Randy Main, Author
Arnold Sintnicolaas, Co Author

The following pages, will cover the types of master ring cylinders, how they work, hands-on pinning on your own workbench. This is a step-by-step easy course; however, take quite evening alone to study.

The famous master ring cylinder is a unique method of master keying that is more secure, flexible, and larger capacity than ordinary systems. Only Corbin and Russwin offer this system, each with their family keyways. Today only two types of master ring cylinders are produced. One is the unit lock and heavy-duty cylinders are produced, one is the Unit lock and heavy-duty cylindrical lock cylinder, the other is the jumbo mortise and rim cylinder. Your study will focus on the Corbin family.

The basic theory of the master ring cylinder is to provide two shear-lines, doubling the potential for master keying. One shear-line is on the plug; this is standard keying as with an ordinary cylinder. The other shear-line is on the master ring; this is keyed a bit differently, as you will see on the following pages. In actual operation a master ring cylinder can have many alter keys on the plug and many master keys on the master ring.

Let's see how this accomplished. The cylinder you are maybe working with is a Corbin Jumbo cylinder. To re-key the cylinder remove pin hole cover, shake out all the springs plus the old pins. A key is to be selected as change key plus another one to be used as the master key. The term change key simply refers to room or operator key. Key #1 cuts are 4 2 4 2 3 4 and key #2, the master key, cuts are 5 6 4 4 12.

"Wait a minute" you say! One of the cuts (first position) is only one increment off the master rules do not allow that! Not the worry, master ring keying allows one digit difference between the change and master bitting. Also Corbin's "System 70" allows that for even standard non-master ring cylinders. System 70, as a note, uses every other standard depth and then renumbered them renumbered them 1 through 10, back to your cylinder.

Select key #1, cuts are 4 2 4 2 3 4. Pin up that combination with your Corbin/Russwin Pin Kit PK—1070. You should get a beautiful shear-line. Now remove the #1 key and insert key #2, our designed master. Obviously we do not have a shear-line, leave the shell off, and line up the pin holes. Note: There is a front and a rear to the master ring, the pin hole drilled closets to the edge is the front. Now reinsert key #2 in the plug, helping the plug to line up with master ring. If we were to drop in long master pins

on top of the bottom pins that were just the correct length, we could have another shear-line! Let's not guess and try various pins, let's calculate.

1. Write the master key bitting above the change key bitting.

MK 5 6 4 4 1 2
CK 4 2 3 2 3 4

2. Write the change key bitting under the line. If we had multiple change keys, we would do standard master keying for them at this time. Let's keep it simple for now!

MK 5 6 4 4 1 2
CK 4 2 4 2 3 4

Bottom Pin BP 4 2 4 2 2 3 4

3. Take the difference from the change key to the master key, for that position, and write the difference under the bottom pins.

(The difference in position 1 = 4, to 5 is 1.)

MK 5 6 4 4 1 2
CK 4 2 4 2 3 4
BP 4 2 4 2 3 4

Master Ring MR 1 4 0 2 2 2

4. If the master bitting is larger that the change key bitting, our master ring pin becomes positive (+). If the change key bitting is larger than the master, the master ring becomes negative (-). Zero pins remain zero.

MK 5 6 4 4 1 2
CK 4 2 4 2 3 4
BP 4 2 4 2 3 4
MR +1 +4 0 +2 -2 -2

5. The driver pins must now be calculated. The master key bitting is used as a code to pick out ring master pins to act as drivers.

Master key Bitting	Driver pin
1	+3
2	+2
3	-1
4	0
5	-1
6	-2

MK 5 6 4 4 1 2
CK 4 2 4 2 3 4
BP 4 2 4 2 3 4
MR +1 +4 0 +2 -2 -2
Driver pin DP -1 -2 0 0 +3 +2

Let's assemble the master ring cylinder, for those who are lucky enough to have a Master Ring Cylinder. Master Ring cylinders must be assembled **twice**, once is a dry run to make sure everything fits. If you try to load through the top and hope for the best, you tend to lose time in the long run on problem cylinders. This is the voice of experience. Time to successfully load a cylinder and place it in a lock is 15 minutes. This time does not include removing the lock from the door or answering The shop phone. Let's key a cylinder.

The bottom pins should be still in the plug. The plug is the first item to receive pins.

With no key in the plug, plate the master ring; remember the front of the Master Ring has the pin hole drilled closets to the edge.

Insert the master key and load the master pins. You should get a beautiful shear-line.

Remove the master key (carefully!) and now drop in the driver pins. They should come above the shear-line and be nearly even.

Satisfied the pins are correct, carefully remove and lay out the driver and master ring pins. Remove the master ring itself from the plug. Leave the bottom pins in the plug.

Place the master ring in the shell, front of the master ring in first, and then insert the plug in the shell/master ring combination. Try to have the pin holes lined up.

Place the master ring and driver pins in the proper pin holes, load the springs, and put the cap on. Don't forget the waldes ring or for the mortise cylinder. As a note, we secure the cap by placing the handle of my tweezer on the cap and gently tapping it home with a small hammer.

Now the moment of truth, does it work? Of course it works!

Master Ring Tips and Secrets

The cap that is used to secure the springs in place cost about .35cents, straighten your old ones out and safe a little money. Grease them in the middle by holding with pliers and tapping with a ssmall hammer.

Sometimes a cylinder is just too tight, rap the plug with a rawhide mallet. Make sure not to rap your fingers in the process!

Corbin has a reamer available (.115 diameter – approximate) that is used to encourage pin holes to line up. Very useful.

Never trade mister rings from shell to shell, it will not work. Plug trade easily.

A non master ring cylinder is available to eliminate the master ring. This non master ring is now stock on new locks. (usually)

Russwin plugs fit fine in Corbin Master Ring shells, the spacing is identical.

Extra Credit

Feeling like you accomplish anything? Let's reverse the change and master keys, so key #1 is the master and key #2 is the change.

Under the flap is the correct bitting chart for this exercise. Don't peek try to lay out yourself, we know you can do it!

Extra Credit

Feeling like you accomplished anything? Let's reverse the change and master Keys, so key #1 is the master and key #2 is the change. Look below for the correct bitting chart for is exercise! Try to do it yourself; we know you can do it!

Key #1	4	2	4	2	3	4
Key #2	5	6	4	4	1	2
BP	5	6	4	4	1	2
MR	-1	-4	0	-2	+2	+2

Corbin Keyways

Corbin has two families of keyways, new and old, plus two styles of keying, standard and System 70. Standard keying which reads **tip to bow** has to depths. System 70, which reads **bow to tip**, has 6 depths. The standard **"Old Keyway"** recently charged plug diameters and matches the **"New Keyway"** diameter. Keyways available are 27, 56, 67, for **"Old"** 59 and 60 for **"New".** All of except for keyway 60. as an example a keyway may be called out as 27A1 or 59C2. Other keyways and reverse keyways are available, however not to common. Keyway 60 is known as **"Stock Keyway"** and comes if not asking for something else. Old keyway usually has an extra charge when ordered with a new lock.

You are probably saying to yourself, "Gee this is kind of complicated". Again not to worry, most locks out of the factory are 60 Keyway, System 60, just 6 depths (similar to Kwikset!). Let's look at all the pin sizes for everything Corbin makes.

Bottom Pins

New Keyway Old Keyway (new diameter)		Old Keyway (old diameter)	
Standard keying	System 70	Standard keying	System 70
1. .203	1.	203	1. .171
1. .171			
2. .218			2. .185
3. .231	2.	.231	3. .198
2. .198			
4. .246			4. .212
5. .259	3.	.259	5. .226
3. .226			
6. .273			6. .241
7. .287	4.	.287	7. 256
4. .256			
8. .301			8. .269
9. .315	5.	.315	9. .284
5. .284			
0. .330			0. .297
	6.	.345	
6. .311			

Master-Ring Pins

New Keyway

Old Keyway (new diameter)				Old Key (old diameter)			
Standard Keying		System 70		Standard Keying		System 70	
		+5	.282			+5	.303
+9	.268			+9	.289		
+8	.255	+4	.255	+8	.275	-4	.275
+7	.241			+7	.261		
+6	.227	+3	.227	+6	.247	+3	.247
+5	.213			-5	.233		
+4	.199	+2	.199	+4	.219	+2	.219
+3	.185			+3	.205		
+2	.172	+1	.172	+2	.191	-1	.191
+1	.157			+1	.177		
0	.143	0	.143	0	.163	0	.163
-1	.129			-1	.149		
-2	.116	-1	.116	-2	.135	-1	.135
-3	.102			-3	.121		
-4	.087	-2	.087	-4	.107	-2	.107
-5	.073			-5	.092		
-6	.059	-3	.059	-6	.079	-3	.079
-7	.045			-7	.065		
-8	.030	-4	.030	-8	.051	-4	.051
				-9	.037		

Driver Pins

New Keyway

Old Keyway (new diameter)				Old Key (old diameter)			
Standard Keying		System 70		Standard Keying		System 70	
1.	.227	1.	.227	1.	.191	1.	.191
2.	.213			2.	.177		
3.	.199	2.	.199	3.	.163	2.	.163
4.	.185			4.	.149		
5.	.172	3.	.172	5.	.135	3.	.135
6.	.157			6.	.121		
7.	.143	4.	.143	7.	.107	4.	.107
8.	.129			8.	.093		
9.	.116	5.	.116	9.	.079	5.	.079
0.	.102			0.	.065		
		6.	.087			6.	.051

Master Pins

All keyways – new and old

Standard Keying	System 70
2. .028	1. .028
3. .042	
4. .056	2. .056
5. .069	
6. .083	3. .083
7. .099	
8. .112	4. .112
9. .127	
	5. .140

Now we know the basic principles of master ring keying and are ready for more! Let's look at a system with multiple change and master keys. First group the master and change key together and write the bittings out on a chart. Second, master key the change keys conventionally. Third, figure the master ring pins by using the largest bitting of the master group compared to largest group for that position. The best method of explaining is to demonstrate.

	M.K. (1)	5	6	4	4	1	2
	M.K. (2)	5	6	4	4	2	2
	M.K. (3)	5	6	4	4	4	2
	C.K. (1)	4	2	4	2	3	4
	C.K. (2)	4	2	4	2	3	5
	C.K. (3)	4	2	4	2	3	6
	B.P.	4	2	4	2	3	4
(Master pin)	M.P.						1
	M.P.						1
	M.R.	+1	+4	0	-2	+1	-4
	M.P.					1	
	M.P.					2	
	D.P.	-1	-2	0	0	0	+2

Pin Kit

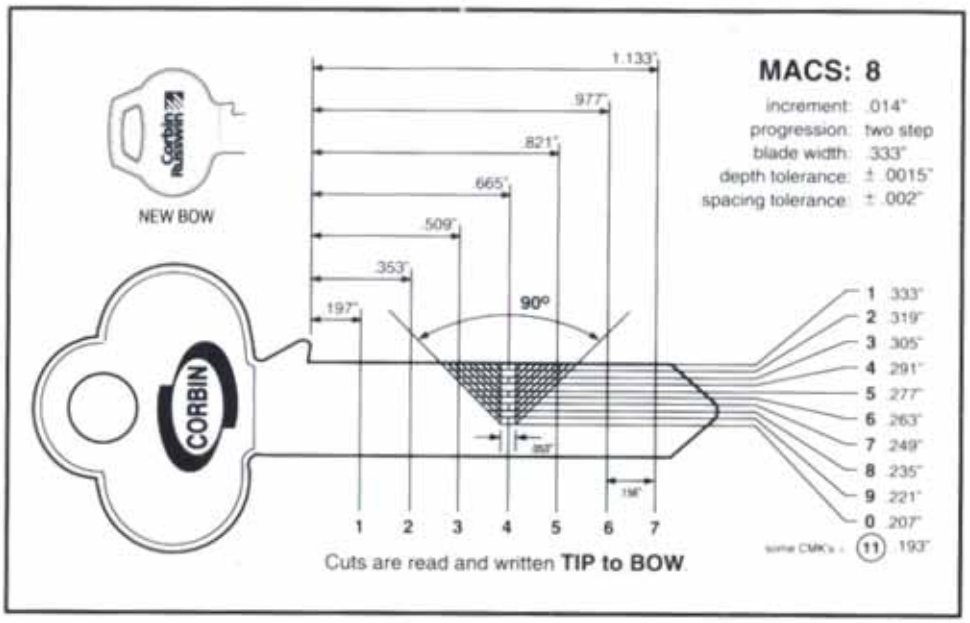
To successfully key a job, you will need a pin kit. A standard .005 pin kit does not work, also a standard .003 kit does not work have all the pins we will need, Emhart has a kit available, however, it has limitations.

Now to get a job keying the Master Ring Cylinder! Contact a local school, hospital, or other institution that has Corbin locks. Make an appointment to see the building engineer or locksmith, and ask if he needs help keying. Chances are he is very busy and would like the help. Also check with your local supply house. We have tried these avenues and found much success. We hope you do too!

This information taken from keying kit

X Class Keyways

Pre–System 70



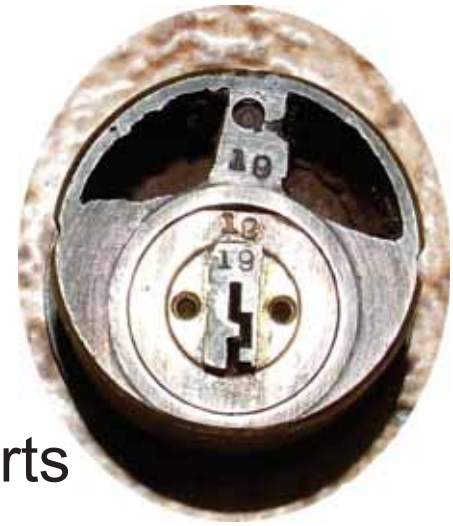
.509" Diameter Plug			Master Pins	.552" Diameter Plug	
Bottom Pins	Build–Up Pins	IC Top Pins		Bottom Pins	Build–Up Pins
1 .171"	–9 .037"	1 .192"	2 .028"	1 .213"	–8 .030"
2 .186"	–8 .051"	2 .177"	3 .042"	2 .228"	–7 .045"
3 .198"	–7 .066"	3 .163"	4 .056"	3 .241"	–6 .058"
4 .213"	–6 .080"	4 .149"	5 .070"	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"	For non–control chambers use .247"			+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"				

Corbin Master Ring Cylinder lock around 1889

4 Pin Cylinder plug

R&E maybe stand for Russell & Erwin

Cylinder Housing, Ring and plug are market to keep the correct parts together



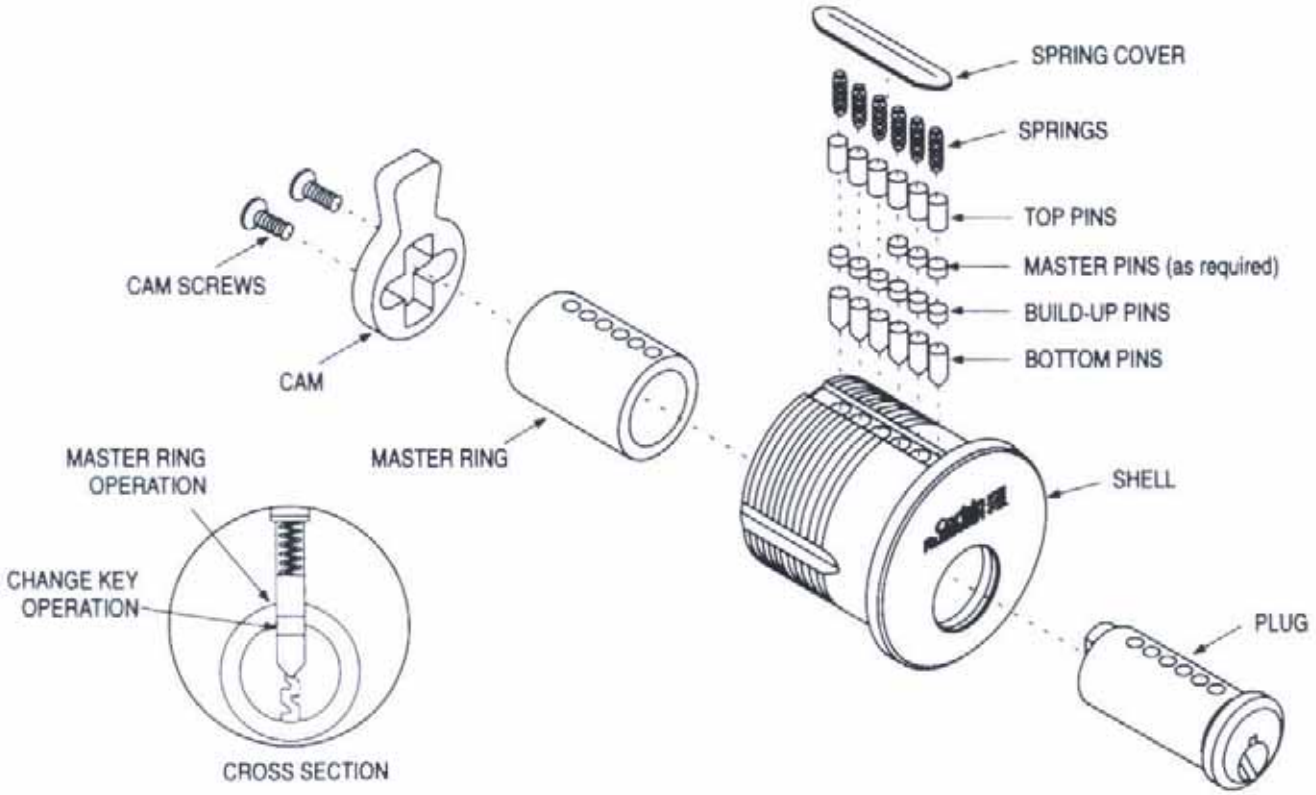
Markings on cam
Patented Nov 12 1889

Harvard name on top of edge plate

Corbin Master Ring Cylinder

After receiving the Corbin Master Ring Cylinder, in this case the cylinder was setup in “0” bitting. The uncut blank will fit the regular cylinder plug. To be able the key this type of cylinder to a Master system, the mortice cylinder needs to be disassembled. Remove the Spring Cover, remove the springs, top pins, which are .412” in length. Naturally they are not the correct top pins. They need to be replaced with Build-Up Pins and Master Pins plus the normal Top Pins.
The correct pin size is always .171”. The key way plug can be removed by using your regular follower. However the master ring can only be removed with removing all pins.

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.

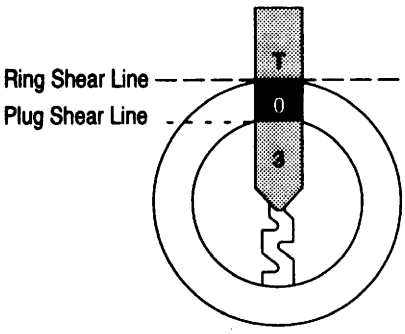
It is seldom possible to integrate single shear line cylinders into a master ring system after the fact. Doing so normally creates key interchange and/or places limitations on system expansion.

Combinating Master Ring

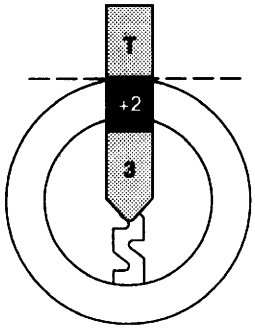
Master Ring Mechanics
Master ring cylinders are combinated similar to the control chambers of Corbin Russwin interchangeable cores. They require build-up pins with plus (+) and minus (–) values. This may seem unusual at first, but the process is very easy.

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.

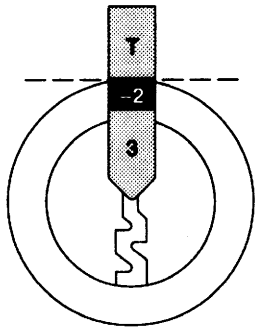
We will illustrate simple master keying first. There will be just a change key and one master key.



Master = 3
Change = 3



Master = 5
Change = 3



Master = 1
Change = 3

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 = (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 = (negative) 2.

As always, the top pin is .171".

Combinating Master Ring

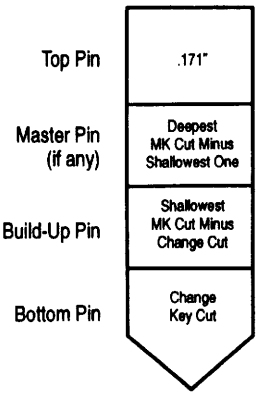
Grand Master Keying

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. Combinate 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.

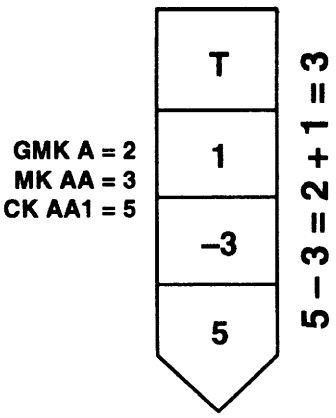
Beware of 0!

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.

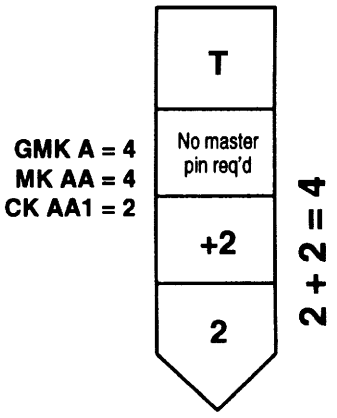
Example 1: When the shallowest master key cut is *shallower* than the change key cut, a "minus" build-up pin results: A = 2, AA = 3 and AA1 = 5. The build-up pin is -3 (GMK minus CK).

Shallower MK is Shallower than CK



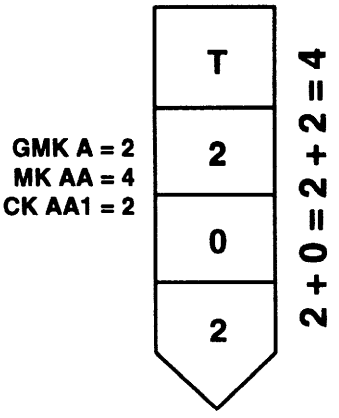
Example 2: When the shallowest master key is *deeper* than the change key, the difference is positive, so a +2 build-up pin is required. Both master keys are the same depth in this example, so no master pin is used.

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



Combinating Master Ring

The previous examples illustrate individual pin chambers. It is time to combinate 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 combinating 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
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
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 x 4 x 4 x 4 x 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 x 5 x 5 x 5 x 5 x 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.

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 bitting 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 Bitting 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:

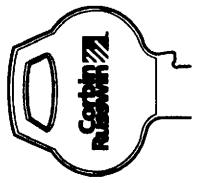
910011	910200	910411	910600	910811	912100	912311	912500	912711	912900
3	2	3	2	3	2	3	2	3	2
5	4	5	4	5	4	5	4	5	4
7	6	7	6	7	6	7	6	7	6
9	8	9	8	9	8	9	8	9	8
30	21	30	21	30	21	30	21	30	21
2	3	2	3	2	3	2	3	2	3
4	5	4	5	4	5	4	5	4	5
6	7	6	7	6	7	6	7	6	7
8	9	8	9	8	9	8	9	8	9
51	40	51	40	51	40	51	40	51	40
3	2	3	2	3	2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

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



NEW BOW

MACS: 8

increment: .014"
progression: two step
blade width: .333"
depth tolerance: ± .0015"
spacing tolerance: ± .002"

Cuts are read and written **TIP to 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	
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"	For non-control chambers use .247"					+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

InstaCode

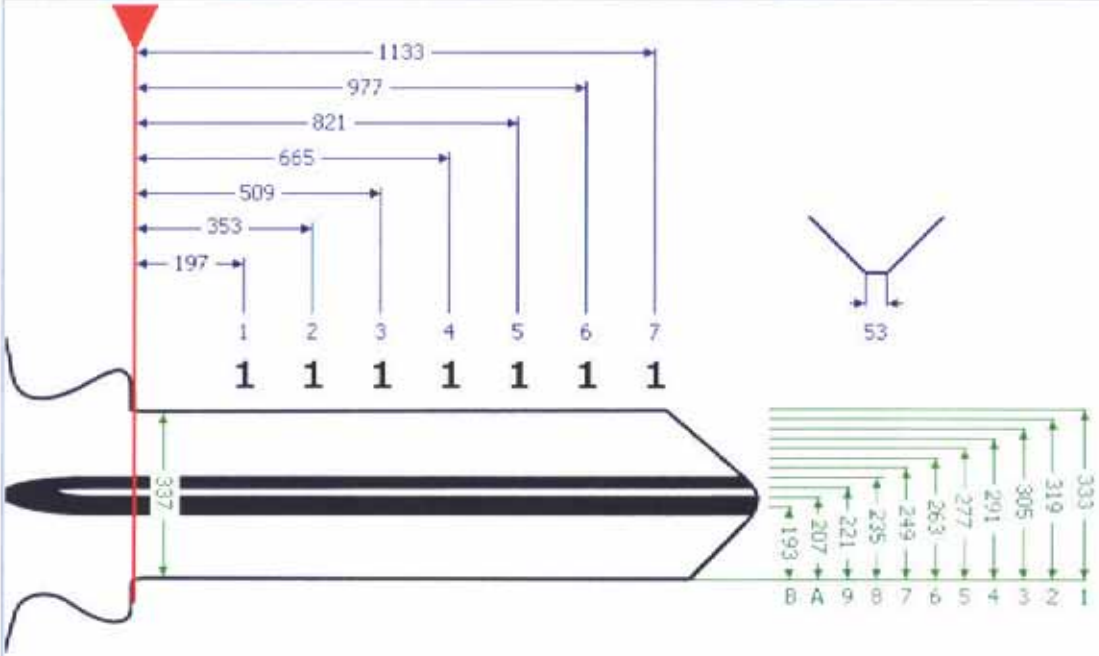
Search Tasks Tools Setup Help

Back | Series search | Key blank search | Identify key | New code... | New bitting... | Cut key...

ISN: 4388 Card: 958
Series: 123456789AB (Corbin X Class - Pre-System 70)

Manufacturer: Corbin
Code: **1111111**

Measurements diagram | Measurements | Notes etc



Key blanks

Corbin
- X1-27-5
- X1-27-6
- X1-67-5
- X1-77-5
- X1-77-6
- X1-99-6

Original
- X1-67A17

Alba
- E1
- E2
- E2L
- E9

Anis

There is no suitable machine configured or selected
Setup machines...

Hook:
Location:

start | ClickFree Backup | InstaCode | 8:54 AM