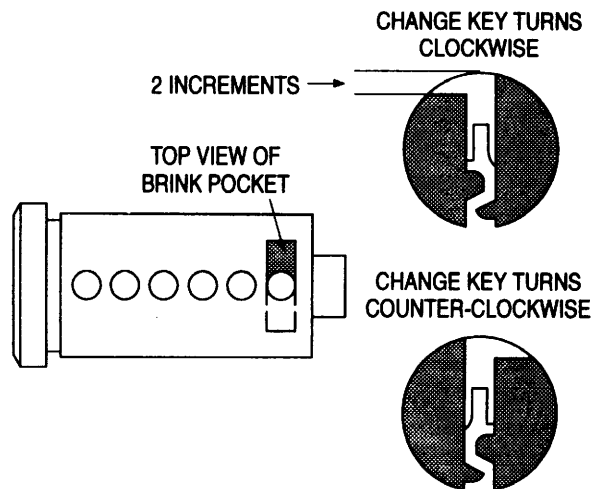
The cylinder was originally developed to operate in certain R. R. Brink Co. detention hardware. It also operates in other brands of similar products and can be used for a variety of custom security solutions totally unrelated to the detention market.

A non-detention related application for this cylinder could be an Adams Rite 4710 Series latch lock on the entrance of an office building, apartment building or hotel. The manager has the master which turns in both directions. It can set the holdback feature to leave the door unlocked during the day. At the end of the day, the latch is released, so the door remains locked when closed.

Employees or residents have the change key which only turns in the direction of latch retraction for after-hours entry. It cannot be turned to set the holdback feature and leave the building open through the night.

Limitations

The factory must know at the outset of a keying system whether Brink function cylinders are to be integrated. One chamber is reserved for the special function and no master keying progression can be done in that chamber. This severely limits the expansion available in a large system, so Brink function cylinders should have their own *separate* keying system if used within a larger job.



The proper cam and direction of travel must be verified before the cylinders are ordered for the hardware. In 1004 (conventional) and 1014 (high security) cylinders, the change key turns only *clockwise*. In 1005 and 1015 cylinders, it turns only *counter-clockwise*.

These cylinders are not usable in applications where 360° key rotation is required.

Operation

A pocket is milled to one side of one pin chamber. Typically, this is the 6th chamber. The change key uses a deep cut which lifts the bottom pin only to the bottom of the pocket. Thus, it can turn the plug only in the direction allowed by the missing material. The master key is two System 70 increments shallower to lift the bottom pin all the way up to the normal plug shear line. This allows the master key to turn in both directions.

Combining Procedure

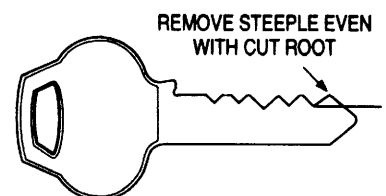
Note: Combine the high security version of the Brink function cylinder as any other Emhart high security cylinder, but use *conventional* pins in the 6th chamber. There can be no progression of angles in the last chamber, because conventional pins cannot distinguish between cut angles.

Keying System Design

The special chamber (normally #6) may not be used for change key progression. There must be a constant relationship between the change keys and the master key in this position. The master key must be 2 increments (or 4 in Pre-System 70) shallower than the change keys.

The factory recommends using a 6 or 5 for all change keys and a 4 or 3, respectively, for all master keys.

Removal of the steeple at the tip of the change keys will help guard against key picking.



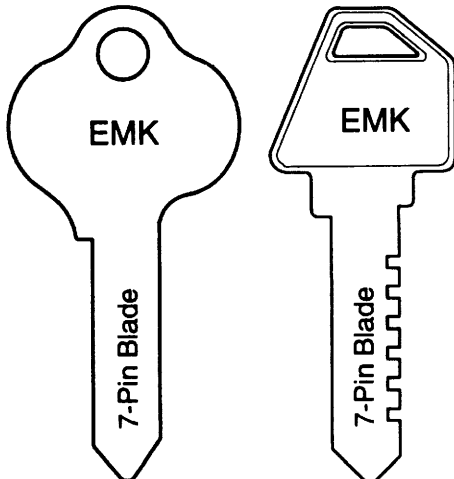
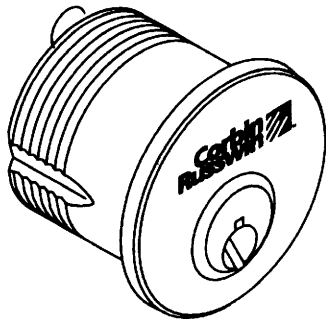
Unit 3 — Cylinder Construction and Combinating

Hotel Function Mortise — Conventional and High Security

During the long history of the company, there have been a wide variety of different mechanisms made to accommodate the special features needed for hotel locks. The most common are presented here.

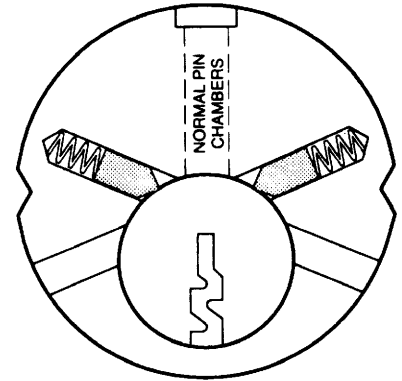
Mortise locks are most widely used for hotel guest rooms, so they will be presented first.

The standard 1001 and 1011 hotel function mortise cylinders use six pins for standard operation and for master keying progression.

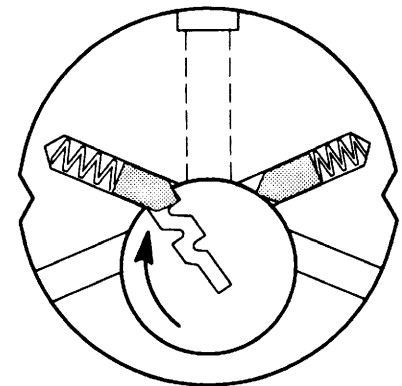


Behind the 6th chamber are a pair of small diameter diagonal pin chambers which contain the blocking pins and springs. There are two of these chambers in order to block rotation in both directions, allowing for a non-handed cylinder. The pin number is 197F52-7 and the spring is 26F75-7.

When no key is inserted, the blocking pins press against the surface of the plug. They remain there during most of the rotation of the normal keys.



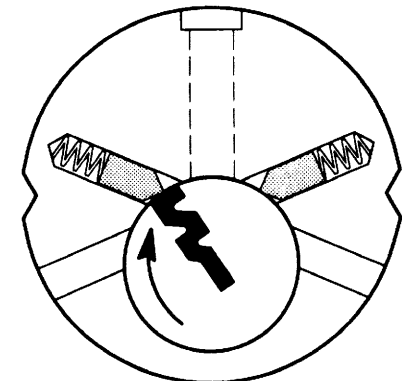
When the normal keys reach a certain rotation, the blocking pin enters the bottom of the key slot, preventing any further rotation in that direction. This is what prevents the 6-pin guest keys, maid's master keys and the grand master key from either projecting or retracting the dead bolt. They will only turn far enough to retract the latch.



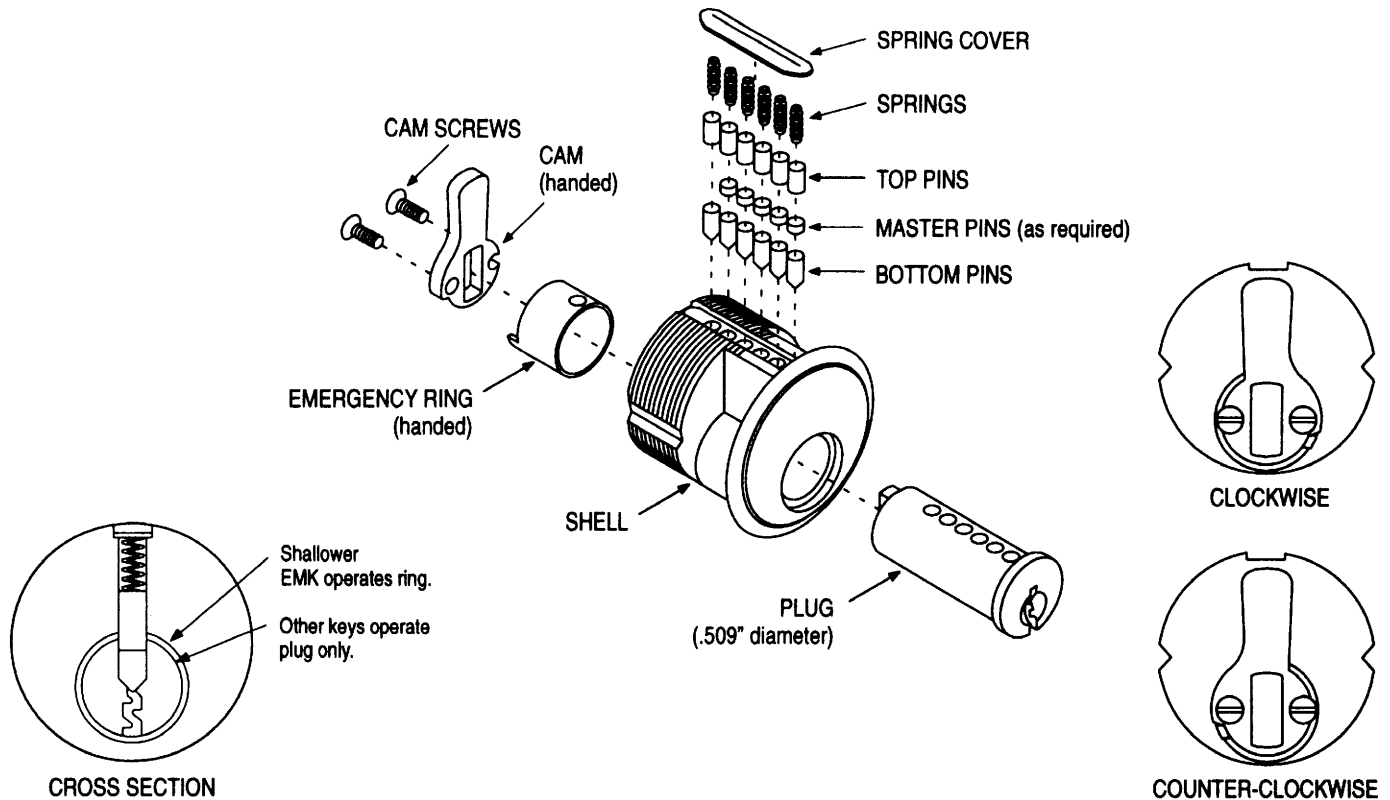
The emergency master key (EMK) and display key are cut on 7-pin blanks. The extra length of the key blade fills the gap in the bottom of the key slot, preventing the blocking pins from engaging, and allowing full 360° rotation in both directions to operate the dead bolt.

Emergency keys for these cylinders can use any standard 7-pin blank such as xx-7PIN-51. Note that there is no other use for the 7-pin high security key blank xx-7PIN-90 because Emhart high security cylinders are all 6-pin. The "xx" represents the key section in these key blank numbers.

While this function was designed specifically for hotel use, it can be used in other applications as a creative solution to certain security needs.



Old Style Corbin Hotel Function Mortise



Background

This cylinder was furnished for X Class hotel systems until 1969. There are still older motels full of them in the field, which locksmiths must service from time to time.

Corbin Russwin no longer makes parts for these cylinders. Plugs are not even available because the original ones were .509\" diameter, while today's mortise cylinders use .552\" plugs. However, you can still replace worn pins and inaccurate keys, or generate a new keying system for these old cylinders.

This cylinder used only X Class keyways and Pre-System 70 bitting specs because System 70 had been developed yet. Both the straight and the cloverleaf cam were used.

Operation

The back chamber has an emergency ring which restricts cam rotation and operates similar to the ring of a master ring cylinder. The ring and the cam are handed parts. The cam is cut away to allow limited rotation away from the tab projecting from the back of the emergency ring.

The ring is about .042\" thick, representing 3 increments. No master pins are used in this chamber. All normal operating keys such as guest keys, maid's master keys and the grand master key have a constant deep cut at the tip. These deeper keys only rotate the plug inside the stationary ring. Since the ring does not move, plug rotation is limited by the tab on the emergency ring to about 80° in one direction.

Remember that Corbin Pre-System 70 is **TIP** to **BOW** and 0 represents 10, the deepest cut.

The EMK is 3 increments shallower. It lifts the long bottom pin up to the shear line on the top of the emergency ring (without build-up pins!). Therefore, when the EMK turns, the ring turns together with the plug and cam, allowing a full 360° rotation in either direction.

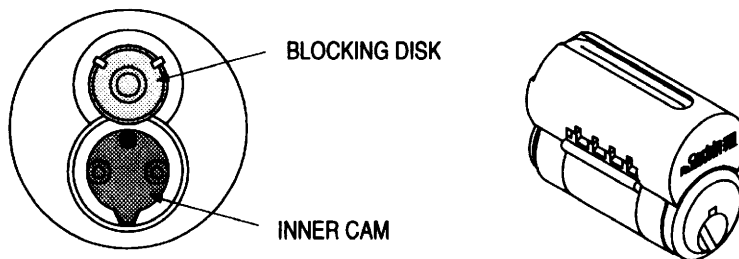
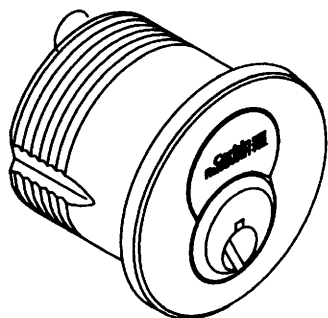
Typical bittings:

EMK 509800
TMK 809800

Master Keying Rules

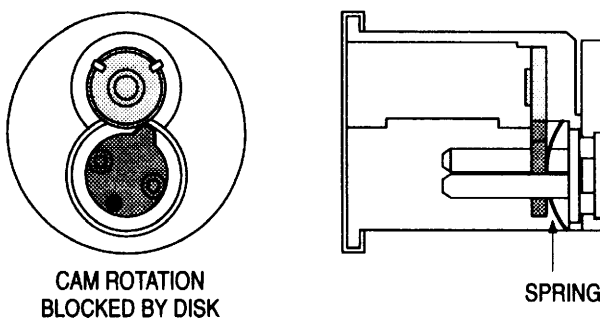
1. The tip cut of the TMK should be 8, 9 or 0.
2. The tip cut of the EMK is automatically 3 increments shallower than the TMK (5, 6 or 7, respectively).
3. The tip cut is constant, so master keying capacity is only that of a 5-pin system (1,024 theoretical changes.)
4. Remove the steeple from the tip of all keys other than the EMK to prevent them from key picking the emergency ring.

Hotel Function IC Mortise — Conventional and High Security

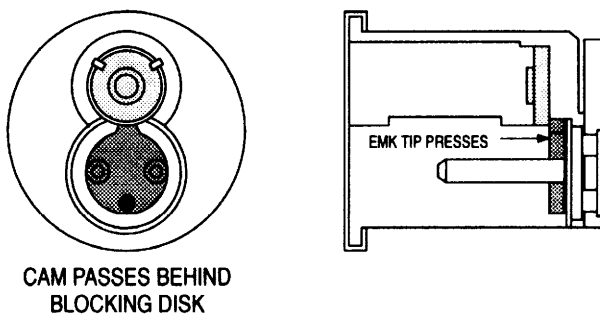


The 1081 and 1091 interchangeable core hotel function mortise cylinders operate on a different principle from other Corbin Russwin hotel function cylinders. They use a standard 6-pin core in the special 1071 hotel function housing.

There is a thin inner “cam” at the base of the throw member and a steel disk staked inside the housing at the back of the core bore. The thin cam is sprung forward so that it hits the steel disk when the normal keys are rotated. This blockage prevents the guest key, maid’s master key and grand master key from turning far enough to retract or project the dead bolt.



The EMK and display key have an extended tip which passes through the back of the core and presses against the thin cam. It forces the cam rearward against its own spring pressure so that it will pass *under* the steel disk. This clears the way for full 360° rotation of these special keys in both directions to operate the dead bolt.

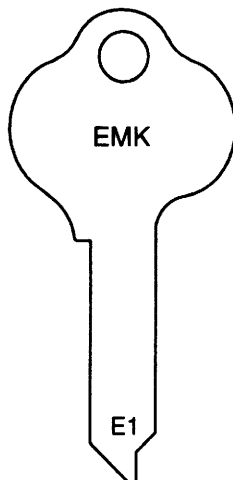


While this function was designed specifically for hotel use, it can be used in other applications as a creative solution to certain security needs.

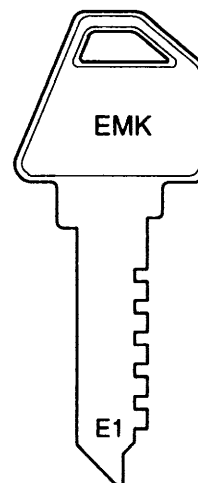
The key blanks for emergency and display keys are made from 7-pin blanks which are shortened and under cut at the tip.

In these key blank catalog numbers, substitute the key section for “xx”.

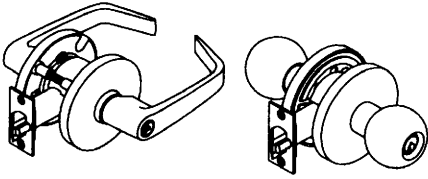
**For 1081
Conventional IC Mortise**
xx-6PIN-51-6E1



**For 1091
High Security IC Mortise**
xx-6PIN-90-6E1



Hotel Function Cylindrical – Conventional, IC and High Security



The cylinders for the many hotel function cylindrical locks are all different but the operating principle is identical, even for the IC versions.

The outer knob or lever is always locked. Pressing the button on the inside places the lock in the shut out mode. Closing the door or turning the inside knob or lever pops the button back out, to prevent guests from locking themselves out.

When in the shut out mode, the indicator pin extends from the plug face and a projection enters the rear of the keyway

at the bottom. This projection blocks the guest key, maid's master key and grand master key from fully entering the keyway.

The EMK and display key require an undercut tip to bypass the projection in the keyway. Thus, they enter the plug fully and operate the lock, even when it is in the shut out mode.

The shape of the undercut varies with the type of lockset, as designated by the E# suffix, shown below.

Caution: When testing keys in these cylinders, NEVER allow the EMK to turn 180°. The undercut can allow thin master pins in the last chamber of the shell to come into the bottom of the keyway and the cylinder will "rekey itself." *This can only happen while the cylinder is removed.*

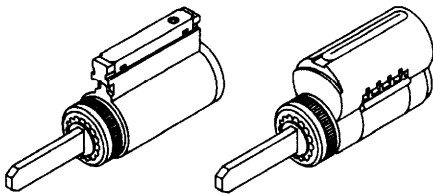


Spanner Key 041F47

The spanner key can be used by hotel management or by a guest with a display key to *turn* the inside button after it is pressed. This allows the lock to remain in the shut out mode as the door is closed.

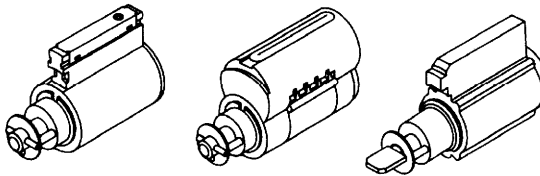
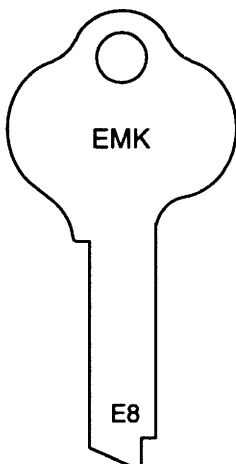
Hotel function locksets can be used in non-hotel applications as a creative solution to security needs.

In these key blank catalog numbers, substitute the key section for "xx".



**For CL3429, CL3629
6 or 7-Pin, Including IC**

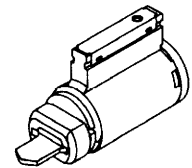
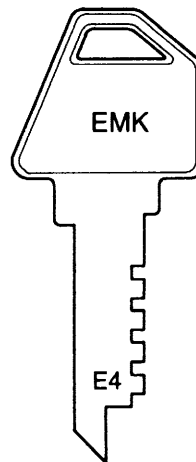
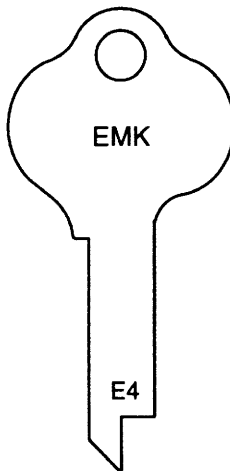
**xx-6PIN-51-E8
xx-7PIN-51-E8**



**For CK4229 Conv. and High Security,
Including IC and CK4429**

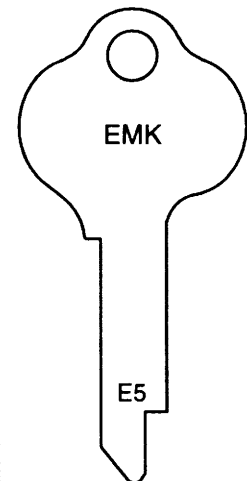
xx-6PIN-51-E4

xx-6PIN-90-E4

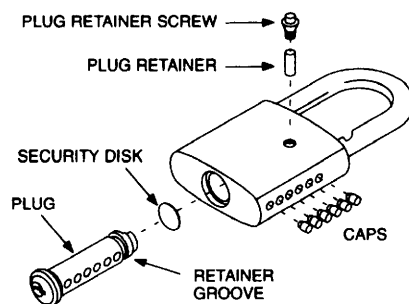


**For 1429, 4333EM,
5629, 3333EM**

xx-6PIN-51-E5



Standard Padlocks



Since padlocks are little more than cylinders with shackles, they are included in this manual. Padlocks have been available with these Corbin Russwin cylinder types:

- conventional pin tumbler
- master ring
- interchangeable core (standard & high security)
- figure-8 removable cylinder (standard & high security)
- figure-8 removable core

Many standard and master ring padlocks with the Corbin brand name have keyways, pinning and key biting specs of the Corbin Cabinet Lock Division, which was sold in 1985. For products to retrofit these keying systems, contact CCL Security Products at the address given near the beginning of Appendix A.

PL5000 Series

The current model is shown here. The plug is held in with a retaining pin concealed under a brass plug retainer screw. If you buy the padlock non-assembled, you may need to file the retainer groove in the plug for a proper fit with the retainer. Remove only enough material to prevent binding. **DO NOT** remove too much material, as this will cause end play and the key will have to be “pinched” to remove it.

Rekeying an Assembled Lock

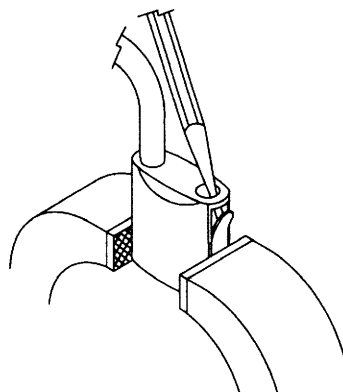
If you must rekey an assembled padlock, you will need a supply of replacement caps for the pin chambers. Never remove the plug for rekeying unless you must change the keyway. If you remove the plug, you will need a replacement plug retainer screw.

To remove the pin chamber caps, you must first locate them. A very light application against a wire wheel or piece of fine sandpaper may help if they are camouflaged by oxidation. Tap a mark into the center of each cap with a center punch. This often pushes the cap down below the surface of the lock. Spacing between centers is .156”.

Drill out the caps one by one. If you are sure you have marked the center of the cap, use a # 43 drill. Otherwise use a smaller size. As the drill breaks through the bottom of the cap, the cap will often spin. When this happens, the cap will usually come out with the drill. If it doesn't, use a small easy-out to remove the cap.

Do not use too large a drill bit, or miss the center of the cap. If this happens, you risk removing too much material in the pin chamber and the new cap may not hold when you reassemble the lock.

For old style locks, unlock the lock and place it in a vise as shown below. Using a drift or other small, sturdy instrument, knock the top end of the spring cover out.



Remove the lock from the vise and carefully pry the rest of the cover loose. No replacement parts are available from the factory. The old cover must be removed carefully enough to be reused. Once removed, straighten the spring cover. Then insert one edge into the vise and tap the cover into a tent shape for easier reassembly.

Combining Procedure

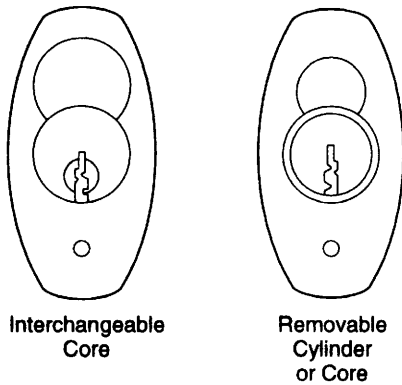
These padlocks cannot be serviced with a plug follower. They must be top loaded. Determine the bottom and master pins as described under Combining Conventional Cylinders earlier in this unit. If you are rekeying a master ring padlock, use the instructions under Combining Master Ring, also in this unit. In either case, use pins for .509” diameter plug and use .320” top pins in all chambers instead of the .171” used in standard cylinders.

Reassembly

After combining, test all keys and check for end play in the plug before beginning the resealing process. Use new tumbler springs. Firmly tap a new cap far enough into each pin chamber to be very snug and secure. For old style locks, tap the spring cover down flat into its cavity and peen around the edges to eliminate any large gaps.

Use a coarse file to remove the majority of the caps protruding from the surface. Finish off with a fine file, following the curvature of the padlock with each stroke to produce a smooth, uniform appearance.

Removable Cylinder and Removable Core Padlocks



How to Tell the Standard IC Lock From These Two

The PL5080 Series interchangeable core padlock uses today's standard core with both lobes of the figure-8 the same diameter. See the regular or high security IC section of this unit for core construction and combining.

In the removable core and the removable cylinder padlocks, the top lobe of the figure-8 is smaller than the bottom lobe.

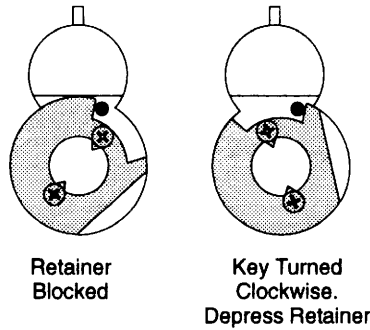
How to Tell the Removable Cylinder Model from the Removable Core Model

Both models look identical from the outside. If you unlock the padlock, you will see the small steel retaining pin or control lug down in the shackle hole. With the key turned all the way clockwise, try to depress the pin. If it depresses, it is the *removable cylinder* model and you can remove the cylinder. If it does not depress, you have the *removable core* model and must make a control key.

Removable Cylinder Model

This model was made from 1968 to about 1977. Instead of a control key, you must use a tool to remove this cylinder. Insert any operating key and unlock the padlock. While the key is still turned clockwise, just reach into the shackle hole with a small tool and depress the spring-loaded retainer. While the retainer is depressed, pull the cylinder out. If no keys are available, pick the plug clockwise, unlock and depress the retainer.

BACK VIEW



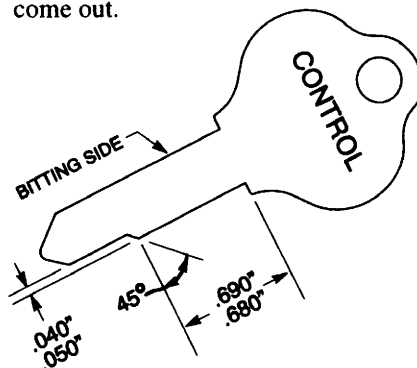
If the cylinder is high security, it cannot be serviced with a plug follower. Remove the spring cover and follow the high security combining instructions earlier in this unit.

If it is a conventional cylinder, remove the two screws on the back and service the cylinder with a .509" diameter plug follower (catalog # CT-4). Follow the instructions under Combining Conventional Cylinders earlier in this unit.

Removable Core Model

This is the original version of this padlock made from 1964 to about 1977. The core is installed and removed with a control key but it is NOT interchangeable in any other Corbin Russwin products.

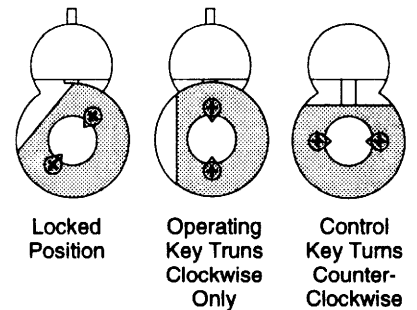
A ward pin is pressed into the shell between the 4th and 5th chambers to prevent keys from turning counterclockwise. You can make a control key from *any* operating key by undercutting the tip to bypass the ward as shown. If no key is available, impression one or pick the plug counterclockwise and the core will come out.



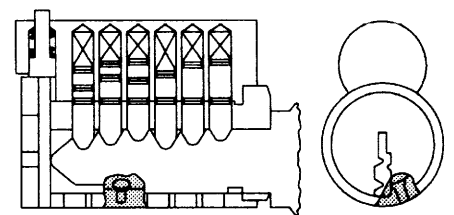
If the control lug (spring-loaded pin) is rusted and doesn't withdraw under its own spring pressure, unlock the lock first. Turn the plug back counterclockwise to the control position and insert a tool into the shackle hole to depress the control lug.

Once the core is out, remove the two screws on the back and service the cylinder with .509" diameter plug follower # CT-4. This follower has a slot which must be present to bypass the stop pin in the side of the shell.

BACK VIEW



SIDE VIEW



The plug must be turned slightly counterclockwise so the bottom of the keyway clears the stop pin in the side of the shell. Otherwise the plug is retained by this pin. Therefore, you must either use the control key or shim the plug to remove it.

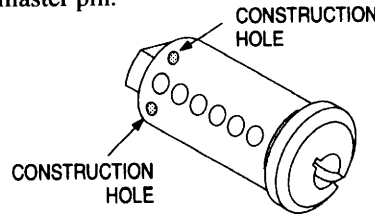
Other aspects of combining this core are the same as described under Combining Conventional Cylinders earlier in this unit.

Construction Master Keying

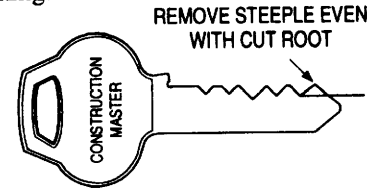
Construction master keying is a labor saving convenience feature. It allows a construction master key (CMK) to be used temporarily while the building is under construction.

When construction is completed, the end user cancels the CMK's operation simply by turning the change key in each cylinder, rather than replacing or rekeying the cylinder.

Cylinder plugs have small diameter "pockets" drilled at 40° on each side of one pin chamber. To do this in the field, use a #39 (.0985" - .1015") drill. Three .045" ball bearings are used in this chamber as a sort of "temporary master pin."

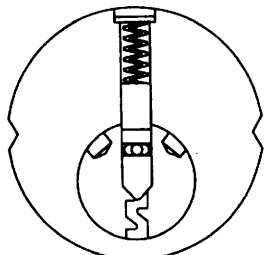


Normally, the last chamber is used, and the steeple should be removed from the tip of the CMK to guard against key picking.

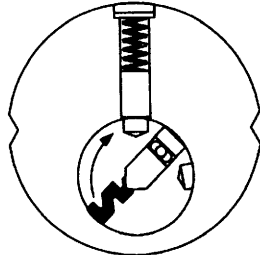


We will use System 70 depths to explain the illustrations below. See the facing page for Pre-System 70 numbers.

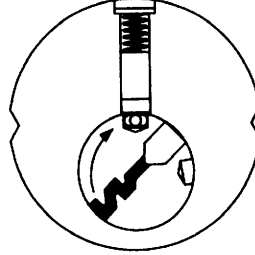
Standard Method: Change Key Voids CMK Operation



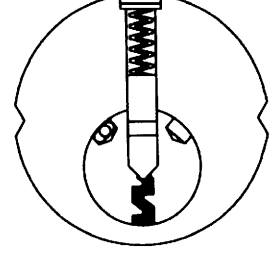
Rest position



CMK operates freely either direction



Change key turned either direction "loses" CM balls into pocket



CMK inserted

The cylinder in the first view has no key inserted. The balls are placed on top of the bottom pin in the standard method. The permanent master keys have a 4 cut and do not operate yet.

In the next view, the CMK, which always has a 5 1/2 (deep) cut, is inserted and turned. The diameter of the construction pockets in the plug is too small for any top pins or master pins to fall in as plug rotates.

In the third view, rotating the change key, cut to a 1, 2 or 3, lets the tiny balls drop into the pocket in the plug the first time the key turns in either direction.

In the last view, the balls have been captured in the pocket and there is no longer enough material in the chamber to allow the deep CMK biting to create a shear line.

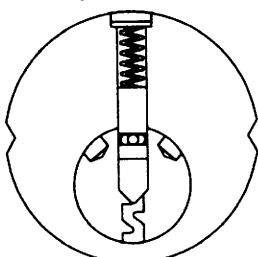
At this point, the only way to program the CMK back into the cylinder is to

dismantle the cylinder, remove the balls from the pocket and place them back into the pin stack.

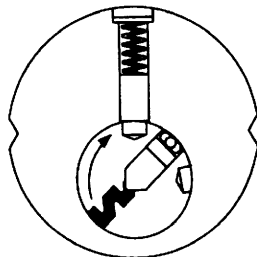
The four views below illustrate the option of placing the balls on the master pin rather than the bottom pin. When the cylinder is assembled this way, the permanent master key, rather than the change key, is what voids the CMK.

If you follow the master keying rules on the next page, the cylinder can be assembled either way.

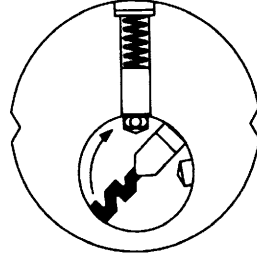
Secondary Method: Permanent Master Key Voids CMK Operation



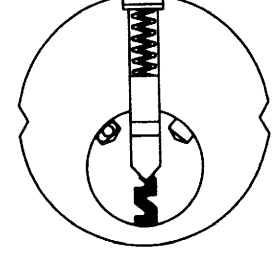
Rest position



CMK operates freely either direction



Permanent system's master key turned either direction "loses" CM balls into pocket



CMK inserted

Construction Master Keying

Limitations and Requirements

Construction master keying is very convenient but it reduces the overall expansion of a keying system. Also, it must be specified on the initial order for the system. Otherwise, the special CMK bitting may not be available later in the system's life.

The diameter of the balls is .045". This forces a direct relationship to exist between the CMK and the TMK. .045" is three increments in Pre-System 70 and 1¹/₂ increments in System 70.

System 70

The diameter of the ball bearings makes 5¹/₂ (symbolized by "%") the only practical depth for the CMK and forces the TMK to be a 4. The change keys can only be 1, 2 and 3. Neither the 5 nor the 6 is mechanically possible to use. Even if they were, they would be only half an increment away from the CMK.

CMK	1	2	5	4	6	%
TMK	1	2	5	4	6	4
Progression Possibilities	2	3	6	5	1	1
	3	4	1	6	2	2
	4	5	2	1	3	3
	5	6	3	2	4	
	6	1	4	3	5	

5 x 5 x 5 x 5 x 5 x 3 = 9,375
Theoretical Changes Per Keyway

When the CMK column of the KBA is multiplied by the rest of the columns, you can see that only ³/₅ of the system is available. In other words, 40% of the system is sacrificed to provide the convenience of construction master keying.

Pre-System 70

The diameter of the ball bearings makes the deepest cut (9 in Russwin and 0 in Corbin) the most practical depth for the CMK and forces the TMK to be three increments shallower (6 in Russwin and 7 in Corbin.) The change keys can only be the three progressives shallower than the TMK. Neither 8 nor 9 is mechanically possible to use. Even if they were, they would be only one increment away from the CMK.

CMK	1	4	9	7	2	9
TMK	1	4	9	7	2	6
Progression Possibilities	3	6	1	9	4	0
	5	8	3	1	6	2
	7	0	5	3	8	4
	9	2	7	5	0	

4 x 4 x 4 x 4 x 4 x 3 = 3,072
Theoretical Changes Per Keyway

When the CMK column of the KBA is multiplied by the rest of the columns, you can see that only ³/₄ of the system is available. In other words, 25% of the system is sacrificed to provide the convenience of construction master keying.

When a CMK must be added to an existing Pre-System 70 keying system that has no bittings available to follow these rules, a special extra-deep bitting may sometimes be used. A Corbin 11 or Russwin 10 depth on the CMK where an 8 (Corbin) or 7 (Russwin) is used on the TMK. These depths are shown in Appendix A.

Interchangeable Core Alternative

Corbin Russwin interchangeable cores can be construction master keyed. However, a construction core program was begun in 1993. With this option, a temporary group of keyed alike cores is furnished for IC jobs, rather than construction master keying the permanent cores.

Construction cores offer two strong advantages to the building owner:

1. No additional combinations are lost because there is no construction master keying.
2. Security is improved because the construction keys have no direct or predictable relationship to the permanent master keys and are usually even on a different key section.

General Information

Pin Change Notice

Because of the many key classes, depth systems and plug diameters, Corbin Russwin has consolidated its pin lengths for decades. This means that if a .160" pin was required for one set of specs, a .161" for another and .162" for yet another, only the .161" would be produced. It would serve triple duty.

With the sale of the Corbin Cabinet Lock (CCL) division in 1985 and the correction to the N Class bottom pins in 1990, it was time to undertake a new study for pin consolidation in creating the new pin kits introduced in 1993.

The new pins and kits on the next few pages, together with the pins listed in Appendix A reflect the consolidation determined to be necessary in the 1993 study. *Nothing has changed in keys or cylinder plugs.* Only the pin sizes were reevaluated to get closer to the nominal length. This results in smoother operating cylinders.

Impact on Pin Kits

If you are using one of the many different Corbin or Russwin original pin kits prior to the PK series kits (see page 56), you should relabel its compartments with the new lengths or discard it and purchase a new kit. Old lengths not carried over to the 1993 consolidation will be discontinued when inventory is depleted.

Aftermarket Colored Pin Kits

Many fine quality aftermarket pin kits are available to locksmiths. Most use colored pins. Such kits are practical if you service different manufacturers' cylinders. There are some disadvantages, however, when used for Corbin Russwin cylinders.

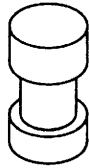
- The charts these kits have for Corbin Russwin are sometimes inaccurate and always incomplete. 22 different charts would be necessary to cover all Corbin Russwin variations in biting class / depth system / plug diameter, as provided in Appendix A!
- Color pins can be a security risk, since the bottom pins can be viewed with an otoscope through the keyway and decoded.
- The geometry of these pins usually differs from that of original Corbin Russwin pins. Corners are often sharper, producing an occasional bind, and a need to shorten the pin by one size (.003" or .005").
- Some kits do not have top pins long enough to accommodate the longest build-up pins for Corbin Russwin interchangeable core and master ring cylinders.
- Sizing is generally in even increments of .003" or .005". For this reason, the ideal size may NOT be the size closest to the consolidated size in Appendix A.

To create the best charts for your .003" or .005" kits, refer to the "nominal" or ideal pin length column in each section of the next two pages. The second number is the size used in older pin kits and the last size is the size from the 1993 consolidation.

Pin Options

Spool Top Pins

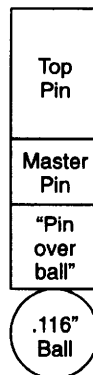
Spool top pins are used to increase pick resistance. They are available in three sizes, designated by the letter "J" followed by the length in thousandths of an inch. They are: J171, J230, J320 and J415.



Do not put spool top pins in all chambers. Always use a standard top pin in the back chamber to hold the plug in position until the key is fully inserted.

Ball Bearing Bottom Pins

You will find a ball bearing at the bottom of pin stacks in some or all chambers of Corbin and Russwin cylinders manufactured from about 1902 until the mid 1960's. The oldest cylinders have the ball in every chamber. The number of balls was gradually reduced until only the front two chambers had them.



The purpose of the balls was to reduce wear on the pins. As harder brass became available, wear became less of a factor, so usage of the balls in the pin stacks was eventually phased out. However, the balls themselves are still available because they are used in other Corbin Russwin products.

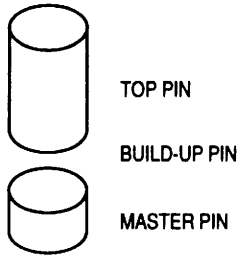
If you have a problem with pin wear in high traffic cylinders, consider rekeying the cylinder with these balls. They are compatible with all current Corbin Russwin cylinders except high security.

159F36-7
Stainless
Ball

Order them in multiples of 100 from your Corbin Russwin distributor. The diameter is .116" so select the size of the pin over the ball accordingly.

Note: Do not use a ball in every chamber. This creates a security risk because a bypass tool called a "lock comb" can be used to raise all balls to the shear line and operate the cylinder.

Top Pin Size Comparison



This page provides the same information for master and build-up pins as the facing page does for bottom pins. Headings for the small columns have been explained on the facing page.

Master and build-up pins are based on the increment. Since different key classes may share the same increment, there are fewer lists than there are for bottom pins. M = master pin and BU = build-up pin.

.014"/.028" Increment					.015" Increment					.020" Increment				
Pre-System 70 Corbin and all System 70					Pre-System 70 Russwin					Russwin 752, 852 and A Class				
Plug	Label	Nom.	Old	93	Plug	Label	Nom.	Old	93	Plug	Label	Nom.	Old	93
both	M2 / M1	28	28	28	both	M2	30	30	30	both	M2	40	42	40
both	M3	42	42	42	both	M3	45	45	45	both	M3	60	59	60
both	M4 / M2	56	56	56	both	M4	60	59	60	both	M4	80	79	80
both	M5	70	69	70	both	M5	75	75	75	both	M5	100	99	100
both	M6 / M3	84	83	84	both	M6	90	90	90	both	M6	120	121	120
both	M7	98	99	98	both	M7	105	105	105		BU -6	43	42	42
both	M8 / M4	112	112	112	both	M8	120	121	120	509	BU -5	63	65	63
both	M9	126	127	126	both	M9	135	135	135	509	BU -4	83	83	82
both	M5	140	140	140						509	BU -3	103	102	103
509	BU -9	37	37	37	509	BU -9	28	28	28	509	BU -2	123	121	122
509	BU -8 / -4	51	51	51	509	BU -8	43	42	42	509	BU -1	143	143	142
509	BU -7	65	65	66	509	BU -7	58	56	58	509	BU 0	163	163	163
509	BU -6 / -3	79	79	80	509	BU -6	73	73	72	509	BU +1	183	185	184
509	BU -5	93	93	93	509	BU -5	88	87	87	509	BU +2	203	203	202
509	BU -4 / -2	107	107	107	509	BU -4	103	102	103	509	BU +3	223	222	222
509	BU -3	121	121	120	509	BU -3	118	116	118	509	BU +4	243	241	241
509	BU -2 / -1	135	135	135	509	BU -2	133	132	133	509	BU +5	263	263	261
509	BU -1	149	149	149	509	BU -1	148	147	149	509	BU +6	283	282	282
509	BU 0	163	163	163	509	BU 0	163	163	163					
509	BU +1	177	177	177	509	BU +1	178	177	177	552	BU -5	42	42	42
509	BU +2 / +1	191	191	192	509	BU +2	193	191	192	552	BU -4	62	65	63
509	BU +3	205	205	205	509	BU +3	208	207	208	552	BU -3	82	83	82
509	BU +4 / +2	219	219	218	509	BU +4	223	222	222	552	BU -2	102	102	103
509	BU +5	233	233	232	509	BU +5	238	237	238	552	BU -1	122	121	122
509	BU +6 / +3	247	247	247	509	BU +6	253	252	253	552	BU 0	142	143	142
509	BU +7	261	261	261	509	BU +7	268	268	268	552	BU +1	162	163	163
509	BU +8 / +4	275	275	275	509	BU +8	283	282	282	552	BU +2	182	185	184
509	BU +9	289	289	289	509	BU +9	298	297	298	552	BU +3	202	203	202
509	BU +5	303	303	303						552	BU +4	222	222	222
552	BU -8 / -4	30	30	30	552	BU -7	37	37	37	552	BU +5	242	241	241
552	BU -7	44	45	45	552	BU -6	52	53	51	552	BU +6	262	263	261
552	BU -6 / -3	58	59	58	552	BU -5	67	69	66					
552	BU -5	72	73	72	552	BU -4	82	83	82					
552	BU -4 / -2	86	87	87	552	BU -3	97	99	98					
552	BU -3	100	102	100	552	BU -2	112	112	112					
552	BU -2 / -1	114	116	114	552	BU -1	127	127	126					
552	BU -1	128	129	128	552	BU 0	142	143	142					
552	BU 0	142	143	142	552	BU +1	157	157	156					
552	BU +1	156	157	156	552	BU +2	172	172	171					
552	BU +2 / +1	170	172	171	552	BU +3	187	188	187					
552	BU +3	184	185	184	552	BU +4	202	203	202					
552	BU +4 / +2	198	199	198	552	BU +5	217	219	218					
552	BU +5	212	213	212	552	BU +6	232	233	232					
552	BU +6 / +3	226	227	226	552	BU +7	247	247	247					
552	BU +7	240	241	241	552	BU +8	262	263	261					
552	BU +8 / +4	254	255	253	552	BU +9	277	278	277					
552	BU +9	268	268	268										
552	BU +5	282	282	282										

When two depth labels are given above, the one before the slash is Pre-system 70 and the one after the slash is System 70.

Pin Kits -- Old and New

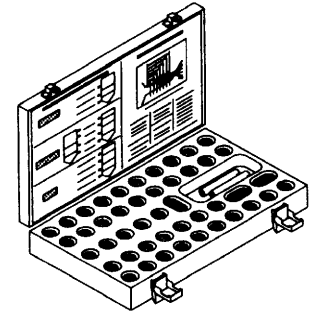
Yesterday's pin kits are often unusable for today's Corbin Russwin cylinders. Most calls to the factory for help are from institutional locksmiths who are trying unsuccessfully to key a new Corbin Russwin cylinder with an old pin kit that the institution has had for a long time. If you are trying to pin modern Corbin Russwin cylinders with old pin kits, there will be times when the old kit may not work. Here are the most common reasons.

- Most kits were specific to one key class and depth system and your cylinder may require different specs.
- Most kits were limited to one plug diameter and today's complete

product offering includes two diameters.

- Kits which were supposed to include Russwin N Class keyways had the wrong size bottom pins.
- The design of certain kits for interchangeable core and master ring overlooked some sizes of build-up pins.

Below is a listing of all known original Corbin and Russwin pin kits and what they are actually capable of handling. In many cases, this will be less than the kit claims to handle, especially where N Class keyways are concerned, for reasons stated above. The approximate dates of their offering are also given.



We strongly recommend the purchase of one of the new PK Series pin kits introduced in 1993 if you routinely combine Corbin Russwin cylinders. The new kits appear first in the listing below. Their exact contents are listed on the next page.

Kit Number	Bitting Classes	Depth System	Plug Diameter	Remarks
PK-70-HS	Z, DH	70	.552"	all high security cylinders including Brink, blockout and IC, plus .552" conventional
PK-70-N	N	70	both	all cylinders with these keyways using System 70 depths
PK-70-X	X	70	both	all cylinders with these keyways using System 70 depths
PK-70-ZDH	Z, DH	70	both	all cylinders with these keyways using System 70 depths
PK-1070	all	all	both	deluxe kit for all non-high security cylinders
03-1/2	X, Z	Pre-70	.509"	master, build-up & top pins only (1967 - 75)
53	X, Z	Pre-70	X .509", Z .552"	bottom & master pins (1967 - 75)
53-MR	X, Z	Pre-70	.552"	master, build-up & top pins only (1967 - 75)
A	981	Pre-70	.552"	master, regular & ball bearing bottom pins (1955 - 66)
B	981	Pre-70	.552"	ball bearing bottom pins only (1955 - 66)
C	DH, 981	Pre-70	.552"	bottom & master pins; wrong N Class bottom pins (1967 - 75)
C-1	X, Z	Pre-70	.509"	no build-up pins longer than +2 (1976 - 91)
C-2	X, Z	70	Z both, X .552"	IC & master ring, except X Class .509" plug (1976 - 91)
C-3	X, Z	both	.552"	master ring, missing 7 sizes (1976 - 91)
C-4	X, Z	both	.509"	complete set of master & build-up pins only; no bottom pins (1976 - 91)
C-6	X, Z	both	both	deluxe kit for all Corbin; Chart shows wrong X Pre-70 .552" BU (1986 - 92)
C-10	Z	both	.552"	no IC or master ring but includes spare cylinder parts (1976 - 91)
E-8	-----	-----	-----	for IC N Class but all bottom pins are too short (1971 - 75)
E-10	DH, 981	both	.552"	includes spare cylinder parts; wrong N class bottom pins
F-8	DH	Pre-70	.509"	for IC but has no build-up pins longer than +2 (1971 - 75)
K-1	X	Pre-70	.509"	bottom pins & springs only (1955 - 66)
K-4	S	n/a	.398"	Corbin small pin residential knob locks (1957 - 66)
K-51	Z	Pre-70	.552"	bottom pins and spring only (1961 - 66)
L-2	X, Z	70	Z both, X .552"	IC & master ring, except X Class .509" plug (1976 - 85)
L-3	X, Z	both	.552"	master ring, missing 7 sizes (1976 - 85)
L-4	X, Z	both	.509"	complete set of master & build-up pins only; no bottom pins 1976 - 85
L-5	CCL small	4R, B4R	.398"	for CCL small pin cabinet locks (1976 - 85)
MK-2	X	Pre-70	.509"	bottom, master and ball bearing bottom (1955 - 1966)
MK-52	Z	Pre-70	.552"	bottom, master and ball bearing bottom (1961 - 66)
MR-D	DH, N, 981	Pre-70	.552"	master, build-up & top pins only (1967 - 75)
P-82	X	Pre-70	.509"	IC missing build-up pins beyond +1 (1971 - 75)
P-85	Z	Pre-70	.509"	IC missing build-up pins beyond +1 (1971 - 75)
R-1	DH	Pre-70	.509"	IC missing build-up pins beyond +2; wrong N Class bottom pins (1971 - 75)
R-2	DH	70	both	IC and master ring; missing +4 build-up pin for .509" plug (1971 - 75)
R-3	D, H, 981	Pre-70	.552"	master ring; missing #5 master pin and +5 build-up pin (1976 - 91)
R-6	DH, 981	both	both	deluxe Russwin kit. Wrong N Class bottom pins until late '92. (1986 - 93)
UB	S	n/a	.398"	Russwin small pin residential knob locks (1957 - 66)
W70-8	Hi Sec.	70	.552"	high security, including IC. Wrong build-up pins until mid '90. (1979 - 92)
W70A	Hi Sec.	70	.552"	high security only; no conventional pins for IC, blockout or Brink (1976 - 91)

Pin Kits -- Contents of PK Series

PK-70-ZDH		PK-70-N		PK-70-X		PK-1070		PK-70-HS			
Size	Qty	Size	Qty	Size	Qty	Size	Qty	Size	Qty		
L160	72	L165	72	L171	72	L160	72	M075	100	L231	72
L189	72	L193	72	L198	72	L165	72	M080	100	L260	72
L203	72	L208	72	L213	72	L171	72	M082	100	L288	72
L217	72	L220	72	L228	72	L175	72	M084	100	L316	72
L231	72	L236	72	L241	72	L177	72	M087	100	L344	72
L245	72	L248	72	L256	72	L186	72	M090	100	M028	200
L260	72	L263	72	L269	72	L189	72	M093	72	M030	100
L273	72	L276	72	L283	72	L193	72	M098	72	M056	200
L288	72	L291	72	L297	72	L198	72	M100	72	M058	100
L301	72	L305	72	L311	72	L201	72	M103	72	M084	100
L316	72	L320	72	L326	72	L203	72	M105	72	M087	100
L344	72	L349	72	L354	72	L208	72	M107	72	M112	72
M028	200	M028	200	M028	200	L213	72	M112	72	M114	72
M030	200	M030	200	M030	200	L217	72	M114	72	M142	72
M051	100	M051	100	M051	100	L220	72	M118	72	M171	72
M056	200	M056	200	M056	200	L228	72	M120	72	M198	72
M058	100	M058	100	M058	100	L231	72	M122	72	M226	72
M060	100	M060	100	M060	100	L234	72	M126	72	M253	72
M080	100	M080	100	M080	100	L236	72	M128	72		
M084	200	M084	200	M084	200	L241	72	M133	72	High Security Pins:	
M087	100	M087	100	M087	100	L245	72	M135	72	407T41-4242	20
M107	72	M107	72	M107	72	L248	72	M140	72	407T41-4270	20
M112	100	M112	100	M112	100	L251	72	M142	72	407T41-4298	20
M114	72	M114	72	M114	72	L256	72	M149	72	407T41-4326	20
M135	72	M135	72	M135	72	L260	72	M156	72	407T41-4354	20
M140	100	M140	100	M140	100	L263	72	M163	72	407T42-4242	20
M142	72	M142	72	M142	72	L267	72	M171	72	407T42-4270	20
M163	72	M163	72	M163	72	L269	72	M177	72	407T42-4298	20
M171	144	M171	144	M171	144	L273	72	M184	72	407T42-4326	20
M192	72	M192	72	M192	72	L276	72	M187	72	407T42-4354	20
M198	72	M198	72	M198	72	L279	72	M192	72	407T31-4097	20
M218	72	M218	72	M218	72	L283	72	M198	72	407T31-4125	20
M226	72	M226	72	M226	72	L288	72	M202	72	407T31-4153	20
M247	72	M247	72	M247	72	L291	72	M205	72	407T32-4097	20
M253	72	M253	72	M253	72	L294	72	M208	72	407T32-4125	20
M275	72	M275	72	M275	72	L297	72	M212	72	407T32-4153	20
M282	72	M282	72	M282	72	L301	72	M218	72	407T33-4097	20
M303	72	M303	72	M303	72	L305	72	M222	72	407T33-4125	20
M320	72	M320	72	M320	72	L307	72	M226	72	407T33-4153	20
J172	72	J172	72	J172	72	L311	72	M232	72	407T43-4193	50
Tools:		Tools:		Tools:		L316	72	M238	72	407T43-4158	100
.509" follower	1	.509" follower	1	.509" follower	1	L320	72	M241	72	Tools:	
.552" follower	1	.552" follower	1	.552" follower	1	L322	72	M247	72	tweezer	1
tweezer	1	tweezer	1	tweezer	1	L326	72	M253	72	Other Parts:	
CT-11 key gauge	1	CT-21 key gauge	1	CT-11 key gauge	1	L330	72	M261	72	172F21-7	100
Other Parts:		Other Parts:		Other Parts:		L334	72	M268	72	603F20-7	100
172F21-7	100	172F21-7	100	172F21-7	100	L337	72	M275	72	217F44-2	50
603F20-7	100	603F20-7	100	603F20-7	100	L340	72	M277	72	CM balls	300
217F44-2	50	217F44-2	50	217F44-2	50	L344	72	M282	72	438F41-8	20
CM balls	300	CM balls	300	CM balls	300	L349	72	M289	72		
438F41-8	20	438F41-8	20	438F41-8	20	L354	72	M298	72		
						M028	200	M303	72		
						M030	200	M320	72		
						M037	100	J172	72		
						M040	100	Tools:			
						M042	100	.509" follower	1		
						M045	100	.552" follower	1		
						M051	100	tweezer	1		
						M056	200	Other Parts:			
						M058	100	172F21-7	100		
						M060	100	603F20-7	100		
						M063	100	217F44-2	25		
						M066	100	CM balls	300		
						M070	100				
						M072	100				

1993 Consolidation -- Numerical Listing

Use this listing to verify the availability of any particular pin. Distributors can also use this list as a guideline for inventory levels. The more uses a given pin has, or the more popular a key class and depth system it is used for, the more you should stock.

Special Canadian usage is not reflected in these lists.

Pins are sold in vials of 100. The "catalog number" of a pin consists of a letter followed by the actual measurement of the pin in thousandths of an inch. L Series pins are bottom pins. M Series are master, build-up and top. J Series are spool top pins for pick resistance.

When ordering a vial of pins, use the correct part number:

bottom pins 553F48-4 + length
 master/build-up/top 553F49-2 + length
 spool top pins 553F50-2 + length

Example: a #1 master pin for System 70 has a catalog number of M028. To order 200 of these pins, order a quantity of two 553F49-2028.

Bottom Pins

After each pin size is a shorthand listing of the key class(es) and plug diameter(s) to which it applies. Most of this shorthand is clear but "7" designates 752 Class and "8" designates 852 Class. DH in this listing also includes 981 class. "70" designates System 70.

L160	DH, Z, ZDH70 509
L165	N70 509
L171	X, X70, N 509
L175	Z 509, DH 509
L177	A 509
L186	X, N, 7 509
L189	Z, ZDH70, DH 509
L193	8, N70 509
L198	A, X, X70 509
L201	N 509
L203	DH, Z 509; DH, Z 552
L208	7 509, N70 552
L213	X, 8 509; X, X70, N 552
L217	A, N, Z, ZDH70 509; DH, Z 552
L220	DH, N70 509; A 552
L228	X, X70, 7 509; X, N 552
L231	Z, N, 8 509; DH, Z, ZDH70, 7 552
L234	DH 509, 8 552
L236	A 509, N70 552
L241	X 509; A, X, X70 552
L245	N, Z, ZDH70 509; N, Z 552
L248	N70, 7, DH 509; DH 552
L251	8 509, 7 552
L256	X, X70, A 509; X, 8 552
L260	N, Z 509; A, N, Z, ZDH70 552
L263	DH 509; N70, DH 552
L267	7 509
L269	X 509; X, X70, 7 552
L273	Z, ZDH70, 8 509; Z, N 552
L276	A, N, N70 509; 8, DH 552
L279	DH 509, A 552
L283	X, X70 509; X 552
L287	Z 509
L288	7 509; N, Z, ZDH70 552
L291	N, 8 509; N70, DH, 7 552
L294	DH 509, 8 552
L297	A, X 509; X, X70 552
L301	ZDH70 509; A, Z 552
L305	N70 509, N 552
L307	N, 7 509; DH 552
L311	X70, 8 509; X, 7 552
L316	Z, ZDH70, 8 552
L320	A, N, N70 552
L322	DH 552
L326	X 552 / X70
L330	Z, 7 552
L334	N, 8 552
L337	DH 552
L340	A, X 552
L344	ZDH70 552
L349	N, N70, 7 552
L354	X70, 8 552

Spool Pins

The purpose of these optional pins is covered earlier in this unit.

J171	standard cylinders
J240	master ring cylinders
J320	padlocks
J415	to block master ring

Top Pins

This list includes master pins, build-up pins and top pins. The shorthand

description begins with the increment in thousandths of an inch. Corbin Pre-System 70 is 14, Russwin Pre-System 70 is 15, old Russwin is 20. System 70 is 28, so many of the pins listed as 14 double as System 70 pins.

After the increment number will be either the plug diameter for build-up pins or the letter M to designate a master pin.

M028	14/28M, 15-509
M030	14-552, 15M
M037	14-509, 15-552
M040	20M
M042	14M, 14-552, 15-509, 20-509, 20-552
M045	15M
M051	14-509, 15-552
M056	14/28M
M058	14-552, 15-509
M060	15M, 20M
M063	20-509, 20-552
M066	14-509, 15-552
M070	14M
M072	14-552, 15-509
M075	15M
M080	14-509, 20M
M082	15-552, 20-509, 20-552
M084	14/28M
M087	14-552, 15-509
M090	15M
M093	14-509
M098	14M, 15-552
M100	14-552, 20M
M103	15-509, 20-509, 20-552
M105	15M
M107	14-509
M112	14/28M, 15-552
M114	14-552
M118	15-509
M120	14-509, 15M, 20M
M122	20-509, 20-552
M126	14M, 15-552
M128	14-552
M133	15-509
M135	14-509, 15M
M140	14/28M
M142	all-552
M149	14-509, 15-509
M156	14-552, 15-552
M163	all-509, 20-552
M171	14-552, 15-552
M177	14-509, 15-509
M184	14-552, 20-509, 20-552
M187	15-552
M192	14-509, 15-509
M198	14-552
M202	15-552, 20-509, 20-552
M205	14-509
M208	15-509
M212	14-552
M218	14-509, 15-552
M222	15-509, 20-509, 20-552
M226	14-552
M232	14-509, 15-552
M238	15-509
M241	14-552, 20-509, 20-552
M247	14-509, 15-552, IC top
M253	14-552, 15-509
M261	14-509, 15-552, 20-509, 20-552
M268	14-552, 15-509
M275	14-509
M277	15-552
M282	15-509, 20-509, 28-552
M289	14-509
M298	15-509
M303	14-509

Key Bitting and Pin Specifications

The next several pages contain pin lengths and key bitting specs for Corbin Russwin keys.

Use this section to:

- determine the key class and depth system of your keys
- select proper pin lengths when combining cylinders
- verify the accuracy of the specs for the various after-market key coding machines
- verify the accuracy of keys cut in the field
- verify the accuracy of pins used in the field

Pin Sizes

Considerable space has already been devoted to explaining Corbin Russwin's consolidation of pin sizes. The pins listed in this Appendix represent the 1993 consolidation.

Discontinued Keyways

Keyways no longer offered by Corbin Russwin are included because the locks are still encountered by today's locksmiths.

Corbin Cabinet Lock Keyways

The CCL Division was sold in 1987. Contact CCL Security Products
199 Whiting Avenue
New Britain, CT 06058
(203) 229-6199, fax 223-7601.



CANADA ONLY

Canadian Differences

Most Canadian Corbin Russwin keying systems generated before 1983 deviate from U.S. depth and pin specifications. If you are servicing Canadian cylinders, you need the special Canadian Supplement to this Appendix.

Key Machine Problems

All key machines should be checked for accuracy periodically by cutting a key, measuring its depths, and comparing the measurements to the specifications furnished by the manufacturer of the machine.

Manufacturers of these machines have not always had access to factory key bitting specs. They often had to measure keys in the field to reverse engineer the dimensions, and have met this challenge with varying degrees of accuracy. Whether the depth and spacing for your key coding machine is computerized, printed in the machine's manual or contained on a "code card", compare it with the appropriate page of this Appendix and correct it where necessary before using it for Corbin Russwin keys.

Correcting HPC Code Cards

The HPC 1200CM code machine uses code cards for depth and spacing. Because of that machine's popularity, we include the card numbers in this Appendix.

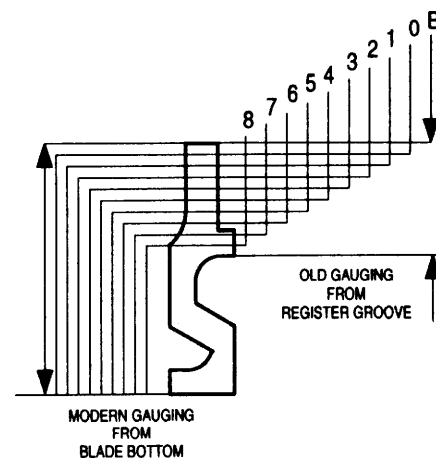
In 1994, HPC began to update and correct its code cards. The card numbers printed on the following pages are the newest, corrected cards.

Many older cards deviated from factory depths and should be replaced with the new version or corrected in the field before use.

Each card has the depths printed on it. Compare them with the depths printed here to determine where corrections are necessary. *After you are sure the machine is properly adjusted*, pencil in new depth marks. One of the modern white plastic micrometer cards supplied with the machine may ease this process. (Older ones were inaccurate.) Cut a key to the new depth marks and measure the results. Move the pencil marks if necessary. Make a new key and repeat the process. When all marks are correct, ink them in.

Russwin Peculiarities

Today, key bitting specs are based on a *root depth* which is the distance from the bottom of the blade to the bottom of the cut root. Originally, most Russwin key depths were gauged from a feature in the key section called a *register groove*.



This groove in original Russwin key blanks was tightly toleranced to match a corresponding ward in the keyway. The bottom of the key did not seat on the inside of the plug bore at the bottom of the keyway. The factory's key bitting machinery holds these blanks by the register groove, but key machines in the field cannot do this.

In 1961, all existing Russwin keyways and key sections were re-toleranced to be gauged from the bottom of the key blade. If you have trouble duplicating older Russwin keys, this may be the root of the problem. Keys may not operate properly even if the root depths match from one key to the other.

If this happens, it is most likely the result of using non-original key blanks, but it can also occur with original blanks, depending upon how old the cylinder, the pattern key and the key blank are.

Appendix A — Key Bitting Specs and Pin Lengths

Corbin Russwin Z and DH Class - System 70

Applies to these keyways:

60
70

59A1
59A2

59B1
59B2

59C1
59C2

59D1
59D2

D1 thru D4
H1 thru H8
L1 thru L4

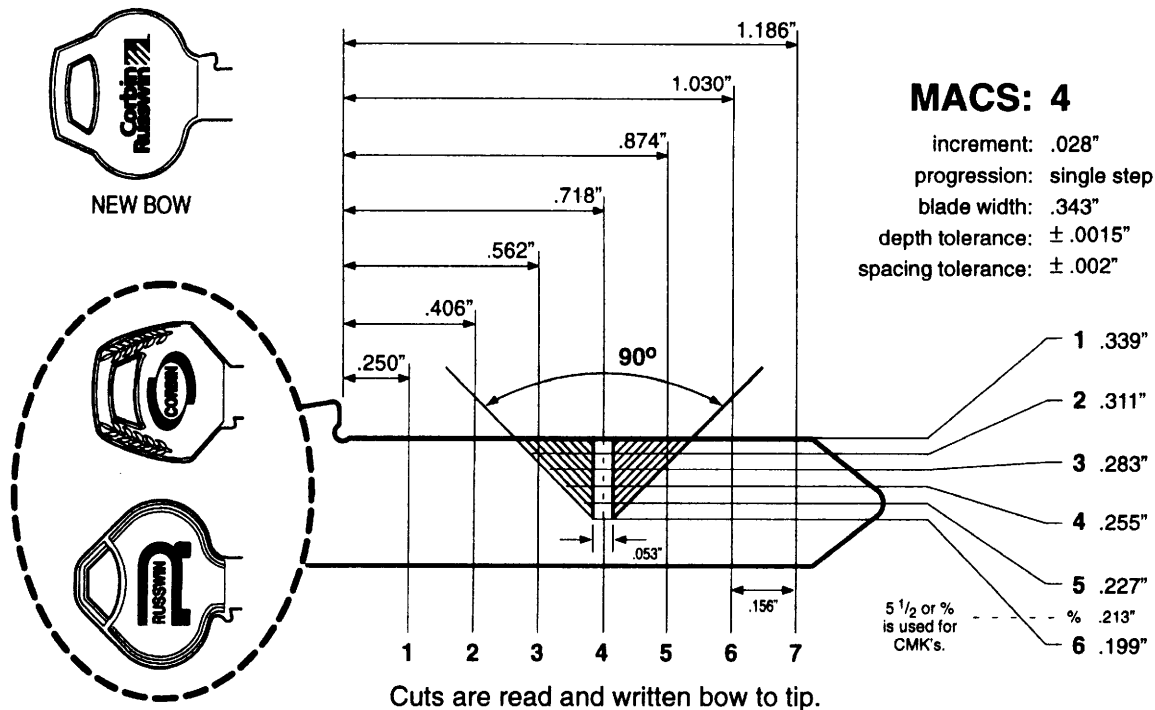
and restricted keyways not published for security reasons

Code Card
CX6A
for HPC 1200CM
Code Machine

HIGH SECURITY



AVAILABLE



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
1 .160"	-4 .051"	1 .192"	1 .028"	1 .203"	-4 .030"
2 .189"	-3 .080"	2 .163"	2 .056"	2 .231"	-3 .058"
3 .217"	-2 .107"	3 .135"	3 .084"	3 .260"	-2 .087"
4 .245"	-1 .135"	4 .107"	4 .112"	4 .288"	-1 .114"
5 .273"	0 .163"	5 .080"	5 .140"	5 .316"	0 .142"
6 .301"	+1 .192"	6 .080"		6 .344"	+1 .171"
	+2 .218"				+2 .198"
	+3 .247"				+3 .226"
	+4 .275"				+4 .253"
	+5 .303"				+5 .282"

For non-control chambers use .247"

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

Appendix A — Key Bitting Specs and Pin Lengths

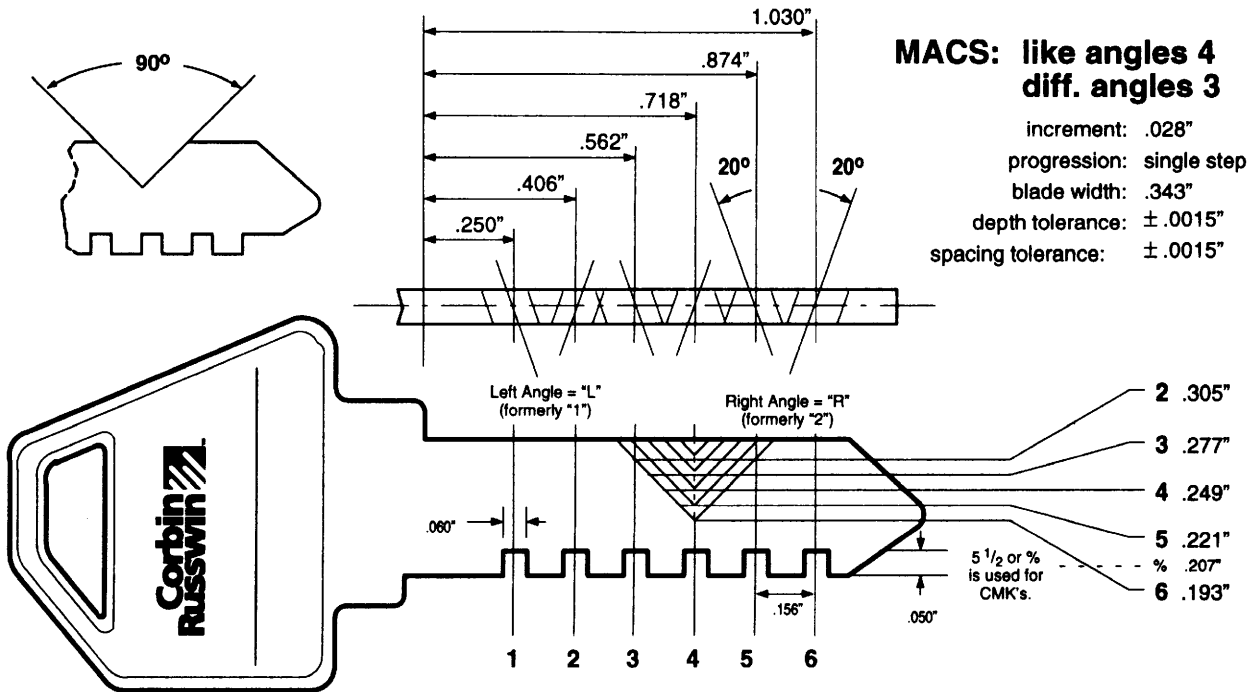
High Security - Z and DH Class, System 70 Only

Applies to these keyways:

60 59A1 59B1 59C1 59D1 D1 thru D4
70 59A2 59B2 59C2 59D2 H1 thru H8
L1 thru L4

and restricted keyways not published for security reasons

HPC Code Card
(C)X1
with cutter CW1013



Cuts are read and written bow to tip.

Suffix angle to depth: 2L 3L 4R 6L 3R 2R

Originally written either as 2₁3₁4₂6₁3₂2₂ or 2(1) 3(1) 4(2) 6(1) 3(2) 2(2).

High Security Pins

The last 3 digits of the part number are the pin length, in thousandths of an inch, including the tab:

Bottom Pins

New	Old	Order Pin #
2L	2 ₁	407T41-4242
2R	2 ₂	407T42-4242
3L	3 ₁	407T41-4270
3R	3 ₂	407T42-4270
4L	4 ₁	407T41-4298
4R	4 ₂	407T42-4298
5L	5 ₁	407T41-4326
5R	5 ₂	407T42-4326
6L	6 ₁	407T41-4354
6R	6 ₂	407T42-4354

Master Pins

New	Old	Order Pin #
2L	2 ₁	407T31-4097
2R	2 ₂	407T32-4097
2S	2 ₃	407T33-4097
3L	3 ₁	407T31-4125
3R	3 ₂	407T32-4125
3S	3 ₃	407T33-4125
4L	4 ₁	407T31-4153
4R	4 ₂	407T32-4153
4S	4 ₃	407T33-4153

Top

Size	Order Pin #
1	407T43-4193
2	407T43-4158

Springs

Type	Number
Control Chambers	172F21-7
All Others	603F20-7

Conventional Pins (1993 Consolidation)

For control chambers of high security IC and 6th chamber of Blockout and Brink function:

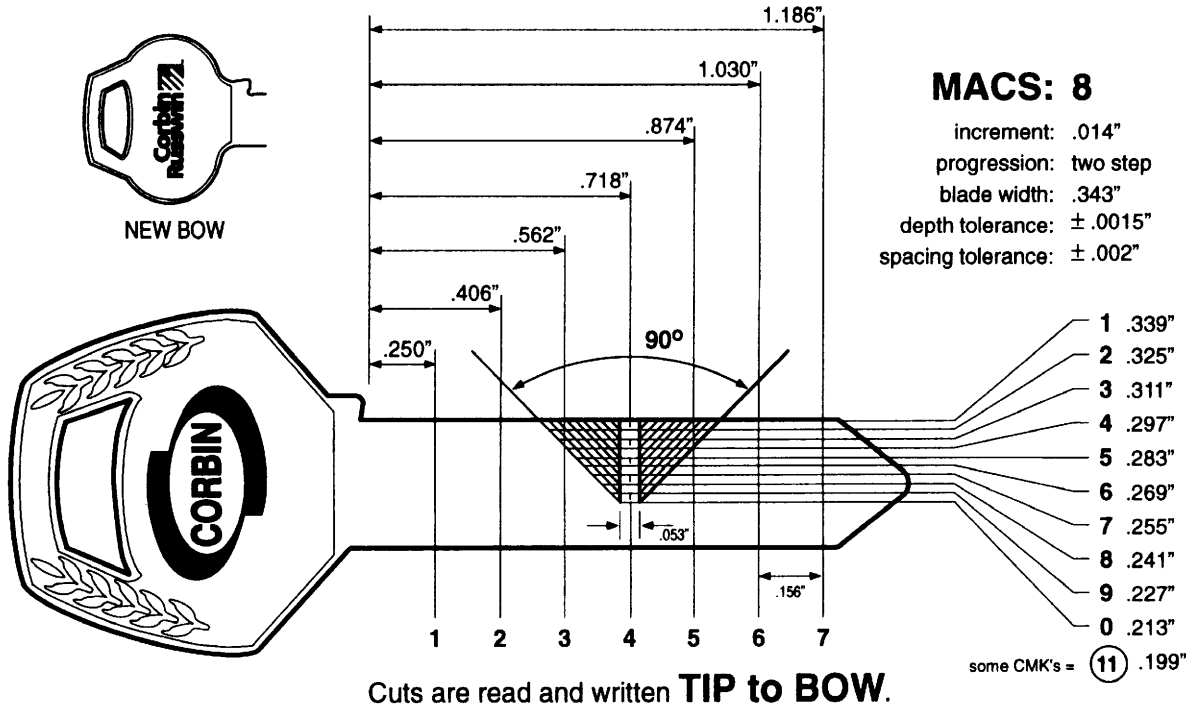
Bottom Pins	Buld-Up Pins	Master Pins	IC Top Pins
2 .231"	-4 .030"	1 .028"	2 .198"
3 .260"	-3 .058"	2 .056"	3 .171"
4 .288"	-2 .087"	3 .084"	4 .142"
5 .316"	-1 .114"	4 .112"	5 .114"
6 .344"	0 .142"		6 .087"
	+1 .171"		
	+2 .198"		
	+3 .226"		
	+4 .253"		

Top pin for 6th chamber of Blockout and Brink function cylinders: .171"

Appendix A — Key Bitting Specs and Pin Lengths

Corbin Z Class - Pre-System 70

Applies to these keyways:	60	59A1	59B1	59C1	59D1	L1 thru L4	and restricted keyways not published for security reasons	Code Card
	70	59A2	59B2	59C2	59D2			C14



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
1 .160"	-9 .037"	1 .192"	2 .028"	1 .203"	-8 .030"
2 .175"	-8 .051"	2 .177"	3 .042"	2 .217"	-7 .045"
3 .189"	-7 .066"	3 .163"	4 .056"	3 .231"	-6 .058"
4 .203"	-6 .080"	4 .149"	5 .070"	4 .245"	-5 .072"
5 .217"	-5 .093"	5 .135"	6 .084"	5 .260"	-4 .087"
6 .231"	-4 .107"	6 .120"	7 .098"	6 .273"	-3 .100"
7 .245"	-3 .120"	7 .107"	8 .112"	7 .288"	-2 .114"
8 .260"	-2 .135"	8 .093"	9 .126"	8 .301"	-1 .128"
9 .273"	-1 .149"	9 .080"		9 .316"	0 .142"
0 .288"	0 .163"	0 .066"		0 .330"	+1 .156"
	+1 .177"				+2 .171"
	+2 .192"				+3 .184"
	+3 .205"				+4 .198"
	+4 .218"				+5 .212"
	+5 .232"				+6 .226"
	+6 .247"				+7 .241"
	+7 .261"				+8 .253"
	+8 .275"				+9 .268"
	+9 .289"				

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

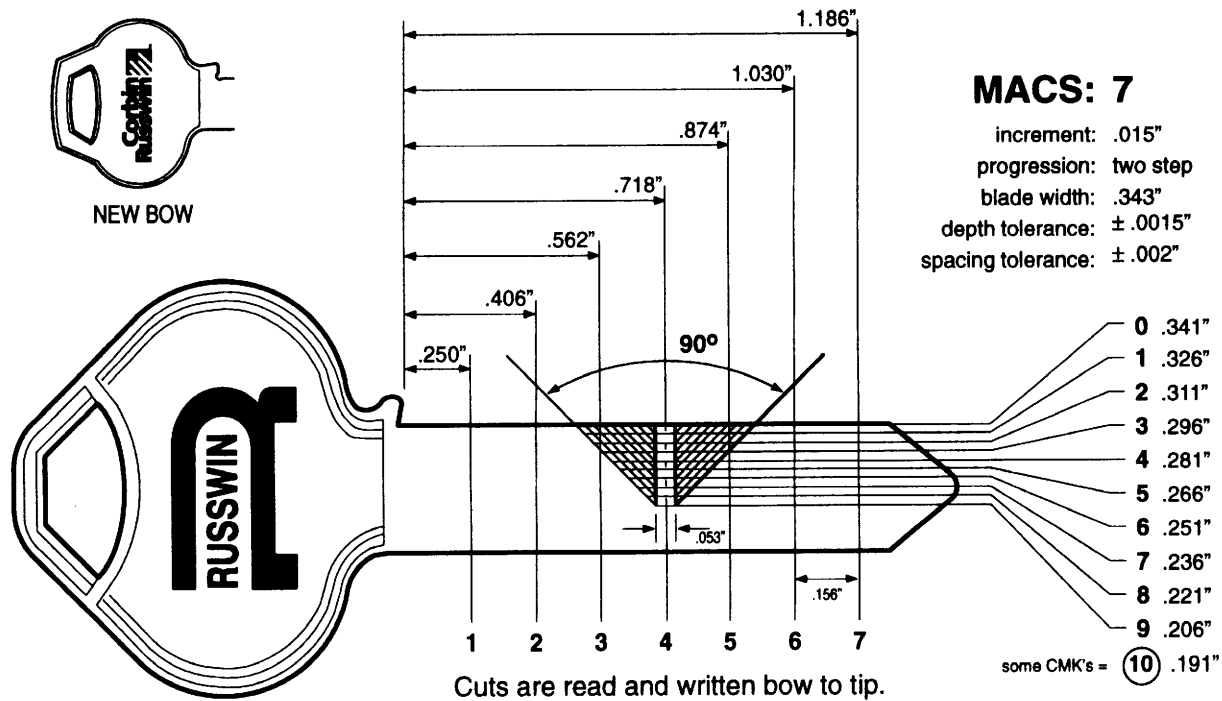
For non-control chambers use .247"

Appendix A — Key Bitting Specs and Pin Lengths

Russwin DH Class - Pre-System 70

Applies to these keyways: D1 thru D4 and restricted keyways not published for security reasons
H1 thru H8

Code Card
C42
For HPC 1200CM
Code Machine



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins	Master Pins	Bottom Pins	Build-Up Pins
0 .160"	-9 .028"	0 .192"	2 .030"	0 .203"	-7 .037"
1 .175"	-8 .042"	1 .177"	3 .045"	1 .217"	-6 .051"
2 .189"	-7 .058"	2 .163"	4 .060"	2 .231"	-5 .066"
3 .203"	-6 .072"	3 .149"	5 .075"	3 .248"	-4 .082"
4 .220"	-5 .087"	4 .133"	6 .090"	4 .263"	-3 .098"
5 .234"	-4 .103"	5 .118"	7 .105"	5 .276"	-2 .112"
6 .248"	-3 .118"	6 .103"	8 .120"	6 .291"	-1 .126"
7 .263"	-2 .133"	7 .087"	9 .135"	7 .307"	0 .142"
8 .279"	-1 .149"	8 .072"		8 .322"	+1 .156"
9 .294"	0 .163"	9 .058"		9 .337"	+2 .171"
	+1 .177"				+3 .187"
	+2 .192"				+4 .202"
	+3 .208"				+5 .218"
	+4 .222"				+6 .232"
	+5 .238"				+7 .247"
	+6 .253"				+8 .261"
	+7 .268"				+9 .277"
	+8 .282"				
	+9 .298"				

For non-control chambers use .247"

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

Appendix A — Key Bitting Specs and Pin Lengths

Corbin X Class - System 70

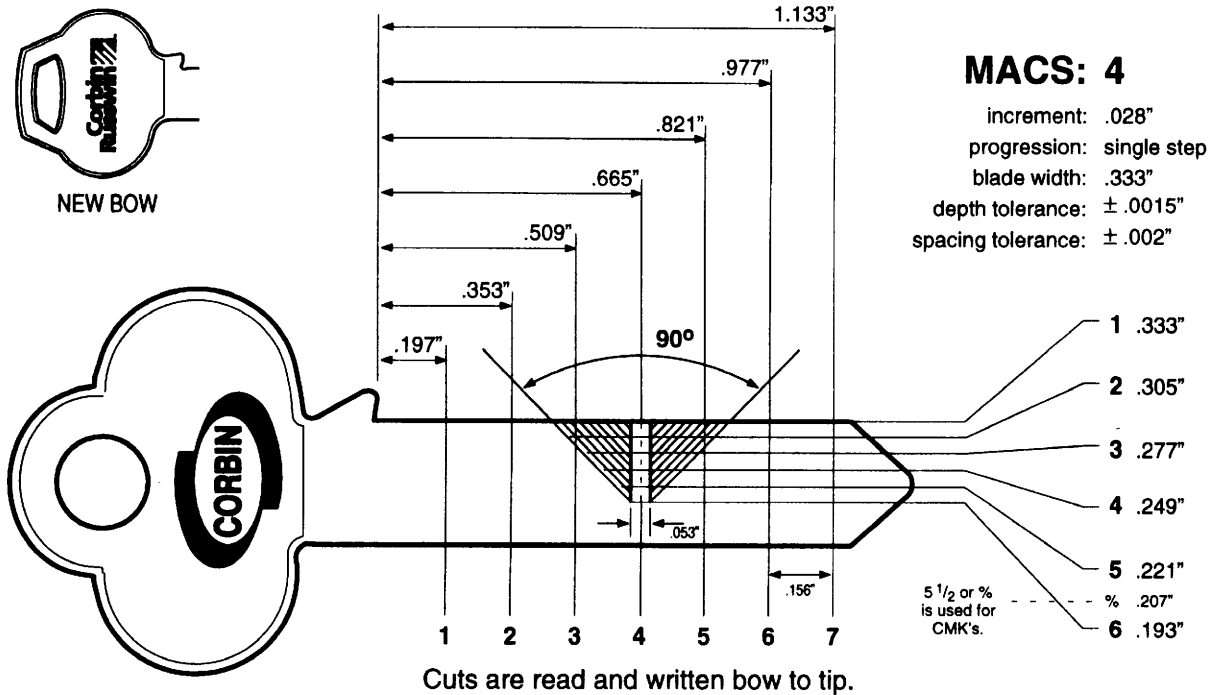
Applies to these keyways: 27 Series 67 Series 97 AR BR 57 Series 77 Series 99 BL

Code Card
(C)X5
for HPC 1200CM
Code Machine

HIGH SECURITY



NOT AVAILABLE



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Buld-Up Pins	IC Top Pins		Bottom Pins	Buld-Up Pins
1 .171"	-4 .051"	1 .192"	1 .028"	1 .213"	-4 .030"
2 .198"	-3 .080"	2 .163"	2 .056"	2 .241"	-3 .058"
3 .228"	-2 .107"	3 .135"	3 .084"	3 .269"	-2 .087"
4 .256"	-1 .135"	4 .107"	4 .112"	4 .297"	-1 .114"
5 .283"	0 .163"	5 .080"	5 .140"	5 .326"	0 .142"
6 .311"	+1 .192"	6 .080"		6 .354"	+1 .171"
	+2 .218"				+2 .198"
	+3 .247"				+3 .226"
	+4 .275"				+4 .253"
	+5 .303"				+5 .282"

For non-control chambers use .247"

- Standard Tumbler Spring 603F20-7
- IC Tumbler Spring 172F21-7
- Standard Top Pin .171"
- Spool Top Pin .171"
- Top Pin, PL5000 Padlock .320"
- Top Pin to Block Master Ring .320"
- 5-Pin Spring Cover, brass 217F42-2
- 6-Pin Spring Cover, brass 217F44-2
- 7-Pin Spring Cover, brass 217F43-2
- 6-Pin spring Cover, stainless 314F88-7
- 7-Pin spring Cover, stainless 585F39-7

Appendix A — Key Bitting Specs and Pin Lengths

Corbin X Class - Pre-System 70

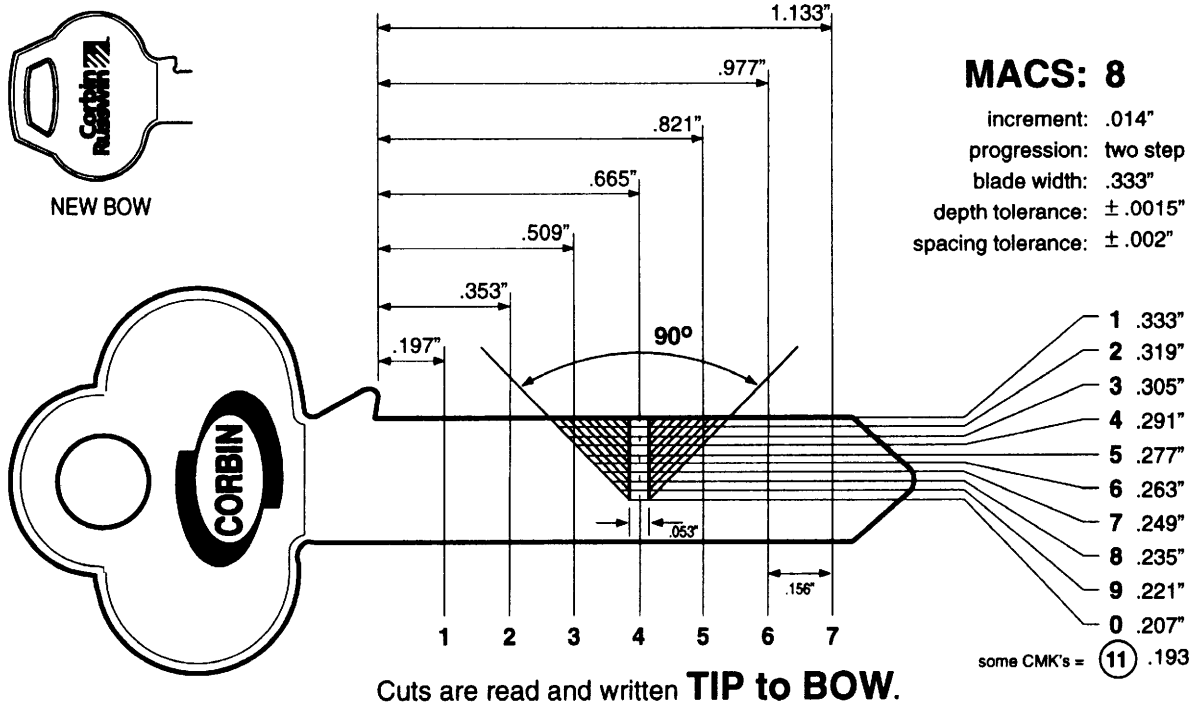
Applies to these keyways: **27 Series** **67 Series** **97** **AR** **BR**
 57 Series **77 Series** **99** **BL**

Code Card
(C)13
 for HPC 1200CM
 Code Machine

HIGH SECURITY



NOT AVAILABLE



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins	Master Pins	Bottom Pins	Build-Up Pins
1 .171"	-9 .037"	1 .192"	2 .028"	1 .213"	-8 .030"
2 .186"	-8 .051"	2 .177"	3 .042"	2 .228"	-7 .045"
3 .198"	-7 .066"	3 .163"	4 .056"	3 .241"	-6 .058"
4 .213"	-6 .080"	4 .149"	5 .070"	4 .256"	-5 .072"
5 .228"	-5 .093"	5 .135"	6 .084"	5 .269"	-4 .087"
6 .241"	-4 .107"	6 .120"	7 .098"	6 .283"	-3 .100"
7 .256"	-3 .120"	7 .107"	8 .112"	7 .297"	-2 .114"
8 .269"	-2 .135"	8 .093"	9 .126"	8 .311"	-1 .128"
9 .283"	-1 .149"	9 .080"		9 .326"	0 .142"
0 .297"	0 .163"	0 .066"		0 .340"	+1 .156"
	+1 .177"				+2 .171"
	+2 .192"				+3 .184"
	+3 .205"				+4 .198"
	+4 .218"				+5 .212"
	+5 .232"				+6 .226"
	+6 .247"				+7 .241"
	+7 .261"				+8 .253"
	+8 .275"				+9 .268"
	+9 .289"				

For non-control chambers use .247"

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

Appendix A — Key Bitting Specs and Pin Lengths

Ruswin N Class - System 70

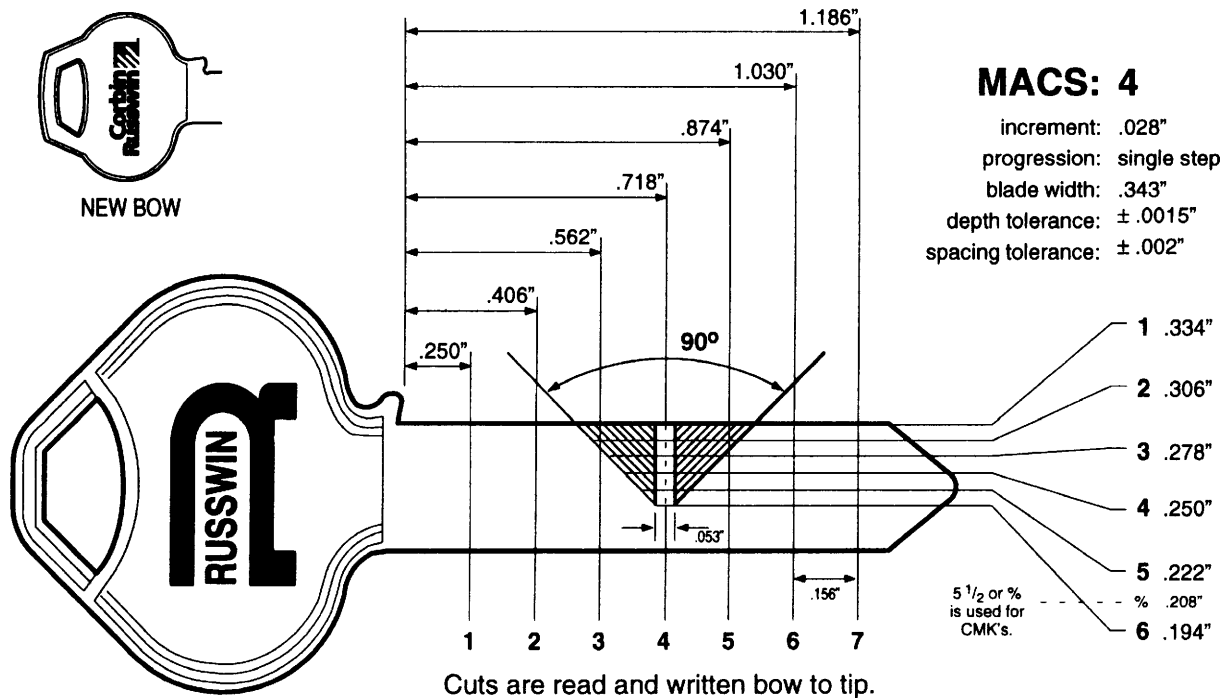
Applies only to these keyways: **N1 thru N28**
(formerly 1N thru 28N and 1K thru 28K)

Code Card
CX7 rev. A
for HPC 1200CM
Code Machine

HIGH SECURITY



NOT AVAILABLE



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
1 .165"	-4 .051"	1 .192"	1 .028"	1 .208"	-4 .030"
2 .193"	-3 .080"	2 .163"	2 .056"	2 .236"	-3 .058"
3 .220"	-2 .107"	3 .135"	3 .084"	3 .263"	-2 .087"
4 .248"	-1 .135"	4 .107"	4 .112"	4 .291"	-1 .114"
5 .276"	0 .163"	5 .080"	5 .140"	5 .320"	0 .142"
6 .305"	+1 .192"	6 .080"		6 .349"	+1 .171"
	+2 .218"				+2 .198"
	+3 .247"				+3 .226"
	+4 .275"				+4 .253"
	+5 .303"				+5 .282"

For non-control chambers use .247"

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

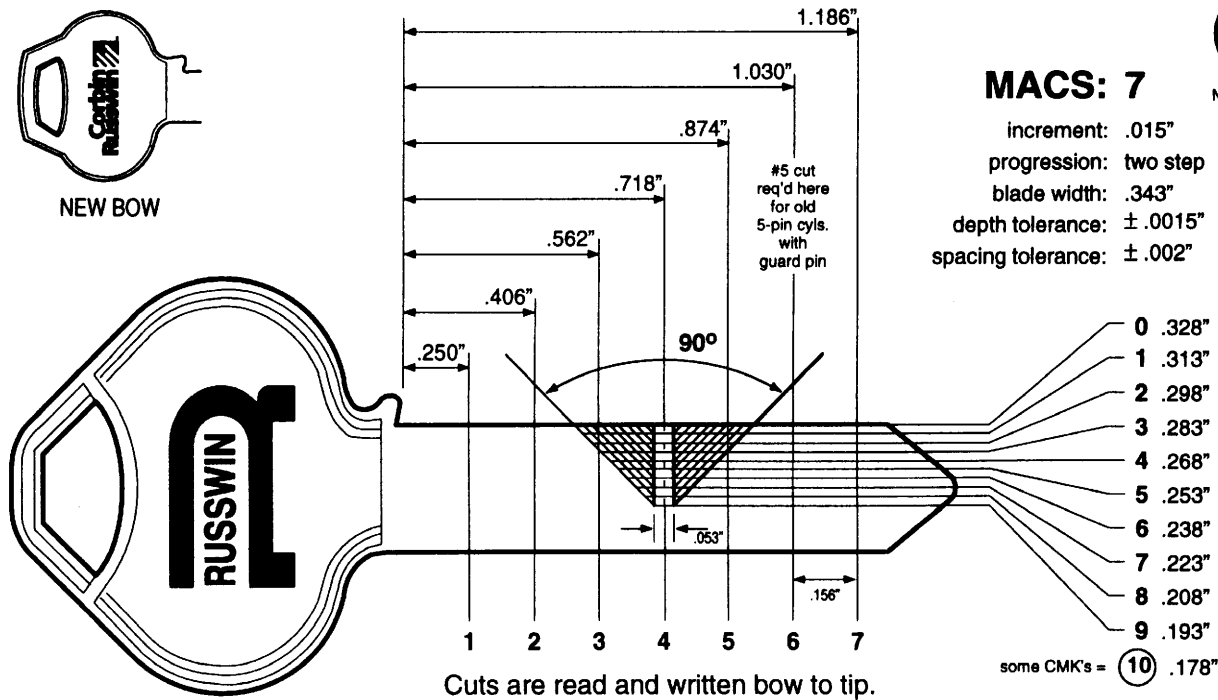
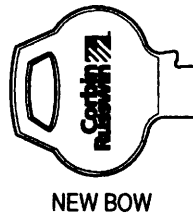
Appendix A — Key Bitting Specs and Pin Lengths

Ruswin N Class - Pre-System 70

**Applies only to these keyways: N1 thru N28
(formerly 1N thru 28N and 1K thru 28K)**

Code Card
(C)41
for HPC 1200CM
Code Machine

HIGH SECURITY



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
0 .171"	-9 .028"	0 .192"	2 .030"	0 .213"	-7 .037"
1 .186"	-8 .042"	1 .177"	3 .045"	1 .228"	-6 .051"
2 .201"	-7 .058"	2 .163"	4 .060"	2 .245"	-5 .066"
3 .217"	-6 .072"	3 .149"	5 .075"	3 .260"	-4 .082"
4 .231"	-5 .087"	4 .133"	6 .090"	4 .273"	-3 .098"
5 .245"	-4 .103"	5 .118"	7 .105"	5 .288"	-2 .112"
6 .260"	-3 .118"	6 .103"	8 .120"	6 .305"	-1 .126"
7 .276"	-2 .133"	7 .087"	9 .135"	7 .320"	0 .142"
8 .291"	-1 .149"	8 .072"		8 .334"	+1 .156"
9 .307"	0 .163"	9 .058"		9 .349"	+2 .171"
	+1 .177"				+3 .187"
	+2 .192"				+4 .202"
	+3 .208"				+5 .218"
	+4 .222"				+6 .232"
	+5 .238"				+7 .247"
	+6 .253"				+8 .261"
	+7 .268"				+9 .277"
	+8 .282"				
	+9 .298"				
		For non-control chambers use .247"	Standard Tumbler Spring 603F20-7		
			IC Tumbler Spring 172F21-7		
			Standard Top Pin .171"		
			Spool Top Pin .171"		
			Top Pin, PL5000 Padlock .320"		
			Top Pin to Block Master Ring .320"		
			5-Pin Spring Cover, brass 217F42-2		
			6-Pin Spring Cover, brass 217F44-2		
			7-Pin Spring Cover, brass 217F43-2		
			6-Pin spring Cover, stainless 314F88-7		
			7-Pin spring Cover, stainless 585F39-7		

Appendix A — Key Bitting Specs and Pin Lengths

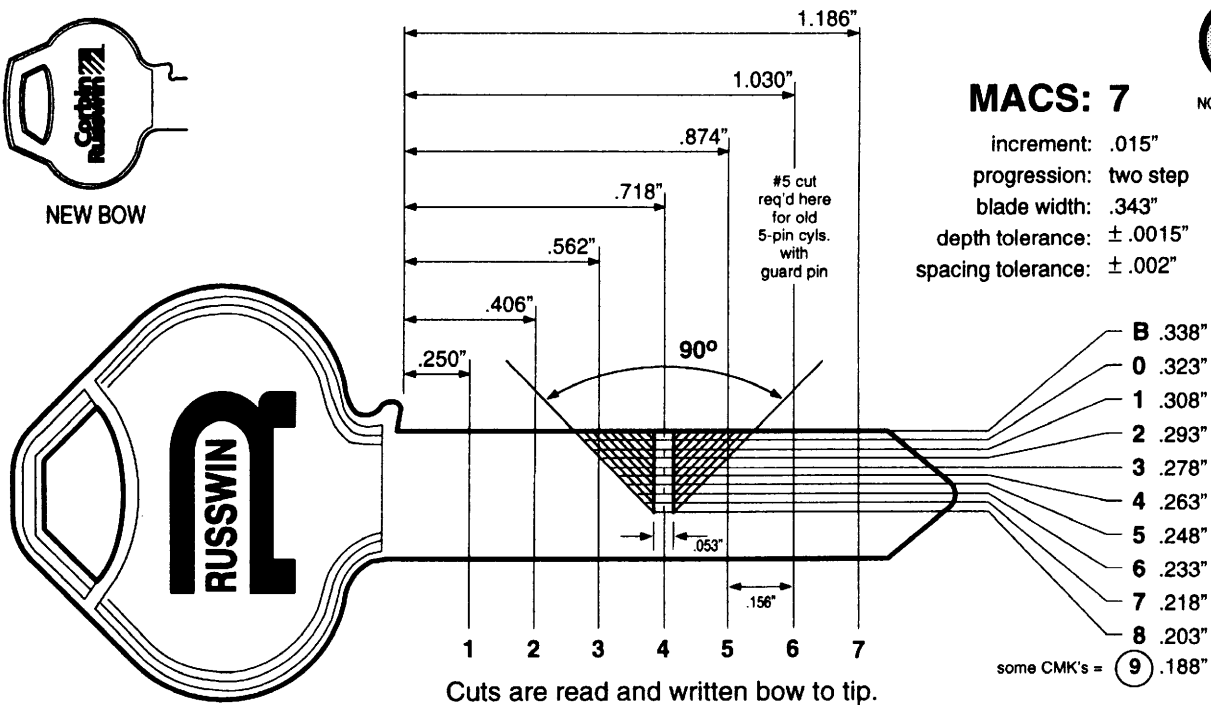
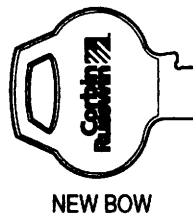
Ruswin 981 Class

Applies to these keyways:
 5-Pin: **981** (R prefix)
 6-Pin: **was 961** (V prefix)
 7-Pin: (L prefix)

982 (S prefix)
was 962 (W prefix)
 (1L prefix)

983 (T prefix)
was 963 (X prefix)
 (2L prefix)

Code Card
C981
 for HPC 1200CM
 Code Machine



MACS: 7

increment: .015"
 progression: two step
 blade width: .343"
 depth tolerance: ± .0015"
 spacing tolerance: ± .002"

- B .338"
- 0 .323"
- 1 .308"
- 2 .293"
- 3 .278"
- 4 .263"
- 5 .248"
- 6 .233"
- 7 .218"
- 8 .203"
- 9 .188"

Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Buld-Up Pins	IC Top Pins		Bottom Pins	Buld-Up Pins
B .160"	-9 .028"	B .192"	2 .030"	B .203"	-7 .037"
0 .175"	-8 .042"	0 .177"	3 .045"	0 .217"	-6 .051"
1 .189"	-7 .058"	1 .163"	4 .060"	1 .231"	-5 .066"
2 .203"	-6 .072"	2 .149"	5 .075"	2 .248"	-4 .082"
3 .220"	-5 .087"	3 .133"	6 .090"	3 .263"	-3 .098"
4 .234"	-4 .103"	4 .118"	7 .105"	4 .276"	-2 .112"
5 .248"	-3 .118"	5 .103"	8 .120"	5 .291"	-1 .126"
6 .263"	-2 .133"	6 .087"	9 .135"	6 .307"	0 .142"
7 .279"	-1 .149"	7 .072"		7 .322"	+1 .156"
8 .294"	0 .163"	8 .058"		8 .337"	+2 .171"
	+1 .177"				+3 .187"
	+2 .192"				+4 .202"
	+3 .208"				+5 .218"
	+4 .222"				+6 .232"
	+5 .238"				+7 .247"
	+6 .253"				+8 .261"
	+7 .268"				+9 .277"
	+8 .282"				
	+9 .298"				

Standard Tumbler Spring	603F20-7
IC Tumbler Spring	172F21-7
Standard Top Pin	.171"
Spool Top Pin	.171"
Top Pin, PL5000 Padlock	.320"
Top Pin to Block Master Ring	.320"
5-Pin Spring Cover, brass	217F42-2
6-Pin Spring Cover, brass	217F44-2
7-Pin Spring Cover, brass	217F43-2
6-Pin spring Cover, stainless	314F88-7
7-Pin spring Cover, stainless	585F39-7

For non-control chambers use .247"

Appendix A — Key Bitting Specs and Pin Lengths

Old Russwin 852 Class

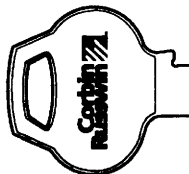
Applies only to these keyways: **852** (8 prefix)
252 (2 prefix)
G (G prefix)

Code Card
C852
 for HPC 1200CM
 Code Machine

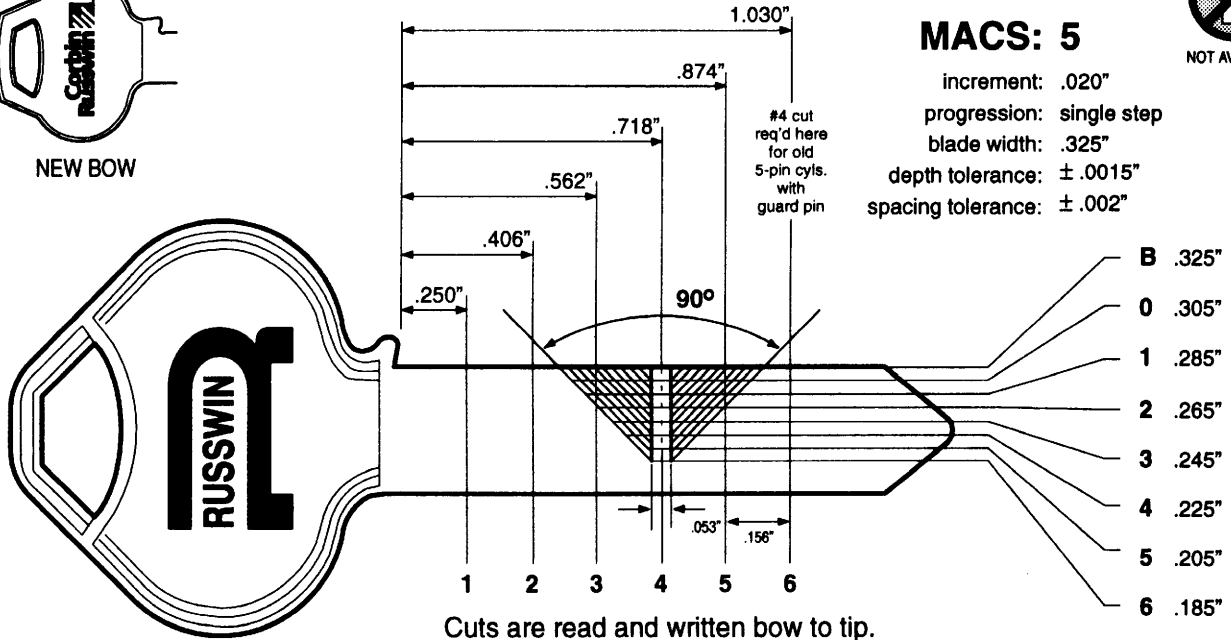
HIGH SECURITY



NOT AVAILABLE



NEW BOW



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
B .171"	-6 .042"	B .202"	2 .040"	B .217"	-5 .042"
0 .193"	-5 .063"	0 .184"	3 .060"	0 .234"	-4 .063"
1 .213"	-4 .082"	1 .163"	4 .080"	1 .256"	-3 .082"
2 .231"	-3 .103"	2 .142"	5 .100"	2 .276"	-2 .103"
3 .251"	-2 .122"	3 .122"	6 .120"	3 .294"	-1 .122"
4 .273"	-1 .142"	4 .103"	7 .140"	4 .316"	0 .142"
5 .291"	0 .163"	5 .082"		5 .334"	+1 .163"
6 .311"	+1 .184"	6 .063"		6 .354"	+2 .184"
	+2 .202"				+3 .202"
	+3 .222"				+4 .222"
	+4 .241"				+5 .241"
	+5 .261"				+6 .261"
	+6 .282"				

For non-control chambers use .247"

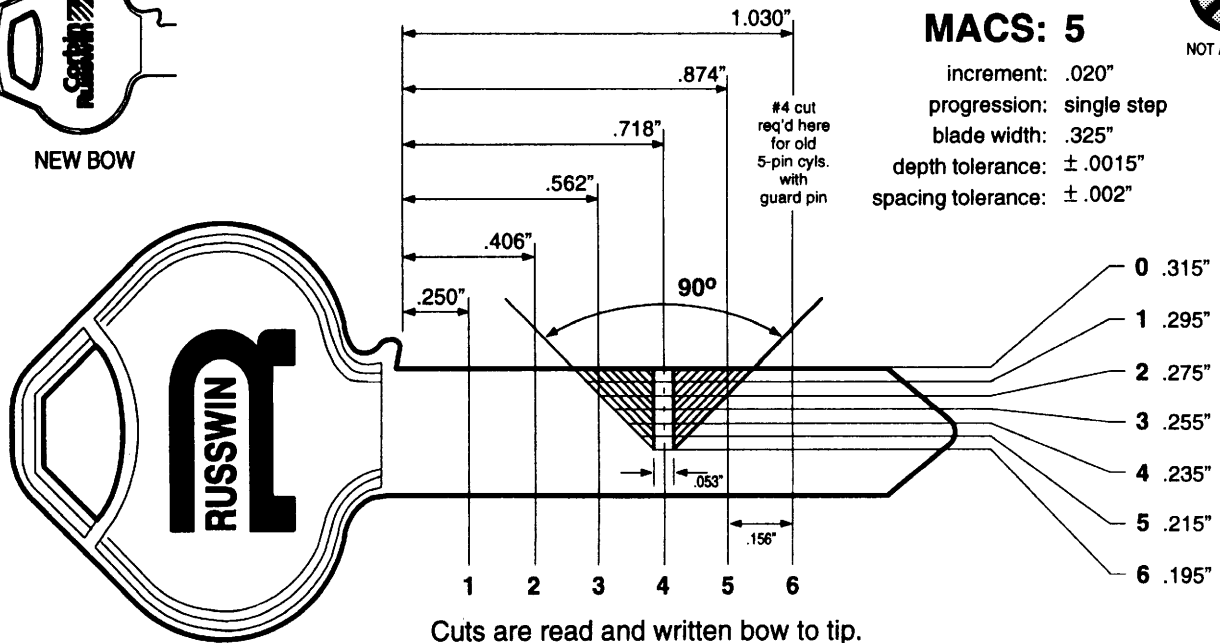
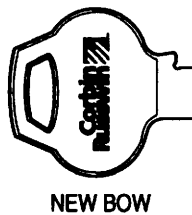
- Standard Tumbler Spring 603F20-7
- IC Tumbler Spring 172F21-7
- Standard Top Pin .171"
- Spool Top Pin .171"
- Top Pin, PL5000 Padlock .320"
- Top Pin to Block Master Ring .320"
- 5-Pin Spring Cover, brass 217F42-2
- 6-Pin Spring Cover, brass 217F44-2
- 7-Pin Spring Cover, brass 217F43-2
- 6-Pin spring Cover, stainless 314F88-7
- 7-Pin spring Cover, stainless 585F39-7

Appendix A — Key Bitting Specs and Pin Lengths

Old Russwin A Class

Applies only to these keyways: **A1 thru A24**
(formerly 1A thru 24A and 1Z thru 24Z)

Alter Depth Marks
on Code Card
X12
for HPC Code Machine



Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
0 .177"	-6 .042"	0 .184"	2 .040"	0 .220"	-5 .042"
1 .198"	-5 .063"	1 .163"	3 .060"	1 .241"	-4 .063"
2 .217"	-4 .082"	2 .142"	4 .080"	2 .260"	-3 .082"
3 .236"	-3 .103"	3 .122"	5 .100"	3 .279"	-2 .103"
4 .256"	-2 .122"	4 .103"	6 .120"	4 .301"	-1 .122"
5 .276"	-1 .142"	5 .082"		5 .320"	0 .142"
6 .297"	0 .163"	6 .063"		6 .340"	+1 .163"
	+1 .184"				+2 .184"
	+2 .202"				+3 .202"
	+3 .222"				+4 .222"
	+4 .241"				+5 .241"
	+5 .261"				+6 .261"
	+6 .282"				
		For non-control chambers use .247"	Standard Tumbler Spring 603F20-7		
			IC Tumbler Spring 172F21-7		
			Standard Top Pin .171"		
			Spool Top Pin .171"		
			Top Pin, PL5000 Padlock .320"		
			Top Pin to Block Master Ring .320"		
			5-Pin Spring Cover, brass 217F42-2		
			6-Pin Spring Cover, brass 217F44-2		
			7-Pin Spring Cover, brass 217F43-2		
			6-Pin spring Cover, stainless 314F88-7		
			7-Pin spring Cover, stainless 585F39-7		

Appendix A — Key Bitting Specs and Pin Lengths

Old Russwin 752

Applies only to 752 keyway; 5-pin "7" prefix

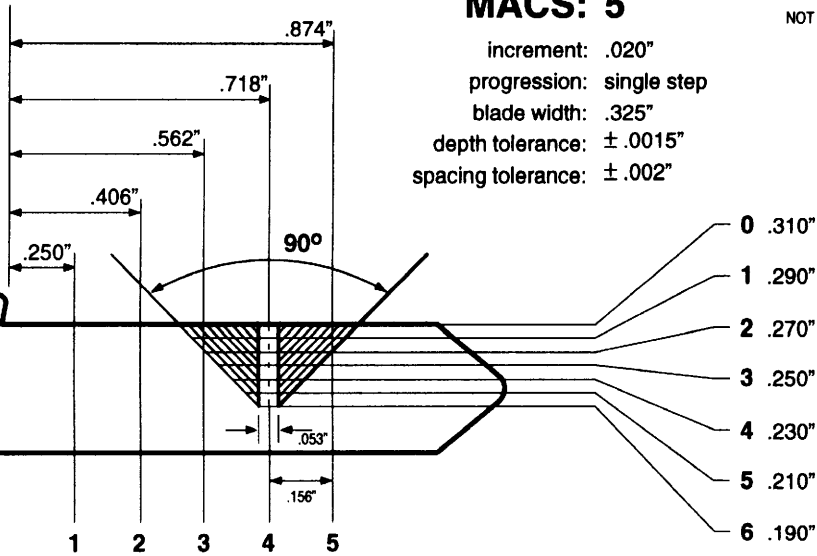
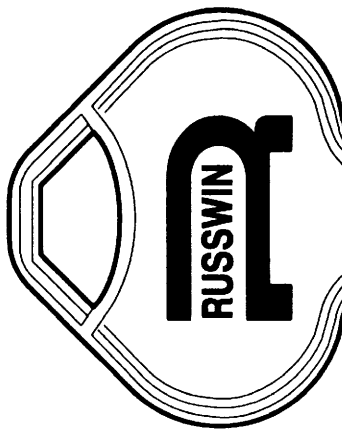
For old 751 keyway (H prefix) rim cylinders, spacing is .245"/.156" and cuts are .001" deeper.

Code Card
X13
for HPC 1200CM
Code Machine

HIGH SECURITY



NOT AVAILABLE



Cuts are read and written bow to tip.

Pin Lengths (1993 Consolidation)

.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build-Up Pins	IC Top Pins		Bottom Pins	Build-Up Pins
0 .186"	-6 .042"	0 .184"	2 .040"	0 .231"	-5 .042"
1 .208"	-5 .063"	1 .163"	3 .060"	1 .251"	-4 .063"
2 .228"	-4 .082"	2 .142"	4 .080"	2 .269"	-3 .082"
3 .248"	-3 .103"	3 .122"	5 .100"	3 .291"	-2 .103"
4 .267"	-2 .122"	4 .103"	6 .120"	4 .311"	-1 .122"
5 .288"	-1 .142"	5 .082"		5 .330"	0 .142"
6 .307"	0 .163"	6 .063"		6 .349"	+1 .163"
	+1 .184"				+2 .184"
	+2 .202"				+3 .202"
	+3 .222"				+4 .222"
	+4 .241"				+5 .241"
	+5 .261"				+6 .261"
	+6 .282"				

For non-control chambers use .247"

- Standard Tumbler Spring 603F20-7
- IC Tumbler Spring 172F21-7
- Standard Top Pin .171"
- Spool Top Pin .171"
- Top Pin, PL5000 Padlock .320"
- Top Pin to Block Master Ring .320"
- 5-Pin Spring Cover, brass 217F42-2
- 6-Pin Spring Cover, brass 217F44-2
- 7-Pin Spring Cover, brass 217F43-2
- 6-Pin spring Cover, stainless 314F88-7
- 7-Pin spring Cover, stainless 585F39-7

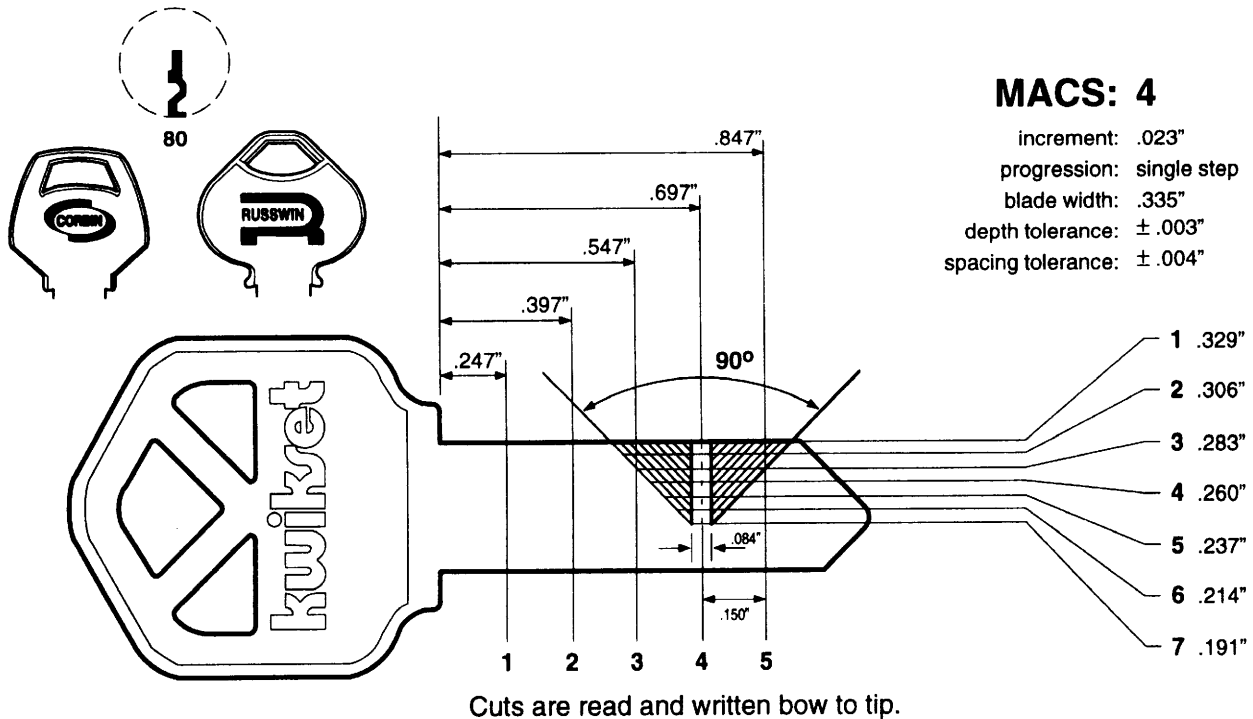
Appendix A — Key Bitting Specs and Pin Lengths

K Class

Applies only to these keyways: **Kwikset 1063**
Corbin 80
Russwin 751

Discontinued. Use Ilco 1001GH
 Discontinued. Use Ilco 1011GH

Code Card
31
 with Cutter
 CW1014



Contact your local Kwikset distributor for these items.

Bottom Pins		Master Pins		Top Pins	
Size/Length	Part No.	Size/Length	Part No.	Length	Part No.
1 .172"	01-03100	1 .023"	01-03108	Reg. .180"	01-01858
2 .195"	01-03101	2 .046"	01-03110	Const. .160"	01-03117
3 .218"	01-03103	3 .069"	01-03112		
4 .241"	01-03105	4 .092"	01-03113		
5 .264"	01-03106	5 .115"	01-03114		
6 .287"	01-03107	6 .138"	01-03125		

Other Cylinder Parts and Service Equipment

Description	Part No.	Description	Part No.
Spring	01-01777	Follower	21-00152
Spring Cover	01-05757	Key Gauge	21-00049
Construction Balls	01-02208	Cylinder Removal Tool	01-01467
Plug Retainer	01-04345		

This key class was used in Corbin and Russwin residential locks between 1966 and 1992. Kwikset had an older depth system that used a .031" increment. That system was never used by Corbin Russwin, but in the interest of completeness, the depths are included here: 1 = .328", 3 = .297", 5 = .266", 7 = .235".

Appendix A — Key Bitting Specs and Pin Lengths

The specifications on this page are for Corbin and Russwin's first pin tumbler keyways.

The factory no longer supports these cylinders or keys, but they still are serviced in older cities throughout America.

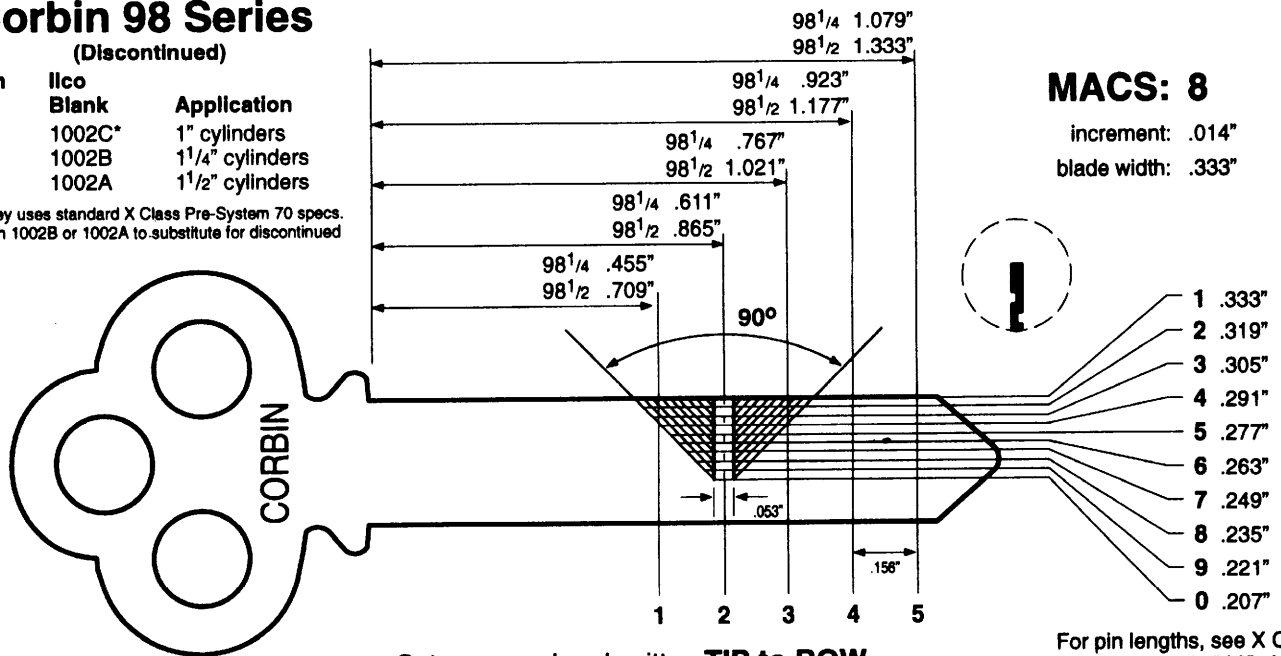
As of the date of this publication, exhaustive research by the author has failed to locate engineering drawings to confirm the Corbin 98 Series specifications.

The spacing printed here is empirical data; measurements taken from old cylinders. The depths and pin lengths, however, are fairly certain.

Corbin 98 Series (Discontinued)

Corbin Blank	Iico Blank	Application
98	1002C*	1" cylinders
98 ^{1/4}	1002B	1 ^{1/4} " cylinders
98 ^{1/2}	1002A	1 ^{1/2} " cylinders

*Short key uses standard X Class Pre-System 70 specs. Cut down 1002B or 1002A to substitute for discontinued 1002C.



MACS: 8
 increment: .014\"/>
 blade width: .333\"

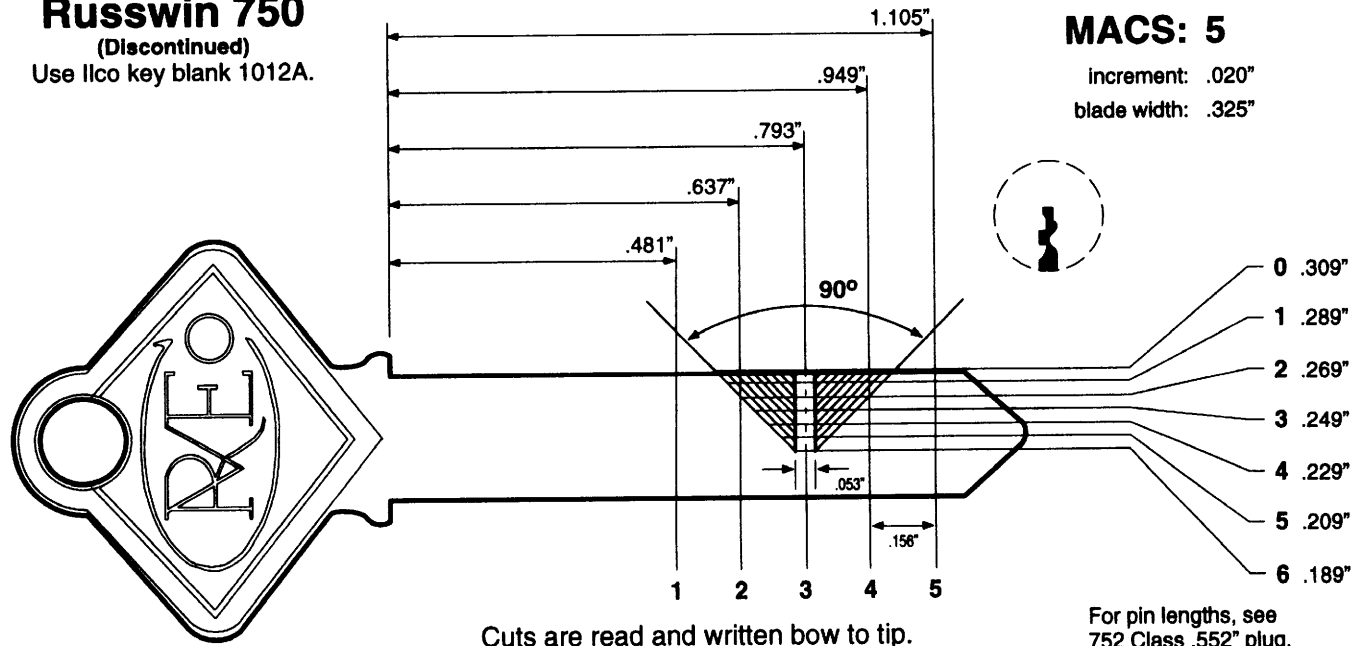
- 1 .333"
- 2 .319"
- 3 .305"
- 4 .291"
- 5 .277"
- 6 .263"
- 7 .249"
- 8 .235"
- 9 .221"
- 0 .207"

Cuts are read and written **TIP to BOW**.

For pin lengths, see X Class Pre-System 70 .509" plug.

Russwin 750 (Discontinued)

Use Iico key blank 1012A.



MACS: 5
 increment: .020\"/>
 blade width: .325\"

- 0 .309"
- 1 .289"
- 2 .269"
- 3 .249"
- 4 .229"
- 5 .209"
- 6 .189"

Cuts are read and written bow to tip.

For pin lengths, see 752 Class .552" plug.

Appendix A — Key Bitting Specs and Pin Lengths

S Class Small Pin

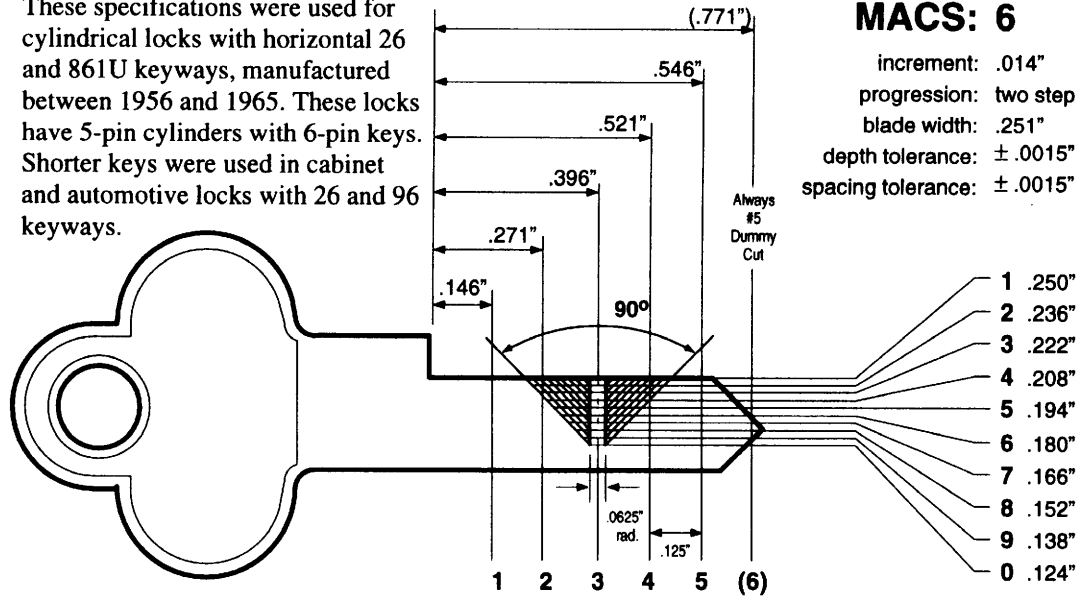
Applies only to these keyways: **Corbin 26**
Corbin 96
Russwin 861UB

Discontinued. Use Ilco X1001KC or X1000KC
 Discontinued. Use Ilco 1000K
 Discontinued. Use Ilco X1011KR

Code Card
X46 or X48
 for HPC 1200CM
 Code Machine



These specifications were used for cylindrical locks with horizontal 26 and 861U keyways, manufactured between 1956 and 1965. These locks have 5-pin cylinders with 6-pin keys. Shorter keys were used in cabinet and automotive locks with 26 and 96 keyways.



MACS: 6

increment: .014"
 progression: two step
 blade width: .251"
 depth tolerance: ± .0015"
 spacing tolerance: ± .0015"

Cuts are read and written **TIP to BOW**.

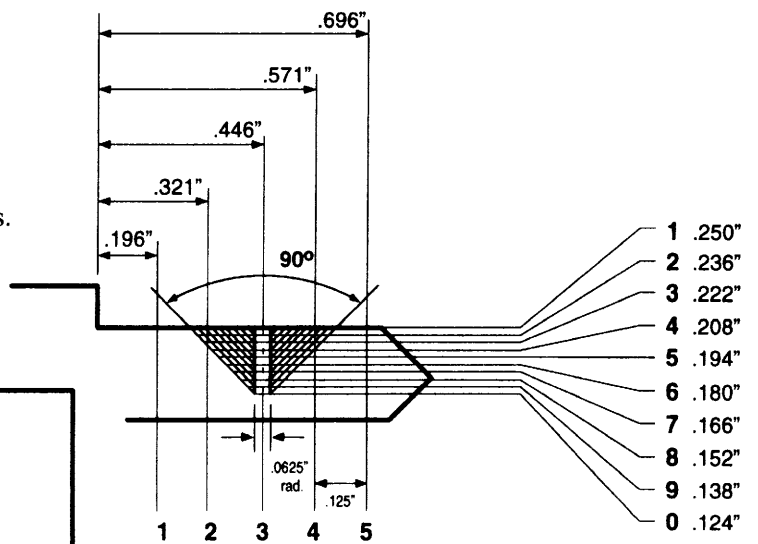


Other Spacing for Corbin 26 and 96 (Depths same as above)



This spacing applies to rim cylinders as well as various cabinet and automotive locks.

Note: Drawings for 96 keyway products call for spacing to begin at .197" on keys but .201" in cylinders!



Code Information (TIP to BOW!)

Prefix	Keyway	Spacing	Remarks
1D	96	.197"	direct; small rim cylinders
1N	26	.146"	direct and blind
7D	96	.146"	direct
8D	96	.197"	direct
9D	26	.196"	direct; small rim cylinders
CR	26	.146"	blind; 3 cuts on 4-pin blank
DB	26	.146"	blind for Diebold
E	96	.197"	blind 4-pin
F	96	.146"	blind for Franklin auto
GE	96	.146"	GE75 = 7364
HH	96	.146"	HH21 - HH31 blind
HH	26	.146"	HH41 - HH61 blind
K	96	.146"	K250 = 535x for Kardex files
MD	26	.146"	blind
MJ	26	.146"	blind
N	26	.146"	blind
P	96	?	P295 = 7421 for Postindex
SL	26	.196"	blind
WDA	26	.146"	blind WDA1 = 25367

Pin Information

.095" Diameter Pins and .397" Diameter Plug

Bottom Pins		Master Pins		Top Pins	
1	.144"	2	.028"	1	.198"
2	.158"	3	.042"	2	.184"
3	.172"	4	.056"	3	.170"
4	.186"	5	.070"	4	.156"
5	.200"	6	.084"	5	.142"
6	.214"	7	.098"	6	.128"
7	.228"	8	.112"	7	.114"
8	.242"	9	.126"	8	.100"
9	.256"			9	.086"
0	.270"			0	.072"

Appendix A — Key Bitting Specs and Pin Lengths

Old Russwin Small Pin

The factory no longer supports these cylinders or keys, but they still are serviced in the field.

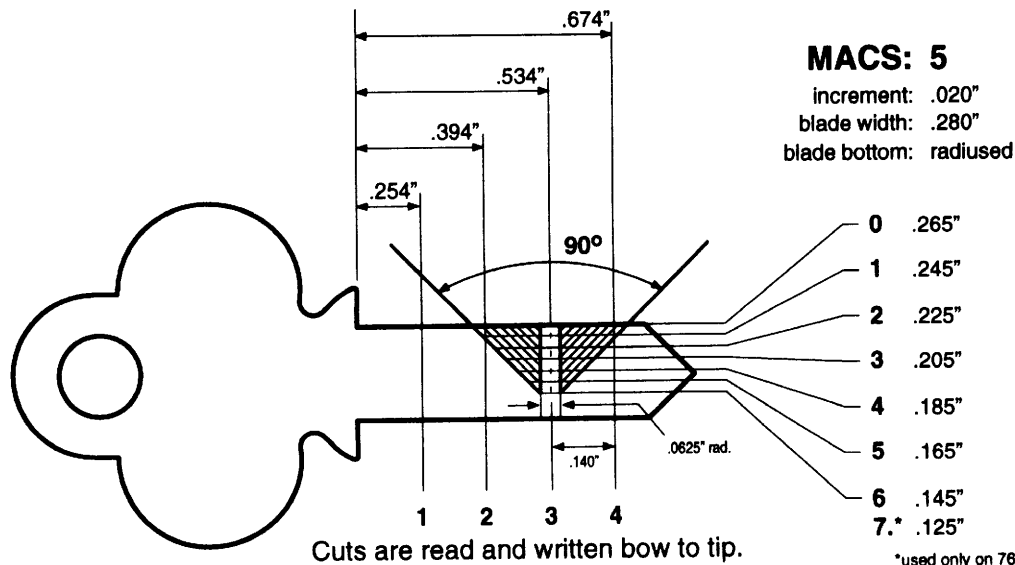
The dimensions printed here are interpreted from early engineering drawings and actual measurements taken from old keys.

Because factory key depths were located from a register groove, root depths of sample keys may be up to .005" deeper than these specs. Cut the key to these depths and touch up by hand if needed.

For Small Rim Cylinders

Applies only to these keyways: **861B** (Not 861U) 9 Prefix Discontinued. Use Iico 1011B
761B P or no prefix Discontinued. Use Iico 1012DM

Bitting stamped on tailpiece and original keys.



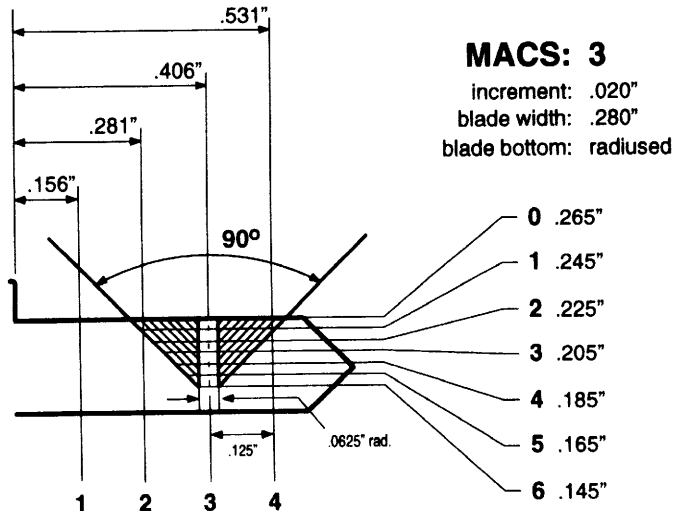
For 1920's Automotive Cylinders

Applies only to: **Russwin 900B**, Iico 1011B X or 1011C, all discontinued
 E1 - 250 blind codes for Hudson, Essex and Nash (see Reed General Code Book)
 "5" prefix direct bitting for miscellaneous and retrofit locks

After Spacing
 Marks on
 Code Card
X50



Some other automotive cylinders use spacing of .156" / .140" on a longer blank. No additional information is available at press time.



Pin Information

.095" Diameter Pins and .397" Diameter Plug

Bottom Pins	Master Pins	Top Pins
0		0 .070"
1		1 .198"
2	2 .040"	2 .184"
3	3 .060"	3 .170"
4	4 .080"	4 .156"
5	5 .100"	5 .142"
6	6 .120"	6 .126"

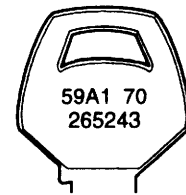
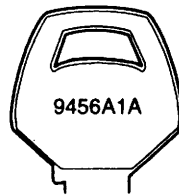
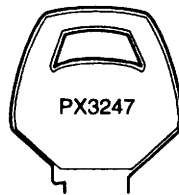
Appendix B — Key Prefixes and Suffixes

Corbin Listing by Prefix / Suffix

Corbin cut keys normally have some sort of number (other than a key symbol) which helps to identify their key section and how they may fit into a keying system.

Master level keys may have a prefix or suffix. In either case, the accompanying digits form a blind code, or register number, which has no relationship to the bitting.

Since mid-1992, only master level keys retain blind prefixes and suffixes. All other keys use the actual key section as a prefix.



A key marked “6A1 238972” is identified as 59A1 key section, it is a change key in a system of at least 3 levels of keying, and it is Pre-System 70. System 70 keys had “70” between the prefix and the bitting, e.g. 6A1-70 265243.

This simplifies normal key identification, while preserving a degree of security for master keys. The current stamping of the older examples above would be 59A1 238972 and 59A1-70 265243, respectively.

Prefix	Section	Pins	Type	Remarks
0	97	5	stock	blind codes 0200.000 & up
0	97	5, 6, 7	GMK	prefix is 0, e.g. 0710
1D	98	5	CK	obsolete; first cut at .197”
1D1	Restricted	6	CK	
1DA	Restricted	6	MK	Not Under GMK
1H	27B1	7	CK	
1J	27B1	6	CK	
1K	27B1	5	CK	
1W	27B1	5, 6, 7	MK	Under GMK
2A	Contact CCL Security Products in New Britain, CT.			
2A1	Restricted	5, 6, 7	CK	Under GMK
2A2	Restricted	5, 6, 7	CK	Under GMK
2AA	Restricted	5, 6, 7	MK	Under GMK
2AB	Restricted	5, 6, 7	MK	Under GMK
2B1	Restricted	5, 6, 7	CK	Under GMK
2B2	Restricted	5, 6, 7	CK	Under GMK
2BA	Restricted	5, 6, 7	MK	Under GMK
2BB	Restricted	5, 6, 7	MK	Under GMK
2C	26	5	CK	Under GMK, obsolete
2C1	Restricted	5, 6, 7	CK	Under GMK
2C2	Restricted	5, 6, 7	CK	Under GMK
2CA	Restricted	5, 6, 7	MK	Under GMK
2CB	Restricted	5, 6, 7	MK	Under GMK
2D	BR	5	CK	
2D1	Restricted	5, 6, 7	CK	Under GMK
2D2	Restricted	5, 6, 7	CK	Under GMK
2DA	Restricted	5, 6, 7	MK	Under GMK
2DB	Restricted	5, 6, 7	MK	Under GMK
2E	67	5, 6	MK	Under GMK
2F	77A2	5, 6, 7	MK	Under GMK
2H	99	6	CK	
2J	99	6	CK	
2K	99	5	CK	
2L	67	5	CK	
2M	26	5	MK	Under GMK, obsolete
2MA	Restricted	5, 6, 7	MK	
2MB	Restricted	5, 6, 7	MK	
2MC	Restricted	5, 6, 7	MK	
2MD	Restricted	5, 6, 7	MK	
2N	77A2	5	CK	
2P	77A2	6	CK	
2S	67	6	CK	
2T	67	6 long	CK	6 1/2 pin hotel key
2U	L2	5, 6	MK	Under GMK
2V	77A2	7	CK	
2W	97	5, 6	MK or CK	Under GMK
2Z	70	5, 6, 7	MK	Under GMK
3A1	57A1	5, 6, 7	CK	

Prefix	Section	Pins	Type	Remarks
3A2	57A2	5, 6, 7	CK	
3AA	57A1	5, 6, 7	MK	
3AB	57A2	5, 6, 7	MK	
3B1	57B1	5, 6, 7	CK	
3B2	57B2	5, 6, 7	CK	
3BA	57B1	5, 6, 7	MK	
3BB	57B2	5, 6, 7	MK	
3C1	57C1	5, 6, 7	CK	
3C2	57C2	5, 6, 7	CK	
3CA	57C1	5, 6, 7	MK	
3CB	57C2	5, 6, 7	MK	
3D1	57D1	5, 6, 7	CK	
3D2	57D2	5, 6, 7	CK	
3DA	57D1	5, 6, 7	MK	
3DB	57D2	5, 6, 7	MK	
3E	68	5, 6	MK	Under GMK
3F	77B1	5, 6, 7	MK	Under GMK
3H	27	6 long	CK	6 1/2 pin hotel key
3J	27	6	CK	plain bow
3K	27	5	CK	
3L	68	5	CK	
3MA	57A	5, 6, 7	MK	formerly also for CK's
3MB	57B	5, 6, 7	MK	formerly also for CK's
3MC	57C	5, 6, 7	MK	formerly also for CK's
3MD	57D2	5, 6, 7	MK	
3N	77B1	5	CK	
3P	77B1	6	CK	
3PK	27	5	various	Obsolete CCL spacing.
3S	68	6	CK	
3T	68	6 long	CK	6 1/2 pin hotel key
3U	L2	5, 6	MK	
3V	77B1	7	CK	
3W	AR, BL, BR	5, 6	MK	Under GMK
3W	27	5, 6	CK or MK	Under GMK
3X	67	5	MK	stock
3Z	70	5, 6, 7	MK	Not Under GMK
4D	BL	5	CK	
4E	69	5, 6	MK	Under GMK
4F	77B2	5, 6, 7	MK	Under GMK
4H	28	6 long	CK	6 1/2 pin hotel key
4J	28	6	CK	
4K	28	5	CK	
4L	69	5	CK	
4N	77B2	5	CK	
4P	77B2	6	CK	
4R	Contact CCL Security Products in New Britain, CT.			
4S	69	6	CK	

Appendix B — Key Prefixes and Suffixes

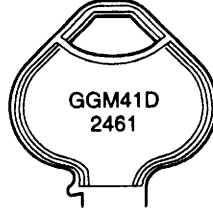
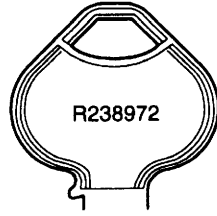
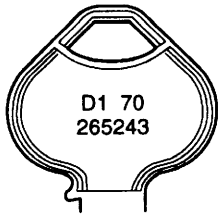
Corbin Listing by Prefix / Suffix

Prefix	Section	Pins	Type	Remarks
BL	BL	5, 6, 7	GMK	SUFFIX
BR	BR	6	CK	
BR	BR	5, 6, 7	GMK	SUFFIX
C	57C	5, 6, 7	GMK	SUFFIX
C1	57C1	5, 6, 7	GMK	SUFFIX
C12C	59C	5, 6	GMK	SUFFIX
C1C	59C1	5, 6	GMK	SUFFIX
C2	57C2	5, 6, 7	MK	SUFFIX
C2C	59C2	5, 6	GMK	SUFFIX
C2L	67	5	CK	special changes on CCL bow
C3X	67	5	MK	special MK on CCL bow
C9D	26	5	stock	obsolete, CCL bow
CC	26			obsolete
CD	59CD	5, 6	GMK	SUFFIX
CE	26			obsolete
CG	80	5	MK	under GMK, obsolete
CGM	80	5	GMK	obsolete
CK	80	5	CK	obsolete
CL	67	5	stock	CCL bow
CR	27	5	stock	blind codes CR200,000 & up
CX	80	5	CK	not under GMK, obsolete
D	57D	5, 6, 7	GMK	SUFFIX
D	98	4, 5	CK	under MK; obsolete blind
D1	57D1	5, 6, 7	GMK	SUFFIX
D12D	59D	5, 6	GMK	SUFFIX
D1D	59D1	5, 6	GMK	SUFFIX
D2	57D2	5, 6, 7	GMK	SUFFIX
D2	Restricted	5, 6	GMK	SUFFIX
D2D	59D2	5, 6	MK	SUFFIX
DC	57CD	5, 6, 7	GMK	SUFFIX
DD	59AD	5 or 6	GGMK	SUFFIX
DD1	Restricted	6	GMK	SUFFIX
E	96 (S-6786)	4	OEM	obs. blind codes, first cut .197"
EA	67	5	stock	blind codes EA200,000 & up
EE	77	5	stock	blind codes EE200,000 & up
G	67	5, 6, 7	GMK	SUFFIX
G12	067	5, 6, 7	GMK	SUFFIX
G2M	26	5	GMK	obsolete
G5M	FR	5	GMK	obsolete
G9M	96	5	GMK	obsolete
G95M	96-FR	5	GMK	multi-section, obsolete
GA	67A	5, 6, 7	GMK	SUFFIX
GA1	67A1	5, 6, 7	GMK	SUFFIX
GA2	67A2	5, 6, 7	GMK	SUFFIX
GAB	67AB	5, 6, 7	GGMK	SUFFIX
GB	67B	5, 6, 7	GMK	SUFFIX
GB1	67B1	5, 6, 7	GMK	SUFFIX
GB2	67B2	5, 6, 7	GMK	SUFFIX
GE75	96	4	OEM	obs. alike change, first cut .146"
GT	99	5	stock	blind codes
H	97	6 long	CK	6 1/2 pin hotel key
H	77	5, 6, 7	GMK	SUFFIX
H12	077	5, 6, 7	GMK	SUFFIX
HA	77A	5, 6, 7	GMK	SUFFIX
HA1	77A1	5, 6, 7	GMK	SUFFIX
HA2	77A2	5, 6, 7	GMK	SUFFIX
HAB	77AB	5, 6, 7	GGMK	SUFFIX

Prefix	Section	Pins	Type	Remarks
HB	77B	5, 6, 7	GMK	SUFFIX
HB1	77B1	5, 6, 7	GMK	SUFFIX
HB2	77B2	5, 6, 7	GMK	SUFFIX
HH	26			obs. blind codes, first cut .146"
IP	26			obsolete
J	97	6	CK	plain bow
K	97	5	CK	
K250	96	4	OEM	obs. alike change, first cut .146"
KK	AR	5	CK	
L	60	5, 6	GMK	SUFFIX
L	98 1/4, 98 1/2	5	MK	obsolete
LK	26			obsolete
M	60	5	CK	
M	98	4	MK	M10-6114 stock list; obsolete
MA	Restricted	5, 6, 7	GMK	SUFFIX
MA1	Restricted	5, 6, 7	GMK	SUFFIX
MA2	Restricted	5, 6, 7	GMK	SUFFIX
MAB	Restricted	5, 6, 7	GMK	SUFFIX
MAD	Restricted	5, 6, 7	GGMK	SUFFIX, 1500AD and up
MB	Restricted	5, 6, 7	GMK	SUFFIX
MB1	Restricted	5, 6, 7	GMK	SUFFIX
MB2	Restricted	5, 6, 7	GMK	SUFFIX
MC	Restricted	5, 6, 7	GMK	SUFFIX
MC1	Restricted	5, 6, 7	GMK	SUFFIX
MC2	Restricted	5, 6, 7	GMK	SUFFIX
MCD	Restricted	5, 6, 7	GGMK	SUFFIX
MD	Restricted	5, 6, 7	GMK	SUFFIX
MD1	Restricted	5, 6, 7	GMK	SUFFIX
MX	60	5	MK	
P	60	6	CK	
PX	60	5, 6	MK	
R	97, 99	4	OEM	Remington Register blind codes
SN	26			obsolete
T	26		CK	obsolete, first cut .146"
TH	26			obsolete
U	L2	5, 6	GMK	suffix
V	97	5	stock	
W	99	5	MK or CK	Under GMK; blind
W	27	5, 6, 7	GMK	SUFFIX
W0	97	5	MK or CK	Under GMK; blind
W12	027	5, 6, 7	GGMK	SUFFIX
WA1	27A1	5, 6, 7	GMK	SUFFIX
WA2	27A2	5, 6, 7	GMK	SUFFIX
WAB	27AB	5, 6, 7	GGMK	SUFFIX
WB1	27B1	5, 6, 7	GMK	SUFFIX
WB2	27B2	5, 6, 7	GMK	SUFFIX
X	99	4, 5	MK	stock list
X	27	5	MK	stock list 14000 & up
X0	97	4, 5	MK	stock list
XX	AR, BR, BL	5, 6	MK	2-level systems
XX	27, 27A1	5, 6	MK	3000 & up; large systems
XX	99	5	MK	large systems
XX0	97	5, 6	MK	large systems
Y	99	4	stock	blind codes on 5-pin blank
Y0	97	4	stock	blind codes on 5-pin blank
Z	99	5	stock	blind codes
Z	70	5 or 6	GMK	suffix

Ruswin Listing

Although Ruswin had more keyways than Corbin, the prefix system is much simpler.



Prefix	Key	Pins	Remarks
none	761	4	small pin rim cylinder, corrugated key, depths 0-7
0	A10	4	Hart & Hutchinson lockers
1A to 24A	A1 to A24	5 or 7	5-pin keys require a #5 guard pin cut in 6th position for old cylinders.
1D to 4D	D1 - D4	5, 6 or 7	multi-sections follow same logic
1F	861U	6	small pin knob locks; first cut at .146"
1H to 8H	H1 to H8	5, 6 or 7	multi-sections follow same logic
1K to 28K	N1 to N28	5 or 7	
1L	982	7	
1N to 28N	N1 to N28	6	
1Z to 8Z	A1 to A24	6	
2	252	5 or 6	5-pin keys require a #4 guard pin cut in 6th position for old cylinders.
28	2852	5 or 6	5-pin keys require a #4 guard pin cut in 6th position for old cylinders.
2L	983	7	
4	A4	4	Hart & Hutchinson lockers
5	900	4	small pin automobile cylinder
6	905	4	small pin automobile cylinder
7	752	5	
7	A7	4	Hart & Hutchinson lockers
8	852	5 or 6	5-pin keys require a #4 guard pin cut in 6th position for old cylinders.
9	861	4	small pin rim cylinder
D	D1	5, 6 or 7	Pre-System 70
E	900	4	E1 - 250 blind codes for small pin Nash and Essex auto cylinder
F	762	4	small pin rim cylinder, flat key
G	G	5	
GGM + other prefix = great grand master key			register number
GM + other prefix = grand master key			register number
H	751 old	5	diamond bow 752
H	A4 radius bottom	5	Hart & Hutchinson lockers
J	750	5	long blade 752
L	981	7	
L1L	9812	7	
M + other prefix = master key			register number
P	761	4	small pin rim cylinder, corrugated key, depths 0-6
R	981	5	#5 guard pin cut in 6th position required for old cylinders
RG	751 modern	5	Kwikset MK in 3-level system
RGM	751 modern	5	Kwikset GMK
RK	751 modern	5	Kwikset CK
RS	9812	5	
RX	751 modern	5	Kwikset MK, 2-level system
S	982	5	#5 guard pin cut in 6th position required for old cylinders
SS	900	4	SS1 - 500 blind codes for small pin automobile cylinder
T	983	5	#5 guard pin cut in 6th position required for old cylinders
V	981	6	
VW	9812	6	
W	982	6	
X	983	6	

Appendix C — Key Blank Cross Reference

There are several manufacturers of after-market key blanks. Each has its own numbering system. While these key blanks generally operate properly in Corbin Russwin cylinders, they are not manufactured to Corbin Russwin's specifications and some may not operate properly.

In order to help identify non-original key blanks, the major manufacturers' numbers are listed and followed by the original Corbin Russwin equivalent. The Corbin Russwin number only includes the bow shape when the non-original blank has a special bow. Discontinued blanks are marked with asterisks.

Cole / Curtis / ESP / Ilco-EZ

Curtis / ESP / Ilco-EZ	Corbin Russwin	Curtis / ESP / Ilco-EZ	Corbin Russwin	Curtis / ESP / Ilco-EZ	Corbin Russwin	Curtis / ESP / Ilco-EZ	Corbin Russwin
CO1	99-5	CO61-1/2	57A2-5	CO101		RU31	N1-6
CO2	99-6	CO62	77-6	CO61	57A2-7	RU32	N2-6
CO3	27-5	CO64	57B1-7	CO102	59C2-6	RU33	N3-6
CO4	27-6	CO65	69-5	CO107	59CD-6	RU34	N4-6
CO5	97-5	CO65 (Cole)	60-5	CO108	59D2-6	RU35	N5-6
CO6	97-6	CO66	69-7	CO110	57D2-6	RU36	N6-6
CO7	67-5	CO66 (Cole)	60-6	RU1	852-5	RU37	N7-6
CO8	96-5*	CO69	67A1-6	RU2	752-5	RU38	N8-6
CO9	26-6*	CO69-1/2	67A1-5	RU3	861B*	RU39	N9-6
CO13	99-7	CO71	57B2-7	RU4	981-5	RU40	N10-6
CO28	97-7	CO75	26-6*	RU5	252-5	RU41	N11-6
CO30	AR-5	CO83-1/2	77A1-6	RU7	A1x12M-5	RU42	N12-6
CO33	27-7	CO87	60-5	RU9	750B*	RU43	N13-6
CO34	57B2-6	CO88	60-6	RU11	761B*	RU44	751*
CO35	57A1-6	CO89	59AB-6	RU13	982-5	RU45	D1-5
CO35-1/2	57A1-5	CO91	59A1-6	RU13-1/2	982-6	RU46	D1-6
CO36	67-6	CO92	59A2-6	RU16	981-6	RU47	
CO37	67-7	CO93	59A-6	RU17	861UB*	RU49	D3-6
CO38	BR-7	CO94	59B1-6	RU18	N1x13M-5	RU51	D4-6
CO39	BR-5	CO95	59B2-6	RU18-1/2	N1x13M-6	RU52	D12-6
CO44	57B1-6	CO96	59B-6	RU20 (Cole)	D1-5	SK1	77-5
CO45	57A2-6	CO97	80-5*	RU21 (Cole)	D1-6	SK2	57AC-6
CO57	67B2-6	CO98	59C1-6	RU22 (Cole)	751*	SK4	77-7
CO60	57A1-7						

Dominion

Dominion	Corbin Russwin	Dominion	Corbin Russwin	Dominion	Corbin Russwin	Dominion	Corbin Russwin
00	99-5	01DM	59D-5	L01B1	59B1-7	U01B1	59B1-6
00A	99-7	01E	27-6	L01B2	59B2-7	U01B2	59B2-6
00AB	99-6	01EA	27-7	L01BM	59B-7	U01BM	59B-6
00K	96-5*	01EB	27-5	L01C1	59C1-7	U01C1	59C1-6
00KC	26-6*	01EG	67-6	L01C2	59C2-7	U01C2	59C2-6
00Z	60-5	01EL	67-7	L01CM	59C-7	U01CM	59C-6
L00Z	60-7	01EN	67-5	L01D1	59D1-7	U01D1	59D1-6
U00Z	60-6	01GH	80-5*	L01D2	59D2-7	U01D2	59D2-6
X00KC	26-6*	01GM	59AB-5	L01DM	59D-7	U01DM	59D-6
X00KR	861UB*	01GRM	59AD-5	L01GM	59AB-7	U01E	L2-6
01	97-5	01MA	57B1-6	L01GRM	59AD-7	U01GM	59AB-6
01A	97-7	01MB	57A2-6	L01RM	59CD-7	U01GRM	59AD-6
01A1	59A1-5	01MC	57D1-6	R01ED	57B2-6	U01RM	59CD-6
01A2	59A2-5	01MD	57D2-6	R01EE	57A1-6	11	852-5
01AB	97-6	01MG	57B2-6	R01EF	57A1-5	11-04A	S-3095B*
01AM	59A-5	01MJ	67A1-5	R01EG	77-6	11-04AS	H. & H. 4-pin*
01B1	59B1-5	01RM	59CD-5	R01EL	77-7	11B	861B *
01B2	59B2-5	A01MA	57B1-7	R01EN	77-5	11D1	D1-5
01BM	59B-5	A01MB	57A2-7	R01ES	077-5	11D2	D2-5
01C1	59C1-5	A01MF	57A1-7	R01MJ	77A1-5	11D3	D3-5
01C2	59C2-5	A01MJ	67A1-6	RA01MJ	77A1-6	11D4	D4-5
01CM	59C-5	L01A1	59A1-7	U01A1	59A1-6	11GH	751*
01D1	59D1-5	L01A2	59A2-7	U01A2	59A2-6	11GJ	
01D2	59D2-5	L01AM	59A-7	U01AM	59A-6	11K1	N1-5

Appendix C -- Key Blank Cross Reference

Dominion (Cont'd)

Dominion	Corbin Russwin	Dominion	Corbin Russwin	Dominion	Corbin Russwin	Dominion	Corbin Russwin
11K2	N2-5	11P	981-5	CB10	70-6-90	RUKM	N1x13M-6
11K3	N3-5	11P	981-5	CB11	L2-6-50	RUN15	N15-6
11K4	N4-5	11S	982-5	RUK1	N1-6	RUN16	N16-6
11K5	N5-5	11S	982-5	RUK2	N2-6	RUN17	N17-6
11K6	N6-5	11T	983-5	RUK3	N3-6	RUN18	N18-6
11K7	N7-5	A11D1	D1-6	RUK4	N4-6	RUN19	N19-6
11K8	N8-5	A11D2	D2-6	RUK5	N5-6	RUN20	N20-6
11K9	N9-5	A11D3	D3-6	RUK6	N6-6	RUN21	N21-6
11K10	N10-5	A11D4	D4-6	RUK7	N7-6	RUN22	N22-6
11K11	N11-5	A11P	981-6	RUK8	N8-6	RUN23	N23-6
11K12	N12-5	A11S	982-6	RUK9	N9-6	RUN24	N24-6
11K13	N13-5	A11T	983-6	RUK10	N10-6	RUN25	N25-6
11KM	N1x13M-5	12	752-5	RUK11	N11-6	RUN26	N26-6
11M	A1x12M-5	12A	750B*	RUK12	N12-6	RUN27	N27-6
11MA	A1x12M-6	CB 9	L2-6-90	RUK13	N13-6	RUN28	N28-6

Iico

Iico	Corbin Russwin	Iico	Corbin Russwin	Iico	Corbin Russwin	Iico	Corbin Russwin
CB 9	L2-6-90	1001EK	79-6	A1001HP	68-6	R1001ES	077-5
CB10	70-6-90	1001EL	67-7	A1001MA	57B1-7	R1001ET	077-6
CB11	L2-6-50	1001EN	67-5	A1001MB	57A2-7	R1001GA	BL-7
CB11BH	59B1-6-50	1001EP	027-5	A1001MC	28-7	R1001MJ	77A1-5
1000	99-5	1001ES	067	A1001MD	29-7	R1001SA	28-5
1000A	99-7	1001FH	59A2-5	A1001MF	57A1-7	R1001SB	29-5
1000AB	99-6	1001G*	BR-5	A1001MG	57B2-7	X1001KC	26-6 *
1000K	96-5*	1001GA	BR-7	A1001MJ	67A1-6	1002A	98-1/2*
1000KC	26-6*	1001GAR	BL-6	A1001MJR	77A1-6	1002B	98-1/4*
O1000	99-4*	1001GB	BR-5	B1001EJ	69-6	1002C	98*
X1000KC	26-6*	1001GH	80-5*	L1001ABM	59AB-7	1011	852-5
X1000KR	861UB*	1001GR	BL-5	L1001AH	59A1-7	1011-04A	S-3095B*
1001	97-5	1001GRM	59AD-5	L1001AM	59A-7	1011-04AS	H. & H. 4-pin*
1001A	97-7	1001MA	57B1-6	L1001BH	59B1-7	1011-28N	N28-5
1001A1	62A1-6	1001MB	57A2-6	L1001BM	59B-7	1011A	252-5
1001A2	62A2-6	1001MC new	57D1-6	L1001C1	59C1-7	1011AX*	A6-5
1001AB	97-6	1001MC old	28-6	L1001C2	59C2-7	1011B	861B*
1001ABM	59AB-5	1001MD	29-6	L1001CDM	59CD-7	1011BX*	
1001AH	59A1-5	1001ME	68-6	L1001CM	59C-7	1011C*	
1001AM	59A-5	1001MG	57B2-6	L1001D1	59D1-7	1011D1	D1-5
1001BA*	27A1-6	1001MJ	67A1-6	L1001D2	59D2-7	1011D2	D2-5
1001BH	59B1-5	1001MK		L1001D3	59B2-7	1011D3	D3-5
1001BM	59B-5	A1001ABM	59AB-6	L1001DH	59D-7	1011D4	D4-5
1001C	AR-5	A1001AH	59A1-6	L1001DM	59D-7	1011D12	D12-5
1001C1	59C1-5	A1001AM	59A-6	L1001EH	60-7	1011D34	D34-5
1001C2	59C2-5	A1001BH	59B1-6	L1001FH	59A2-7	1011D41	D41-5
1001CDM	59CD-5	A1001BM	59B-6	L1001GRM	59AD-7	1011E*	
1001CM	59C-5	A1001C1	59C1-6	M1001	027-5	1011E*	
1001D1	59D1-5	A1001C2	59C2-6	O1001E	L2-6	1011G*	A5-5
1001D2	59D2-5	A1001CDM	59CD-6	R1001CEM	57ABC-5	1011GG*	A4-5
1001DH	59B2-5	A1001CM	59C-6	R1001ED	57B2-6	1011GH	751*
1001DM	59D-5	A1001D1	59D1-6	R1001EE	57A1-6	1011GJ	
1001E	27-7	A1001D2	59D2-6	R1001EF	57A1-5	1011H*	A1-5
1001EA	27-6	A1001DH	59B2-6	R1001EG	77-6	1011J*	A3-5, A11-5
1001EB	27-5	A1001DM	59D-6	R1001EK	57D2-6	1011JJ*	A9-5
1001EG	67-6	A1001EH	60-6	R1001EL	77-7	1011JR*	A7-5
1001EH	60-5	A1001EHR	70-6	R1001EM	57ABC-6	1011K*	A12-5
1001EJ	69-5	A1001FH	59A2-6	R1001EN	77-5	1011K1	N1-5
		A1001GRM	59AD-6	R1001EP	57D1-6	1011K2	N2-5

Appendix C -- Key Blank Cross Reference

Ilco (Cont'd)

Ilco	Corbin Russwin	Ilco	Corbin Russwin	Ilco	Corbin Russwin	Ilco	Corbin Russwin
1011K3	N3-5	1011X*	905B*	A1011H7	H7-6	L1011L41	L41-7
1011K4	N4-5	A1011-1N	N1-6	A1011H8	H8-6	N1011M	9812-5
1011K5	N5-5	A1011-2N	N2-6	A1011L1	L1-6	N1011P	981-5
1011K6	N6-5	A1011-3N	N3-6	A1011L2	L2-6	N1011S	982-5
1011K7	N7-5	A1011-4N	N4-6	A1011L3	L3-6	N1011T	983-5
1011K8	N8-5	A1011-5N	N5-6	A1011L4	L4-6	R1011X*	
1011K9	N9-5	A1011-6N	N6-6	A1011L12	L12-6	X1011KR	861UB*
1011K10	N10-5	A1011-7N	N7-6	A1011L34	L34-6	1012	752-5
1011K11	N11-5	A1011-8N	N8-6	A1011L41	L41-6	1012A	750B*
1011K12	N12-5	A1011-9N	N9-6	A1011M	9812-6	1012C*	745B*
1011K13	N13-5	A1011-10N	N10-6	A1011P	981-6	1012-D1	D1-5
1011KA*	A2-5	A1011-11N	N11-6	A1011PB	N5-6	1012-D2	D2-5
1011L*	A6-5	A1011-12N	N12-6	A1011PC	N3-6	1012-D3	D3-5
1011L1	L1-5	A1011-13N	N13-6	A1011PD	N1-6	1012-D4	D4-5
1011L2	L2-5	A1011-14N	N14-6	A1011PE	N4-6	1012-D12	D12-5
1011L3	L3-5	A1011-15N	N15-6	A1011PF	N6-6	1012-D34	D34-5
1011L4	L4-5	A1011-16N	N16-6	A1011PG	N7-6	1012-D41	D41-5
1011L12	L12-5	A1011-17N	N17-6	A1011PH	N8-6	1012DM	761B*
1011L34	L34-5	A1011-18N	N18-6	A1011PJ	N9-6	A1012-59A	59A-6
1011L41	L41-5	A1011-19N	N19-6	A1011PK	N2-6	A1012-59A1	59A1-6
1011M	A1x12M-5	A1011-20N	N20-6	A1011PL	N10-6	A1012-59A2	59A2-6
1011MA	A1x12M-6	A1011-21N	N21-6	A1011PM	N11-6	A1012-59AB	59AB-6
1011MK	H81-6	A1011-22N	N22-6	A1011PN	N12-6	A1012-59AD	59AD-6
1011N*	G-5	A1011-23N	N23-6	A1011PR	N13-6	A1012-59B	59B-6
1011P	981-5	A1011-24N	N24-6	A1011PY	N14-6	A1012-59B1	59B1-6
1011PAA	981-7	A1011-25N	N25-6	A1011PZ	N1x13M-6	A1012-59B2	59B2-6
1011PB*	N5-5	A1011-26N	N26-6	A1011PZR	N15x27M-6	A1012-59C	59C-6
1011PC*	N3-5	A1011-27N	N27-6	A1011S	982-6	A1012-59C1	59C1-6
1011PD*	N1-5	A1011-28N	N28-6	A1011T	983-6	A1012-59C2	59C2-6
1011PE*	N4-5	A1011D1	D1-6	B1011D1	D1-7	A1012-59CD	59CD-6
1011PF*	N5-5	A1011D2	D2-6	B1011D2	D2-7	A1012-59D	59D-6
1011PG*	N7-5	A1011D3	D3-6	B1011D3	D3-7	A1012-59D1	59D1-6
1011PH	N8-5	A1011D4	D4-6	B1011D4	D4-7	A1012-59D2	59D2-6
1011PJ*	N9-5	A1011D12	D12-6	B1011D12	D12-7	A1012-D1	D1-6
1011PK*	N2-5	A1011D34	D34-6	B1011D34	D34-7	A1012-D2	D2-6
1011PL*	N10-5	A1011D41	D41-6	B1011D41	D41-7	A1012-D3	D3-6
1011PM	N11-5	A1011H1	H1-6	L1011L1	L1-7	A1012-D4	D4-6
1011PN*	N12-5	A1011H2	H2-6	L1011L2	L2-7	A1012-D12	D12-6
1011PR*	N13-5	A1011H3	H3-6	L1011L3	L3-7	A1012-D34	D34-6
1011PZ	N1x13M-5	A1011H4	H4-6	L1011L4	L4-7	A1012-D41	D41-6
1011S	982-5	A1011H5	H5-6	L1011L12	L12-7	1062V*	740B*
1011T	983-5	A1011H6	H6-6	L1011L34	L34-7		

Appendix C — Key Blank Cross Reference

Taylor

Taylor	Corbin Russwin	Taylor	Corbin Russwin	Taylor	Corbin Russwin	Taylor	Corbin Russwin
20	99-5	22CM	59C-5	55-6A	A6-5	57-8K	N8-7
20A	99-7	22D1	59D1-5	55-6K	N6-5	57-8N	N8-6
20AB	99-6	22D2	59D2-5	55-7A	A7-5	57-9K	N9-7
20K	96-5*	22DM	59D-5	55-7K	N7-5	57-9N	N9-6
20KC	26-6*	22GM	59AB-5	55-8A	A8-5	57-10K	N10-7
L20KC	26-6*	22HM	59CD-5	55-8K	N8-5	57-10N	N10-6
21A	27-6	22Z2	60-5	55-9A	A9-5	57-11K	N11-7
21E	27-7	A22A1	59A1-6	55-9K	N9-5	57-11N	N11-6
21EB	27-5	A22A2	59A2-6	55-10A	A10-5	57-12D	D12-5
21EG	67-6	A22AM	59A-6	55-10K	N10-5	57-12K	N12-7
21EL	67-7	A22B1	59B1-6	55-11A	A11-5	57-12N	N12-6
21EN	67-5	A22B2	59B2-6	55-11K	N11-5	57-13K	N13-7
A21EF	57A1-7	A22BM	59B-6	55-12A	A12-5	57-13N	N13-6
A21EG	57B1-7	A22C1	59C1-6	55-12K	N12-5	57-15N	N15-6
A21EH	57A2-7	A22C2	59C2-6	55-13K	N13-5	57-16N	N16-6
A21EJ	57B2-7	A22CM	59C-6	55A	252-5	57-17N	N17-6
A21HN	BR-7	A22D1	59D1-6	55B	861B	57-18N	N18-6
B21EF	57A1-6	A22D2	59D2-6	55K		57-19N	N19-6
B21EG	57B1-6	A22DM	59D-6	55M	A1x12M-5	57-20N	N20-6
B21EH	57A2-6	A22GM	59AB-6	55P	981-5	57-21N	N21-6
B21EJ	57B2-6	A22HM	59CD-6	55PAA	981-7	57-22N	N22-6
B21EM	57ABC-6	A22Z2	60-6	55PK	N2-5	57-23N	N23-6
B21EP	57D2-6	B22A1	59A1-7	55S	982-5	57-24N	N24-6
B21FK	67A1-6	B22A2	59A2-7	56	752-5	57-25N	N25-6
B21HP	68-6	B22AM	59A-7	56DM	761B*	57-26N	N26-6
C21EF	57A1-5	B22B1	59B1-7	L56K	861UB*	57-27N	N27-6
C21EM	57ABC-5	B22B2	59B2-7	57-1D	D1-5	57-34D	D34-5
C21FK	67A1-5	B22BM	59B-7	57-1H	H1-6	57-41D	D41-5
C21FL	69-5	B22C1	59C1-7	57-1K	N1-7	57M	N1x13M-5
C21FM	067	B22C2	59C2-7	57-1N	N1-6	57MA	N1x13M-6
C21HN	BR-5	B22CM	59C-7	57-2D	D2-5	57MK	
R21EG	77-6	B22D1	59D1-7	57-2H	H2-6	57P	981-5
R21EL	77-7	B22D2	59D2-7	57-2K	N2-7	57PA	981-6
R21EN	77-5	B22DM	59D-7	57-2N	N2-6	57R	751*
RA21HN	BL-7	B22GM	59AB-7	57-3D	D3-5	57SA	982-6
RB21EJ	27A1-6	B22HM	59CD-7	57-3H	H3-6	57T	983-5
RB21FK	77A1-6	K22	80-5*	57-3K	N3-7	57TA	983-6
RB21FL	79-6	K22MK		57-3N	N3-6	A57-1D	D1-6
RB21FM	077-6	23	97-5	57-4D	D4-5	A57-2D	D2-6
RB21HN	BL-6	23A	97-7	57-4H	H4-6	A57-3D	D3-6
RC21EJ	27A1-5	23AB	97-6	57-4K	N4-7	A57-4D	D4-6
RC21FK	77A1-5	55	852-5	57-4N	N4-6	A57-12D	D12-6
RC21FM	077-5	55-1A	A1-5	57-5H	H5-6	A57-34D	D34-6
RC21HN	BL-5	55-1K	N1-5	57-5K	N5-7	A57-41D	D41-6
22A1	59A1-5	55-2A	A2-5	57-5N	N5-6	B57-1D	D1-7
22A2	59A2-5	55-2K	N2-5	57-6H	H6-6	B57-2D	D2-7
22AM	59A-5	55-3A	A3-5	57-6K	N6-7	B57-3D	D3-7
22B1	59B1-5	55-3K	N3-5	57-6N	N6-6	B57-4D	D4-7
22B2	59B2-5	55-4A	A4-5	57-7H	H7-6	B57-12D	D12-7
22BM	59B-5	55-4K	N4-5	57-7K	N7-7	B57-34D	D34-7
22C1	59C1-5	55-5A	A5-5	57-7N	N7-6	B57-41D	D41-7
22C2	59C2-5	55-5K	N5-5	57-8H	H8-6	58MK	H81-6

Primary Terms From
The Professional Glossary of Terms Relating to
**Cylinders, Keys and
Master Keying**

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- core**
n. a complete unit, often with a figure 8 shape, which usually consists of the plug, shell, tumblers, springs, plug retainer and spring cover(s). It is primarily used in removable and interchangeable core cylinders and locks.
- CPP**
abb. Certified Protection Professional (as certified by ASIS)
- cross keying**
n. the deliberate process of combining a cylinder (usually in a master key system) to two or more different keys which would not normally be expected to operate it together. See also "controlled cross keying", "uncontrolled cross keying".
- cruciform key**
n. adj. of or pertaining to a key section or keyway which usually resembles a plus sign ("+") or the letter "X"
- CSI**
abb. Construction Specifiers Institute
- cut**
2. v. to make cuts into a key blade
- cut angle**
n. 1. a measurement, usually expressed in degrees, for the angle between the two sides of a key cut
- cut edge**
n. the portion of the key blade which contains the cuts
- cut key**
n. a key which has been bitted or combined
- cut root**
n. the bottom of a key cut
- cut root shape**
n. the shape of the bottom of a key cut. It may have a flat or radius of a specific dimension, or be a perfect "V".
- cutter**
n. the part of a key machine which makes the cuts into the key blank
- cylinder**
n. a complete operating unit which usually consists of the plug, shell, tumblers, springs, plug retainer, a cam/tailpiece or other actuating device, and all other necessary operating parts
- cylinder blank**
n. a dummy cylinder which has a solid face and no operating parts
- cylinder clip**
n. a spring steel device used to secure some types of cylinders
- cylinder collar**
n. a plate or ring installed under the head of a cylinder to improve appearance and/or security
- cylinder guard**
n. a protective cylinder mounting device
- cylinder key**
n. a broad generic term including virtually all pin and disc tumbler keys
- D —
- declining step key**
n. a key whose cuts are progressively deeper from bow to tip
- decode**
v. to determine a key combination by physical measurement of a key and/or cylinder parts
- decoder gauge**
n. a measuring device which helps determine the combination of a lock or cylinder without removing the tumblers
- degree of rotation**
n. a specification for the angle at which a cut is made into a key blade as referenced from the perpendicular; e.g., right (R or 2), left (L or 1) or center (=perpendicular) (C). This specification is typically used for some high security keys.
- department master key**
n. a master key which operates all or most master keyed locks of a given department
- depth key set**
n. a set of keys used to make a code original key on a key duplicating machine to a lock manufacturer's given set of key biting specifications. Each key is cut with the correct spacing to one depth only in all biting positions, with one key for each depth.
- derived series**
n. a series of blind codes and bittings which are directly related to those of another biting list
- DHI**
abb. Door and Hardware Institute
- dimple**
n. a key cut in a dimple key
- dimple key**
n. a key whose cuts are drilled or milled into its blade surfaces. The cuts normally do not change the blade silhouette.
- direct code**
n. a designation assigned to a particular key which includes the actual combination of the key
- disc tumbler**
n. 1. a flat tumbler which must be drawn into the cylinder plug by the proper key so that none of its extremities extends into the shell
2. a flat, usually rectangular tumbler with a gate which must be aligned with a sidebar by the proper key
- display key**
n. a special change key in a hotel master key system which will allow access to one designated guest room, even if the lock is in the shut out mode. It may also act as a shut out key for that room.
- dogging cylinder**
n. a key operated cylinder used to dog an exit device
- dogging key**
n. a key or tool used to dog an exit device
- double-acting lever tumbler**
n. one which must be lifted a precise amount, neither too little nor too much to allow movement of a bolt
- double bitted key**
n. a key bitted on two opposite surfaces
- double cylinder**
adj. pertaining to a lock with two keyed cylinders
- double-D**
n. a shape consisting of two opposing arcs and two opposing flats
adj. having such a shape
- double pin**
v. to place more than one master pin in a single pin chamber
- drilled key**
n. a type of bit key with a hole drilled into the shank from the tip
- driver spring**
n. a spring placed on top of the pin stack to exert pressure on the pin tumblers
- drop**
2. a pivoting or swinging dust cover
- dual custody**
1. n. a function designed to require the presence of two persons with two different keys, combinations or codes to operate the same device
2. adj. pertaining to such a function
- dummy cylinder**
n. a non-functional facsimile of a rim or mortise cylinder used for appearance only, usually to conceal a cylinder hole
- duplicate**
2. v. to copy
- duplicate key**
n. any key reproduced from a pattern key
- dust cover**
n. a device designed to prevent foreign matter from entering a mechanism through the keyway
- dustproof cylinder**
n. a cylinder designed to prevent foreign matter from entering either end of the keyway

key manipulation

n. manipulation of an incorrect key in order to operate a lock or cylinder

key milling

n. the grooves machined into the length of the key blade to allow its entry into the keyway

key override

1. n. a provision allowing interruption or circumvention of normal operation of a combination lock or electrical device
2. adj. of or pertaining to such a provision, as in "key override cylinder"

key override cylinder

n. a lock cylinder installed in a device to provide a key override function

key pull position

n. any position of the cylinder plug at which the key can be removed

key records

n. pl. records which typically include some or all of the following: bitting list, key bitting array, key system schematic, end user, number of keys/cylinders issued, names of persons to whom keys were issued, hardware/keying schedule

key retaining

adj. 1. of or pertaining to a lock which must be locked before its key can be removed
2. of or pertaining to a cylinder or lock which may prevent removal of a key without the use of an additional key and/or tool

key section

n. the exact cross sectional configuration of a key blade as viewed from the bow toward the tip

key switch

n. a switch operated by a keyed lock mechanism which may be an integral part of the switch assembly

key symbol

n. a designation used for a key combination in the standard key coding system, e.g., A, AA, AA1, etc.

key system schematic

n. a drawing with blocks utilizing keying symbols, usually illustrating the hierarchy of all keys within a master key system. It indicates the structure and total expansion of the system.

key trap core/cylinder

n. a special core or cylinder designed to capture any key to which it is combined, once that key is inserted and turned slightly

keyed

adj. 1. combined
2. having provision for operation by key

keyed alike

adj. of or pertaining to two or more locks or cylinders which have or are to have the same combination. They may or may not be part of a keying system.

keyed different

adj. of or pertaining to a group of locks or cylinders, each of which is or is to be combined differently from the others. They may or may not be part of a keying system.

keyed random

adj. of or pertaining to a cylinder or group of cylinders selected from a limited inventory of different key changes. Duplicate bittings may occur.

keyhole

n. the opening through which a non-cylinder key must pass to enter a lock

keyhole plate

n. an escutcheon for a keyhole

keying

n. any specification for how a cylinder or group of cylinders are or are to be combined in order to control access

keying conference

n. a meeting of the end user and the key system supplier at which the keying and levels of keying, including future expansion, are determined and specified

keying kit

n. a compartmented container which holds an assortment of tumblers, springs and/or other parts

keying schedule

n. a detailed specification of the keying system listing how all cylinders are to be keyed and the quantities, markings, and shipping instructions of all keys and/or cylinders to be provided

keying symbol

n. a designation used for a lock or cylinder combination in the standard key coding system; e.g., AA1, XAA1, X1X, etc.

keyway

n. 1. the opening in a lock or cylinder which is shaped to accept a key bit or blade of a proper configuration
2. the exact cross sectional configuration of a keyway as viewed from the front. It is not necessarily the same as the key section.

keyway post

n. 1. the projecting pin of a lock or cylinder which enters the hollow end of a key

keyway unit

n. the plug of certain binary type disc tumbler key-in-knob locks

keyway ward

n. a ward which prevents entry of an incorrect key into a cylinder lock

KR

1. abb. keyed random
2. abb. key retaining

KWY

abb. keyway

— L —

layout tray

n. a compartmented container used to organize cylinder parts during keying or servicing

lazy cam/tailpiece

n. a cam or tailpiece designed to remain stationary while the cylinder plug is partially rotated and/or vice-versa

levels of keying

n. pl. the divisions of a master key system into hierarchies of access, as shown in the following tables. Note that the standard key coding system has been expanded to include key symbols for systems of more than four levels of keying.

TWO LEVEL SYSTEM

Level of Keying	Key Name	abb.	Key Symbol
Level II	master key	MK	AA
Level I	change key	CK	1AA, 2AA, etc.

THREE LEVEL SYSTEM

Level of Keying	Key Name	abb.	Key Symbol
Level III	grand master key	GMK	A
Level II	master key	MK	AA, AB, etc.
Level I	change key	CK	AA1, AA2, etc.

FOUR LEVEL SYSTEM

Level of Keying	Key Name	abb.	Key Symbol
Level IV	great grand master key	GGMK	GGMK
Level III	grand master key	GMK	A, B, etc.
Level II	master key	MK	AA, AB, etc.
Level I	change key	CK	AA1, AA2, etc.

FIVE LEVEL SYSTEM

Level of Keying	Key Name	abb.	Key Symbol
Level V	great great grand master key	GGGMK	GGGMK
Level IV	great grand master key	GGMK	A, B, etc.
Level III	grand master key	GMK	AA, AB, etc.
Level II	master key	MK	AAA, AAB, etc.
Level I	change key	CK	AAA1, AAA2, etc.

SIX LEVEL SYSTEM

Level of Keying	Key Name	abb.	Key Symbol
Level VI	great great grand master key	GGGMK	GGGMK
Level V	great grand master key	GGMK	A, B, etc.
Level IV	grand master key	GMK	AA, AB, etc.
Level III	master key	MK	AAA, AAB, etc.
Level II	sub-master key	SMK	AAAA, AAAB, etc.
Level I	change key	CK	AAAA1, AAAA2, etc.

- T -

tailpiece

n. an actuator attached to the rear of the cylinder, parallel to the plug, typically used on rim, key-in-knob or special purpose cylinders

theoretical key changes

n. pl. the total possible number of different combinations available for a specific cylinder or lock mechanism

three column progression

n. a process wherein key bittings are obtained by using the cut possibilities in three columns of the key biting array

three pin master key

n. a master key for all combinations obtained by progressing three biting positions

throat cut

n. the cut made into a key to bypass a throat ward

throat ward

n. an obstruction formed in a lock's case or horn at the point of key entry which prevents key rotation

thumb turn cylinder

n. a cylinder with a turn knob rather than a keyway and tumbler mechanism

tip

n. the portion of the key which enters the keyway first

tip stop

n. a type of stop located at or near the tip of the key

TMK

abb. top master key

tolerance

n. the deviation allowed from a given dimension

top master key

n. the highest level master key in a master key system

top of blade

n. the bitted edge of a single bitted key

top pin

n. usually a cylindrical shaped tumbler, usually flat on both ends and installed directly under the spring in the pin stack

total position progression

n. a process used to obtain key bittings in a master key system wherein bittings of change keys differ from those of the top master key in all biting positions

try-out key

n. a manipulation key which is usually part of a set, used for a specific series, keyway, and/or brand of lock

tubular key

n. a key with a tubular blade. The key cuts are made into the end of the blade, around its circumference.

tumbler

n. a movable obstruction of varying size and configuration in a lock or cylinder which makes direct contact with the key or another tumbler and prevents an incorrect key or torquing device from activating the lock or other mechanism

tumbler spring

n. any spring which acts directly on a tumbler

two column progression

n. a process wherein key bittings are obtained by using the cut possibilities in two columns of the key biting array

two pin master key

n. a master key for all combinations obtained by progressing two biting positions

two step progression

n. a progression using a two increment difference between bittings of a given position

- U -

UL

abb. Underwriters Laboratories

unassociated change key

n. a change key which is not related directly to a particular master key through the use of certain constant cuts

unassociated master key

n. a master key which does not have change keys related to its combination through the use of constant cuts

uncombined

adj. 1. of or pertaining to a cylinder which is or is to be supplied without keys, tumblers and springs
2. of or pertaining to a lock, cylinder or key in which the combination has not been set

uncontrolled cross keying

n. a condition in which two or more different keys under different higher level keys operate one cylinder by design; e.g., XAA1 operated by AB, AB1

NOTE: This condition severely limits the security of the cylinder and the maximum expansion of the system, and often leads to key interchange

unidirectional cylinder

n. a cylinder whose key can turn in only one direction from the key pull position, often not making a complete rotation

- V -

vertical group master key

n. the two pin master key for all combinations listed in all blocks in a line down a page in the standard progression format

VGM

abb. vertical group master key

visual key control

n. a specification that all keys and the visible portion of the front of all lock cylinders be stamped with standard keying symbols

VKC

abb. visual key control

- W -

ward

n. a usually stationary obstruction in a lock or cylinder which prevents the entry and/or operation of an incorrect key

ward cut

n. a modification of a key which allows it to bypass a ward

warded

adj. having one or more wards

- X -

X

symbol used in hardware schedules to indicate a cross keyed condition for a particular cylinder; e.g., XAA2, X1X (but not AX7)

- Z -

zero bitted

adj. of or pertaining to a cylinder which is or is to be combined to keys cut to the manufacturer's reference number "0" biting