

Jake Jakubowski presents:

A Refresher Course of Basic Locksmithing

Copyright, 2008 by Jake Jakubowski, all rights reserved.

Kwikset Tylo Key-in-knob



Copyright, 2008 by Jake Jakubowski, all rights reserved.

Introduction



**Why a "basic"
refresher
course for
experienced
locksmiths?**

Copyright, 2008 by Jake Jakubowski, all rights reserved.

Because:

**No matter how good
we are, or think we are,
if we lose sight of the
basics...**

Copyright, 2008 by Jake Jakubowski, all rights reserved.

**We can
(and
do)
make
mis-
takes!**



Copyright, 2008 by Jake Jakubowski, all rights reserved.

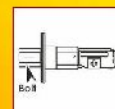


**By forgetting the
basics, we might
wind up calling a
latch a bolt, or a
bolt a latch.**



Dead Latch

Dead Bolt



Copyright, 2008 by Jake Jakubowski, all rights reserved.

*We might not remember what
the proper name of ...
the doohickey that causes the
thingamajig to turn the
whatizt that secures the
whirleygig that winds up the
moon!*

Copyright, 2008 by John Jalschowski, all rights reserved

*Okay...
so I'm having a little fun
with you ...
but you get the idea, right?*

Copyright, 2008 by John Jalschowski, all rights reserved



*If we lose sight of the basics,
we might develop bad habits,
and terminology that are not
conducive to good lock-
smithing.*

"So, what?" you ask



*This is what: we might pass those undesirable
traits and poor nomenclature on to our
employees , apprentices and customers!*

Copyright, 2008 by John Jalschowski, all rights reserved



*There are some
jobs where a
worker can
repeat their first day's until
they retire!*

*Locksmithing is not one
of those jobs!*

Copyright, 2008 by John Jalschowski, all rights reserved

*If we remain 'static' in our
careers, that means we do
not progress ...*

*Yet, we cannot progress
unless we have, and
maintain a thorough grasp
of the basics of our trade.*

Copyright, 2008 by John Jalschowski, all rights reserved

*That's true whether:
You're a one person mobile
business.*

*An employee for a large
commercial shop.*

*Or, an institutional, or "in-
house" locksmith.*

Copyright, 2008 by John Jalschowski, all rights reserved

Basics are important because:

*“Any technology that is sufficiently advanced is **Black Magic** to the uninitiated”* ...Anonymous

Copyright, 2008 by John J. Jachowicz, all rights reserved

What is A Lock?

“Any device which prevents access or use by requiring special knowledge or equipment .”

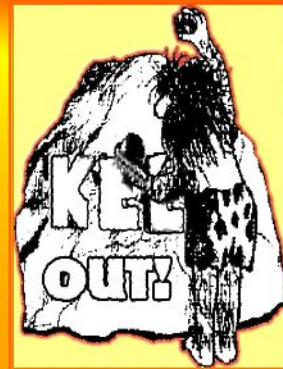
—The List Council

Copyright, 2008 by John Jachowicz, all rights reserved



Copyright, 2008 by John Jachowicz, all rights reserved

Mankind's first attempts at security may very well have been a large rock rolled in front of a cave's entrance.

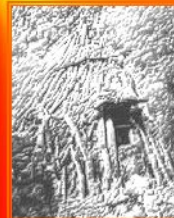


Copyright, 2008 by John Jachowicz, all rights reserved



Or, maybe our forebears sought shelter under a rocky overhang and piled brush in front of it as protection from the weather and intruders...

Copyright, 2008 by John Jachowicz, all rights reserved



From sticks and mud and animal skins...

...to stones piled one, on top, the other .



Copyright, 2008 by John Jachowicz, all rights reserved

Our ancestors built more and more complicated shelters to protect them, their families and their belongings from predators, mothers-in-law and things that go bump in the night.

Copyright, 2008 by John Jankowski, all rights reserved



Until they finally began building temples, palaces, homes and government buildings that actually had “real” doors on them that required “locks” to secure them.

Copyright, 2008 by John Jankowski, all rights reserved

In the ruins of the ancient Temple of Karnak, in the Palace of Sargon



the oldest lock, known to man, was discovered in the 1800's.

Copyright, 2008 by John Jankowski, all rights reserved



***The
“Egyptian
Lock”***

Copyright, 2008 by John Jankowski, all rights reserved

The “Egyptian Lock” was about 4,000 years old. Even today, there are similar locks in use in the Faroe Islands.

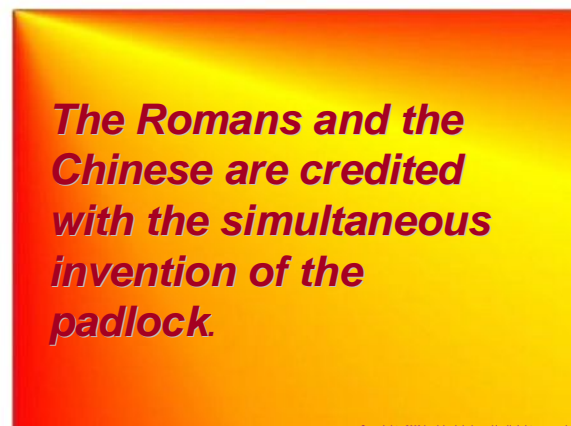
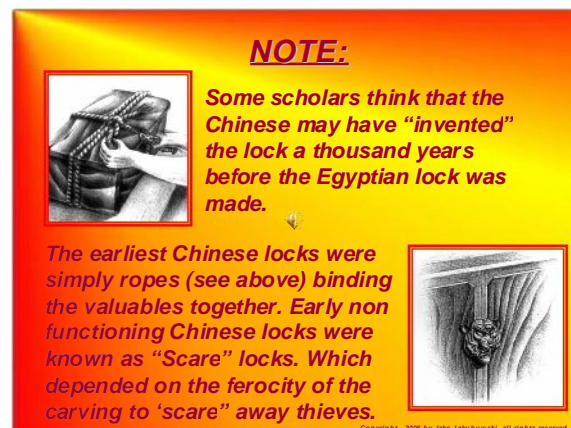
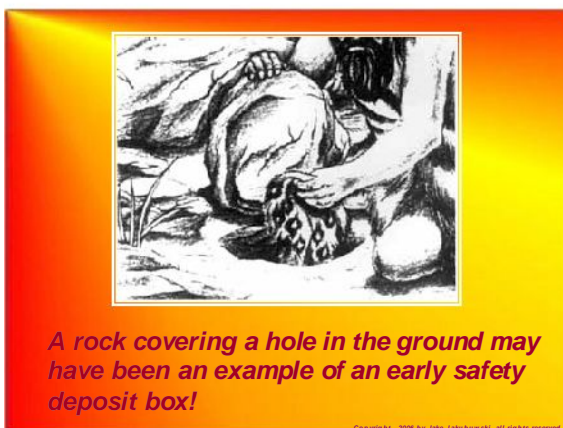
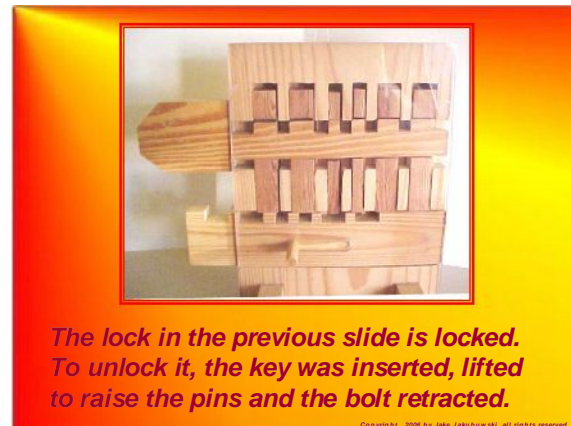


Copyright, 2008 by John Jankowski, all rights reserved

In fact, wooden locks working on the same principle as the Egyptian Lock and the Faro Island lock have been found around the world.

The lock in the following slide is a recreation of a type lock used in North Carolina up until the early 20th century.

Copyright, 2008 by John Jankowski, all rights reserved





**A Roman
"Face Lock"
Padlock**

**A Roman
"Barbed
Spring"
Padlock**

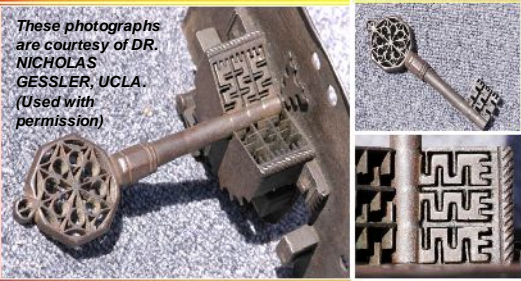


An example of a Chinese "Spring" Padlock from the Han Dynasty (206 BC to 220 AD). Note the similarities between it and the Roman Barbed Spring Padlock.

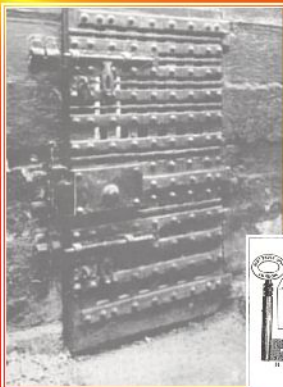


For a thousand years or more, complicated "warding" was the security preference of lock makers. Here is a prime example of a "secure" 15th or 16th century warded lock. Great workmanship but little security.

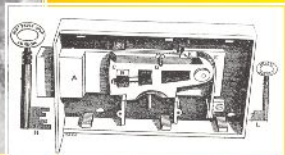
These photographs are courtesy of DR. NICHOLAS GESSLER, UCLA. (Used with permission)



The "Fathers" of The Modern Lock



In 1780, a Clerksell locksmith named Gabriel Vardon, was supposed to have developed the predecessor of this Chubb Lever Lock shown on a door to "Old Newgate Prison".



1778: Robert Barron invents his "Double Acting Tumbler Lock."

1784: Joseph Bramah patented his "Safety Lock" in London.

1848: Linus Yale, Sr. "invents" the Pin Tumbler Lock.

1857: James Sargent invents the world's first key-changeable combination lock.
1861: Linus Yale, Jr. develops pin tumbler lock and , and later, the paracentric keyway.
1862: Linus Yale, Jr. invents the first "modern" padlock.

Copyright, 2008 by John Jalschowski, all rights reserved

1889: Samuel Redsecker Slaymaker begins manufacturing padlocks in "Arch's Alley". In the early 20's he sold F. W. Woolworth on the idea of putting Slaymaker locks in his first store in Lancaster, PA.

Copyright, 2008 by John Jalschowski, all rights reserved

1916: Samuel Segal invented his "Jimmy Proof Lock."

1921: Harry Soref founded the Master Lock Company. His "layered" padlock was patented in 1924.

Copyright, 2008 by John Jalschowski, all rights reserved

**Any
Questions?**

Copyright, 2008 by John Jalschowski, all rights reserved

**Types
of
Locks**

Copyright, 2008 by John Jalschowski, all rights reserved

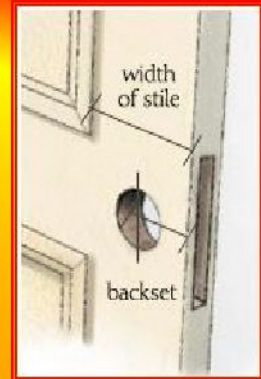
Locks are like flowers ... there is, seemingly, an endless variety.

Mortise, Rim, Key-in-Knob, Cam, Padlocks, Combination Locks, Mechanical and Electro-mechanical, Magnetic, Digital, Keyed, Passage function, Privacy, Levers and more.....

Copyright, 2008 by John Jalschowski, all rights reserved



Mortise locks come in all shapes and sizes. Some are electrified ... some are not. All have one thing in common ... regardless of their application and that is they require a "full mortise prep on the door to accommodate the lock.



This is a very common style of mortise lock and was almost universal in its usage. This type of mortise lock can still be found and are available from a number of suppliers.



The key through the bolt. The latch remained "free".

The mechanism (or "innards") is typical of this type of lock. A spring latch to open and close the door and a "bolt" to lock the door.



This mortise lock with a barrel key is typically found in furniture and cabinet applications.

This Sargent 9800 series mortise lock is easily field "handed". That is, with a quick "flip" of the latch bolt the lock can be RH or LH.



A Schlage Electrified Mortise Lock.



A Securatec Full Mortise Lock with Multi-point locking. A three point locking system.



A Sargent 9900 series full mortise with panic exit hardware.

This is a full mortise Multi-Lock with out side escutcheon and knob trim. Multi-Lock is considered a high security lock.



Copyright, 2008 by John J. Jankowski, all rights reserved

A Medeco full Mortise Lock with elegant trim of residential or up scale commercial use.



Brawn and beauty!

Copyright, 2008 by John J. Jankowski, all rights reserved



Deadlocking Hook Bolt

Dead Bolt

Here's a type of mortise lock that we are all familiar with ...

The "MS" series deadbolt, developed by Adams-Rite

Copyright, 2008 by John J. Jankowski, all rights reserved

Throughout your career you will be called upon to repair and service the mortise lock itself. Most often, you are going to be called upon to "rekey" the mortise cylinder on that lock.

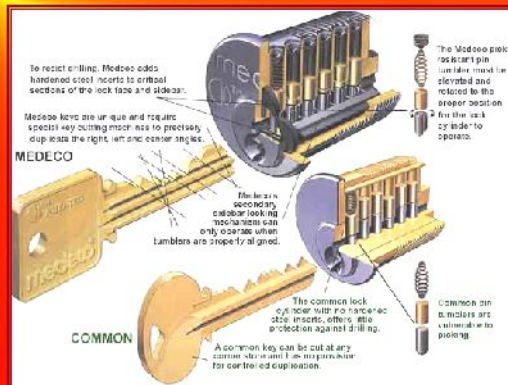
Mortise cylinders are the cylinders that screw into the lock body and by means of a key to turn the plug and a "tailpiece" on the back of the plug will either lock or unlock the mortise lock.

Copyright, 2008 by John J. Jankowski, all rights reserved

In the next slide, I'm going to compare a high security (Medeco) mortise cylinder with a "regular" mortise cylinder.

In other slides, I will show you various mortise cylinders. High security and otherwise.

Copyright, 2008 by John J. Jankowski, all rights reserved



Copyright, 2008 by John J. Jankowski, all rights reserved



Copyright, 2008 by John Jachowicki, all rights reserved

The most common lengths for mortise cylinders is 1" and 1-1/8". There are other sizes available, if and, when needed.

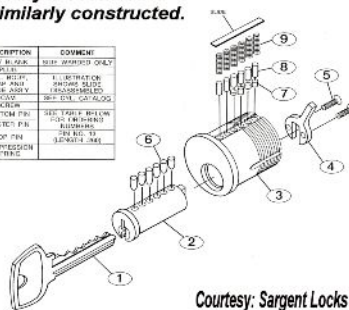
Mortise cylinders are available in all the popular finishes.

Mortise cylinders are available as non-restricted and restricted and high security models.

Copyright, 2008 by John Jachowicki, all rights reserved

Although this is a Sargent mortise cylinder, typically most mortise cylinders are similarly constructed.

ITEM	ORDERING NUMBER	DESCRIPTION	COMMENT
1	62-21A	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
2	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
3	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
4	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
5	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
6	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
7	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
8	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"
9	10-240	KEY B-42A	MIN. 1/8" X 1/4" X 1/4"



Courtesy: Sargent Locks

Copyright, 2008 by John Jachowicki, all rights reserved



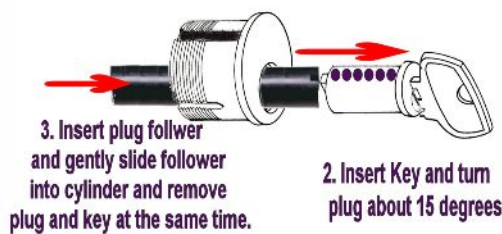
Before trying to repin a lock, make sure you have a good set of followers and a good pair of tweezers.

LAB makes both and I highly recommend them. These great tools are available through your favorite distributor...



Copyright, 2008 by John Jachowicki, all rights reserved

1. Remove Screws and Tailpiece

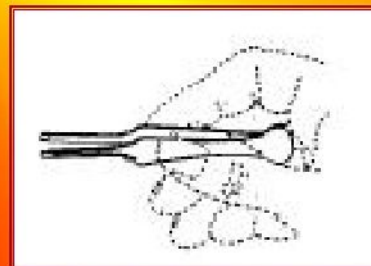


3. Insert plug follower and gently slide follower into cylinder and remove plug and key at the same time.

2. Insert Key and turn plug about 15 degrees

Copyright, 2008 by John Jachowicki, all rights reserved

Always use tweezers when loading a plug!



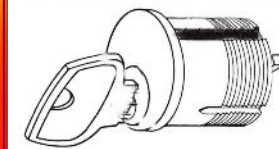
Why?

Copyright, 2008 by John Jachowicki, all rights reserved



Photograph courtesy of Jeff Clinton, Old Saybrook, CT.

Copyright, 2008 by John Jankowski, all rights reserved



Reassemble Cylinder



Copyright, 2008 by John Jankowski, all rights reserved

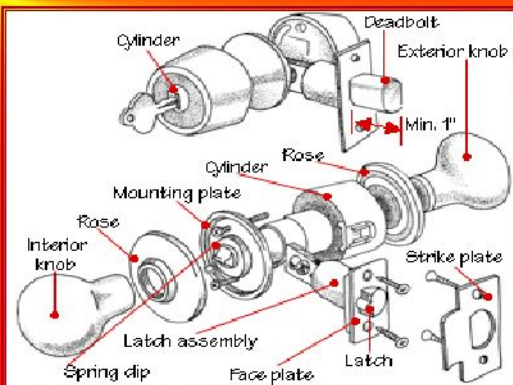
Cylindrical Locks

Cylindrical (161 Prep) locks are any type of lock that fit in a circular prep (as opposed to a mortise) in the door. These locks are sometimes called "Bored Locks".

Copyright, 2008 by John Jankowski, all rights reserved

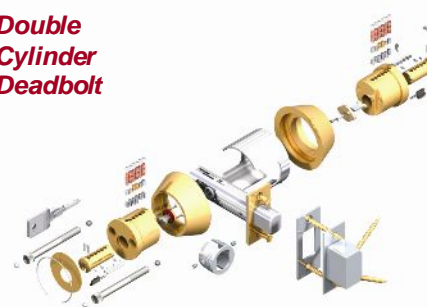
The following chart will help you identify the most common parts of a cylindrical lock.

Copyright, 2008 by John Jankowski, all rights reserved



Copyright, 2008 by John Jankowski, all rights reserved

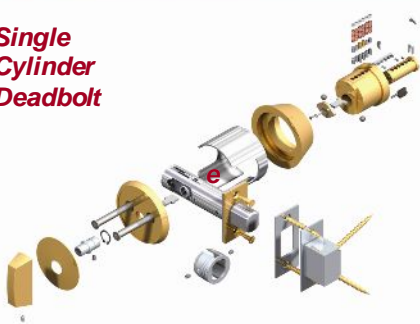
Double Cylinder Deadbolt



Courtesy: Medeco

Copyright, 2008 by John Jankowski, all rights reserved

Single Cylinder Deadbolt



Courtesy: Medeco

Copyright, 2008 by John Jalschowski, all rights reserved

Key-in-Knob Cylindrical Knob set.



Courtesy: Medeco

Copyright, 2008 by John Jalschowski, all rights reserved

Key-in-Lever Cylindrical lever set.



Courtesy: Medeco

Copyright, 2008 by John Jalschowski, all rights reserved

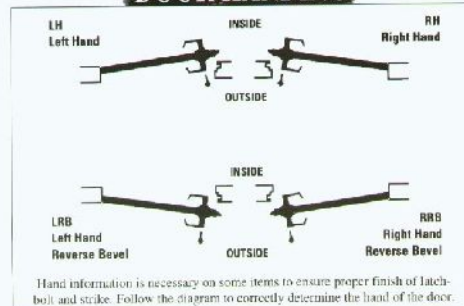


Copyright, 2008 by John Jalschowski, all rights reserved

For the most part, cylindrical hardware is non-handed. Variations from some manufacturers are handed locks. The chart in the next slide will help you to determine the hand of a door.

Copyright, 2008 by John Jalschowski, all rights reserved

DOOR HANDING



Copyright, 2008 by John Jalschowski, all rights reserved

Cross Bore

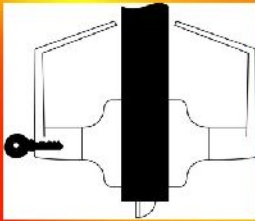
The diameter of the hole for the lock body.
The standard bore is 2-1/8 inches. Many older doors had bores that could have been smaller. Most of the current locks require the standard 2-1/8 inch bore. When replacing locks on doors that have smaller diameter holes there are two options. Either re-cut the cross bore or find a lock company (Weiser/Schlage/National) that might still make locks for that smaller cross bore.

Copyright, 2008 by John J. Jankowski, all rights reserved

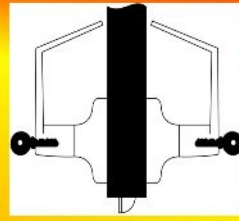
Lock Functions

The following slides will give show you the various lock functions.

Copyright, 2008 by John Jankowski, all rights reserved

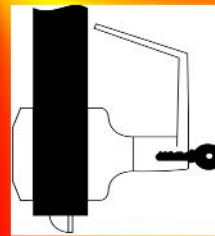


CLASSROOM: Locks and unlocks only with a key from the outside

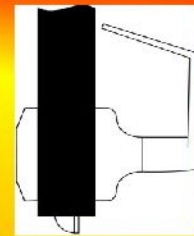


COMMUNICATING OR INSTITUTIONAL: Always locked needs key to unlock from either side.

Copyright, 2008 by John Jankowski, all rights reserved

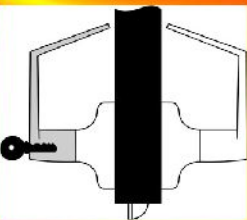


COMMUNICATING: Always locked with blank on one side, key on other.

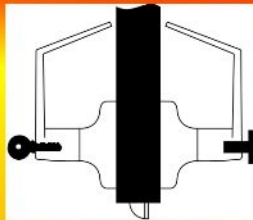


EXIT FUNCTION ONLY: Never locked on inside. Blank plate on outside.

Copyright, 2008 by John Jankowski, all rights reserved

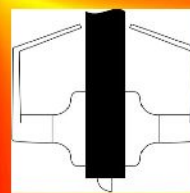


STOREROOM FUNCTION: Outside always locked. Inside always free. Need key for entry.

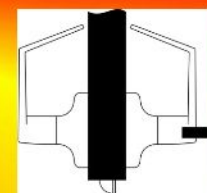


ENTRANCE FUNCTION: Key can lock and unlock from outside. Inside always free but button can lock outside.

Copyright, 2008 by John Jankowski, all rights reserved



PASSAGE FUNCTION: Both sides always free.



PATIO FUNCTION: Outside locked and unlocked by inside button.

NOTE: If the Patio Function lock had a "poke hole" for outside unlocking, it would be a Privacy Lock.

Copyright, 2008 by John Jankowski, all rights reserved

Edge Bore

The diameter of the hole for the latch or deadbolt and is the hole that is cut from the edge of the door to the cross bore. Generally speaking; this hole is 1" in diameter.

Copyright, 2008 by John J. Jankowski, all rights reserved

Backset

The distance from the edge of the door to the center of the lock bore. Two standard back-sets are 2-3/8 and 2-3/4 inches other back sets (including 2-inch) used by National and Loric Lock and 5 inch used by Weiser, Weslock, Kwikset and others are also available. There are also extensions for some brands like Schlage, that can extend the latch enough to have the lock located in the center of the door. When replacing locks the latch backset needs to match the holes bored in the door.

Copyright, 2008 by John J. Jankowski, all rights reserved

Lock Spacing

The distance between two locks. When preping for deadbolt locks in a door, there are two standards for spacing between the bottom lock and the deadbolt. The two most common are 5-1/2 and 6 Inches from the center of the two holes. There are other combinations of spacing which are used on specialty locks, however: when adding a deadbolt lock your best choice would be something standard.

Copyright, 2008 by John J. Jankowski, all rights reserved

Note:

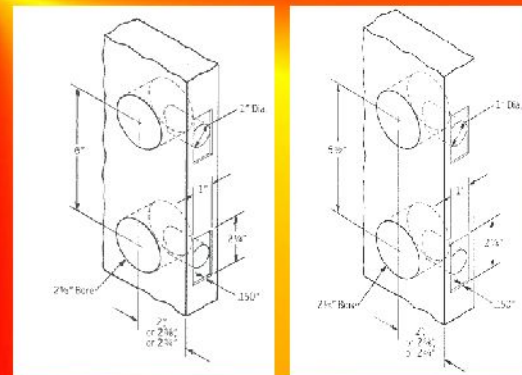
The majority of residential locksets will have a back set of 2-3/8". Less commonly, you will find 2" or 3" back sets.

For the most part commercial and industrial locksets will have a back set of 2-3/4" with occasional variations.

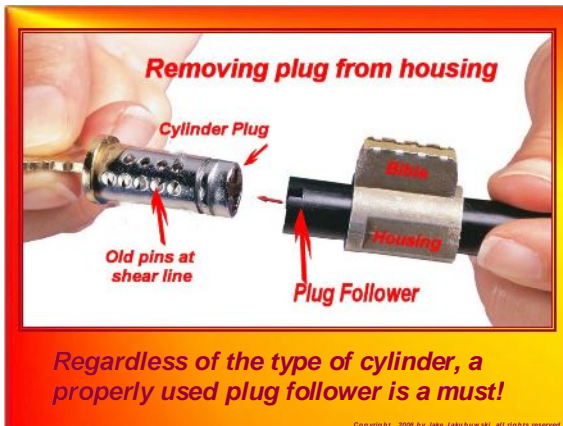
Copyright, 2008 by John J. Jankowski, all rights reserved

The most common DOOR thickness will be 1-3/4". Variations will be found depending on age and application.

Copyright, 2008 by John J. Jankowski, all rights reserved



Copyright, 2008 by John J. Jankowski, all rights reserved



Basic Rekeying

Which is changing the combination of the pins and the bittings of the keys to render the old lock immune from an unauthorized entry by an ex-employee of some one else that has a key.

When the cylinder is rekeyed, the old key will no longer work and new keys have to be issued to the authorized keyholders.

Copyright, 2008 by John J. Jankowski, all rights reserved






The RYTAN tool will make short work of KW cylinder removal!

Copyright, 2008 by John Jalschowski, all rights reserved



A-1's QuikPull 1 Great Tool!

Copyright, 2008 by John Jalschowski, all rights reserved



Cylinder Removed from Housing

Use Kwikset tool to push our plug retainer clip.

Arrow -- to the right -- points to loosened clip.


Copyright, 2008 by John Jalschowski, all rights reserved



With clip removed and working key inserted, begin using follower to ...


gently push the plug out of the cylinder housing.

Copyright, 2008 by John Jalschowski, all rights reserved



Rekey as indicated. Check key in plug.

Copyright, 2008 by John Jalschowski, all rights reserved



Carefully feed plug into cylinder.

After plug is in cylinder, remove key, being sure not to pull the plug out of the cylinder

Replace clip

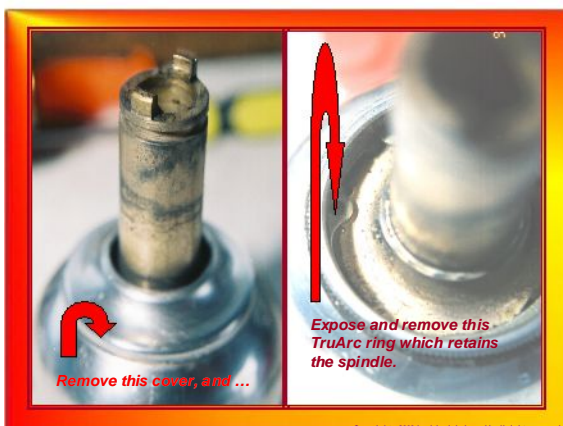
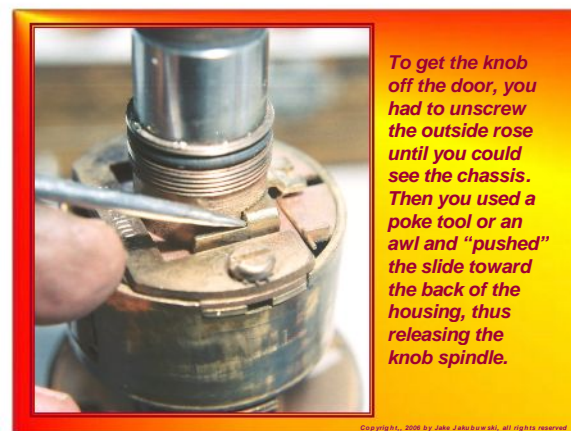
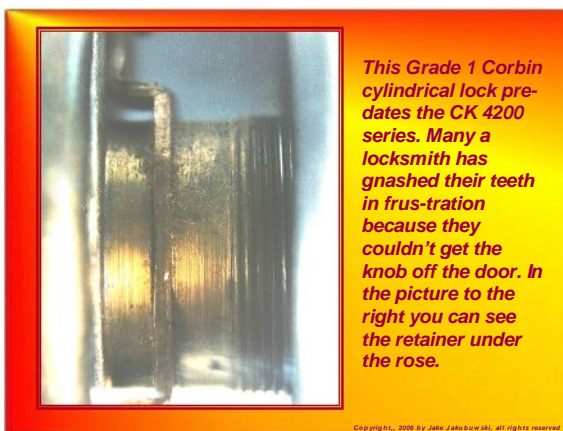
Copyright, 2008 by John Jalschowski, all rights reserved

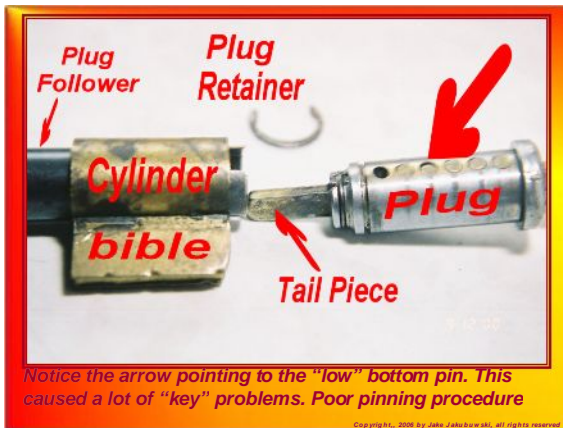


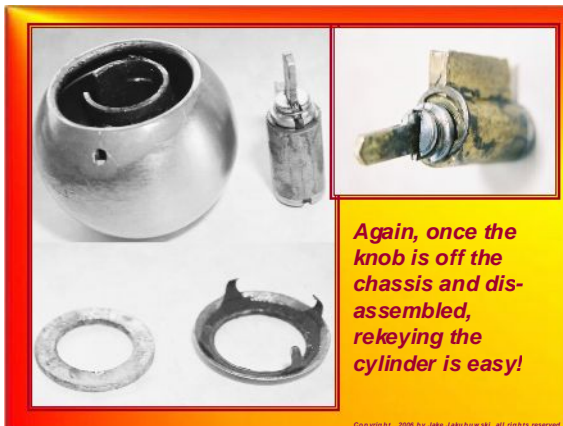
Have you ever had a Corbin/Russwin that you could just not figure how to get it off of the door?

Well, here's three different Corbins you will encounter in your travels!

Copyright, 2008 by John Jalschowski, all rights reserved

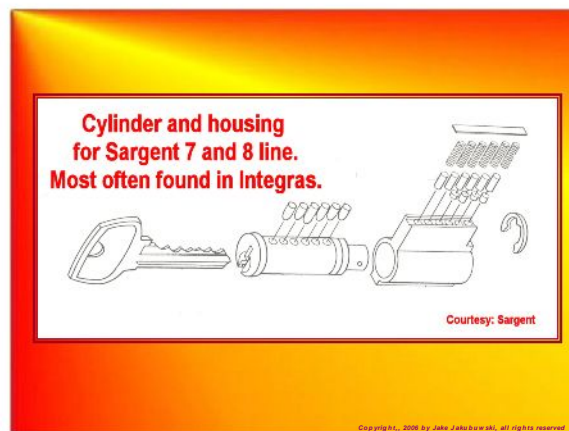


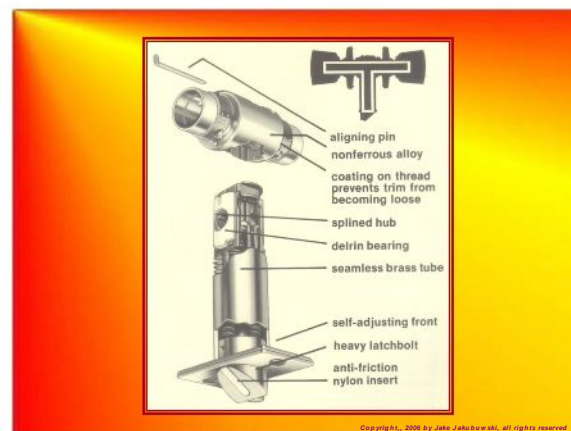
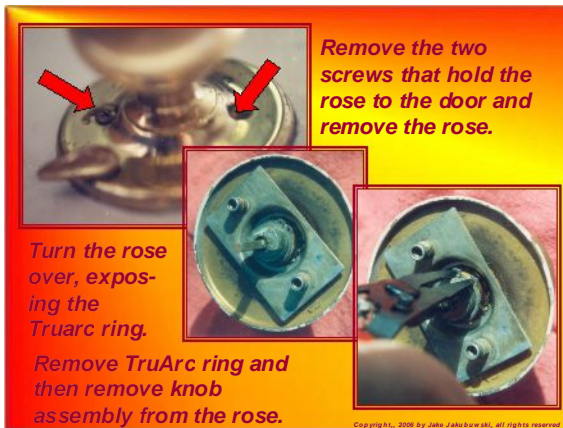


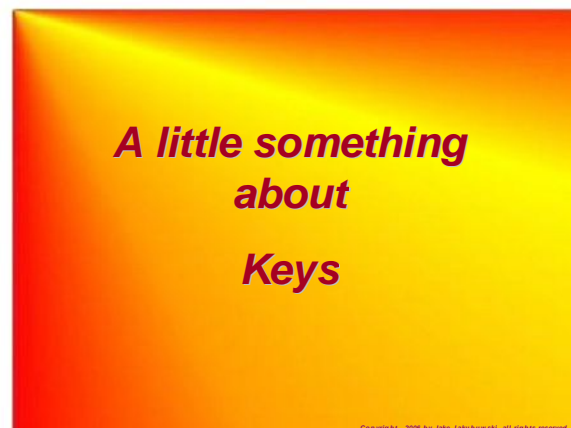
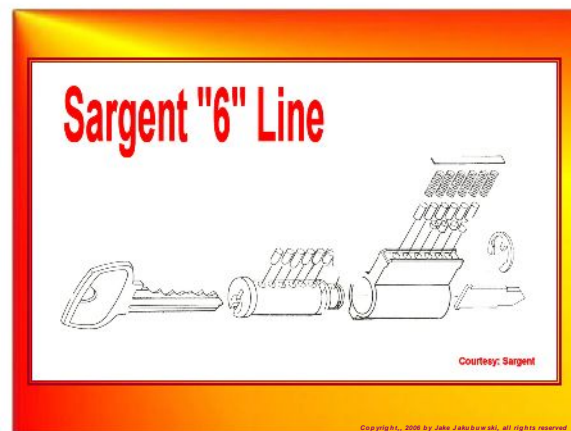




**How
About
Some
Sargent?**







Aside from knowing how to rekey a lock, being able to identify keys and keyways is one of the skills you need to work on and practice.



Skeleton Keys



Detention Key



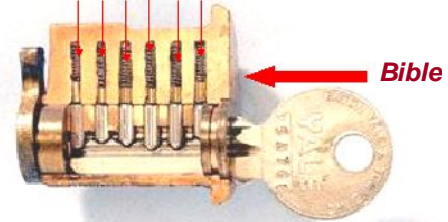
Tubular Keys



We also need a grasp of why keys work and how they work...

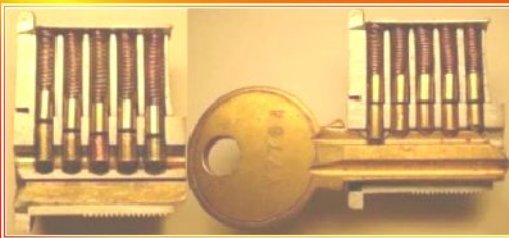
Copyright, 2008 by John J. Jankowski, all rights reserved

Chambers inside of Bible



Shows pins aligned with the Shear Line. That alignment is what allows the plug to turn when the key is rotated.

Copyright, 2008 by John Jankowski, all rights reserved



The cylinder to the left has an improper key inserted. Pins cross the shear line. Cylinder on the right, has the proper key inserted: Pins align at shear line.

Copyright, 2008 by John Jankowski, all rights reserved

This is not the end, but the beginning. There are dozens of locks, locking mechanisms, key cutting machinery and a hundred other things that I did not cover here because of the time constraints. That's all grist for other mills.

Copyright, 2008 by John Jankowski, all rights reserved