PICKING PIN TUMBLER LOCKS pdf

1: Lock Picking: Rekeying and Creating Master Keys | HowStuffWorks

The pin tumbler lock makes up about 90% of locks used today and is what you will find on about every deadbolt, door lock, and padlock. They are extremely simple in their design and essentially 6,year-old technology.

Whether it is a deadbolt, door knob, or padlock, the most common type of lock uses this type of mechanical setup. If you already know how a pin tumbler lock works from the various articles I have written or for some other resource , then feel free to move on to the next section. But without any knowledge of how a lock functions, it is unlikely that you will be able to manipulate the lock effectively. For effective lock picking, know how the lock works. The Bible Sometimes referred to as the lock housing or the book, the bible of a lock remains stationary during the use of a key. The reason it will be referred to as the bible is mainly due to preference, and because it is a term that is difficult to confuse or conflate with other parts of the lock. When the proper key is inserted into the lock or lock picking is successful , the springs and driver pins will pass the shear line and be in the bible exclusively. So for clarity, this part of the lock will be known as the plug for the purposes of this article. The plug is solely the cylindrical length of metal that rotates within the bible of the lock, once the key is inserted. You can easily distinguish the plug of the lock because it has the keyway. You insert your key, or lock pick, into the plug to interact with the pins. When the plug can rotate, the lock can open. This rotation means that the key pins are in the plug below the shear line. The Pin Chambers Milled into the bible and plug are long, interconnecting, holes. These holes are filled with pins we will talk about the pins more down below. The pins are stacked with a spring resting in the bible, exerting pressure on the stack of pins. The pin chambers of the bible line up with those in the plug. This allows the bible to be connected to the plug. As long as the pins remain overlapping in the plug and the bible through the pin chambers, the plug cannot rotate, and the lock cannot open. The Shear Line In order for the plug to be able to rotate within the bible of the lock, there needs to be space between the two parts. This gap is referred to as the shear line. If anything blocks the shear line, then the lock will not open. For the lock to open, the pin stacks need to divide at the shear line. Nothing can extend past the shear line from the plug into the bible. Make sure that pins are above and below the shear line, and that nothing is getting hung up there. Lock picking when there are security pins will get more complicated because pins will bind at the shear line and not above or below. The Key Pins When you are inserting a key or lock picking, the pins that your tools will interact with are the key pins. The key pins will have different heights. After the lock picking is successful, or the proper key is inserted, the key pins will remain in the plug. The Driver Pins Driver pins are bookended by the springs on one side and the key pins on the other. Unlike the key pins, driver pins do not have a pointed end. They are commonly flat on both ends and will have a uniform height for each lock manufacturer. While lock picking, the driver pins will not come into direct contact with the picks. The driver pins are manipulated by lifting the key pins. When the lock is picked, the driver pins will be in the bible along with the springs. The Springs Every pin stack needs spring tension in order to keep the pins from being free moving. The pressure downward or upward, depending on lock orientation exerted by the springs can differ, even within the same lock. You can tell a pin has set on the right side of the shear line when you no longer feel spring tension on the pin of that chamber. The spring must compress and rest in the bible for the plug to rotate and the lock to open. How a Key Works In a Lock All of the components of a lock work together so that they only open with the right key. The idea is that one key opens one lock, but not another. This is because of how the key works. You insert the proper key for a lock into the keyhole. The key pins which are different sizes are raised by the grooves on the key. Both the key grooves and the key pins correspond so that even with the pin stacks having different sizes, they are all elevated to the shear line. When the wrong key is inserted, a low cut on a key might not elevate the pin stack high enough for the driver pin to clear the shear line. A key groove that is too high, might elevate the pin stack so that the key pin is moved to block the shear line. Once the pins are on their respective sides of the shear line, there is a gap that allows the plug to turn. You can then turn the key, and the plug will rotate. The rotation of the plug moves a cam or tail piece that retracts a bolt or locking pawl. The lock is then open. Basics of Manipulation Image Source I like to say that lock picking works a little like a key in slow motion, and with the

sequence of events jumbled up. For example, you start with adding a bit of turning pressure to the plug. This puts tension on the pin stacks, which you will feel released as the lock is picked. You need to move each pin stack so that the driver pin gets stuck on the bible side of the shear line. This is the slow motion part of the lock picking process. Where one insert of the proper key would align the pin stacks, now you need several inserts and some deft movement of the lock pick. We will get more into this later, but it is important that you understand that lock picking works by tensioning and manipulating the pin stacks similar to how a key would open the door. This is the essential premise of lock picking. Lock chambers have to be milled into the metal and rarely end up in a perfectly straight line or with the exact diameter as each other. This means that some of the chambers lean more toward the right or left. When you apply rotational tension to the plug, you can find the binding order of the pin stacks, by feeling for resistance. That resistance is the pin stack grinding against the metal of the pin chamber, meaning it is ready to set. The springy pin stacks do not have resistance because their pin chambers align farther off from the direction of rotational pressure. As the plug turns, the driver pin is given a ledge to rest on, so that the spring tension will not send it back into the plug. Although you should not worry about picking security pins right out of the gate, it is important to know what they are, in case you do encounter them. Security pins are driver pins, and even key pins, that are cut into shapes that have them catch at the shear line. This effectively jams the lock, as something is stuck between the boundary of the bible and the plug. However, there will be no spring tension, as the ledge meant to keep the driver pin on one side of the shear line is keeping the security stuck in place. This still makes the pin stack feel as though it is not under spring tension, leading to confusion as to why the lock is not picked. Lock Picking Tools Lock picking requires particular tools for the job. As you already know, the basics of lock manipulation are that the plug must be tensioned and that the pins must be moved within the keyway. For more particular guidance as to what items you need in your first lock pick set , you can take a look at one of our past articles. But here are the basic tools you need in order to start lock picking. Tension Wrench Tension tools come in a variety of shapes, sizes, and profiles. It is important to have a tension wrench you can insert into the keyway without blocking the pins. You also need the tension tool not to slip in the keyway. If you lose tension, you undo all of the lock picking you had done. Rake This will be the choice tool for how to pick locks the simple way. A rake works on the idea of moving all of the pins randomly and moving them fast. They are designed to give the best odds for opening a lock by chance. Hook Hooks can be standard, offset, and come in many different sizes and thicknesses. They can be used to try and open the lock the simple way, but are more often used for the method of how to pick locks the hard way. With a hook, you are looking to find something that can move well in the keyway. It needs to be able to access the pins in a way that allows each stack to be leveraged. With hooks, you are looking to get the greatest range of motion while lock picking. Each has their upsides and pitfalls. But no matter if money, supplies, machining resources, etc. Buying If you are willing to spend the money, you can save time and effort. But beyond those considerations, you will also take away some of the guesswork as to the quality you may receive. As long as you buy your lock picks from the right company , you can know what to expect. Though you might need to polish the tools or do some cleanup work, there are brands that can give you what you need to start lock picking straight out of the package. Making Your Own Lock picks are just pieces of thin metal that are cut to a particular shape. You can get the most popular lock pick profiles, and use those templates to fabricate your own lock picks. It will take the most amount of time, but you have the chance of getting something of higher-quality, greater uniqueness, and for less money than if you bought lock picks online. Improvised In a tight spot, you can use bobby pins or paper clips to fashion improvised lock picks. These types of lock pick tools have the greatest chance of not being effective. Where you might get dimensions wrong when making your own picks, improvised picks settle for what you can get. Often improvised picks are for people just looking to test out the lock picking hobby.

PICKING PIN TUMBLER LOCKS pdf

2: An Introduction to Lock Picking: How to Pick Pin Tumbler Locks

Buy yourself different pin and tumbler locks at the hardware store and keep them on your desk or by your couch. When you're taking a break from work or while you're watching TV, practice picking. I've got three or four locks in my drawer that I'll bust out during the day for practice sessions.

These notes are intended primarily for students in my security seminar; a few of the references here are locally specific and may be confusing to others. Most of the content, however, is generic, and security researchers and practitioners, students of locksmithing, surreptitious entry specialists, and others with an interest in this subject may find it helpful, especially in conjunction with other resources. Mechanical locks and techniques for defeating them are inherently interesting to many scientists, engineers, and others, and an understanding of the principles for evaluating and techniques for attacking locks, in addition to being useful in its own right, can provide subtle insight into security more generally. Pin-tumbler lock picking has long been among the common skills of the security community. The first step toward learning to defeat locks is a thorough understanding of how they work, where their security comes from, and how their design and manufacture introduces potentially exploitable vulnerabilities. A detailed introduction to locks is well beyond the scope of this document; we assume here that you already understand, or have access to, the basic principles. This is intended only as a supplemental, practical guide. Many of the principles can be applied to other keyed lock types, although sometimes the techniques and tools must be adapted. Some pin tumbler locks incorporate "high security" features, including secondary locking mechanisms and features intended specifically to frustrate picking. While some of these features can be defeated with conventional picking tools and are covered here, picking high security locks generally requires specialized tools and techniques often designed for a specific brand or model of lock and are beyond our scope here. There has been quite a bit written, on the Internet and in print, about lock picking. While some of the literature of this subject is quite good, much of it is amateurish, apparently written to appeal to an "underground" audience and not especially rigorous or complete. Some of it is just factually wrong, or obviously based only on speculation. It is aimed at locksmith practitioners but has a cogent discussion of principles as well as technique. If you can find a copy for sale, get it. Some of the approach in this document is influenced by that of the Finch book. An excellent and currently available reference is Marc W. The book is an encyclopedic guide to mechanical locks, how to evaluate them, and how to defeat them, aimed primarily at investigators, law enforcement and intelligence operatives. It is a worthwhile investment for anyone with a serious interest in the subject, and repays careful study. For those unfortunate neo-anti-Luddites who refuse to acknowledge the value of anything not available on the Web, I suggest, at a minimum, reading the MIT Guide to Lockpicking, which, while not perfect, has the virtue of being free and readily available online. A word of warning however: But the MIT Guide does cover most of the basics and is a quick read. What is Lock Picking? Although somewhat romanticized by popular media and culture, in reality the significance of lock picking is usually dwarfed by other, more practical threats. Other classes of attack, not discussed here but at least as worthy of study and scrutiny, include lock decoding, which is concerned with producing a working key based only on access to the external interface of the lock, lock bypass, which aims to unlatch the underlying locking mechanism without operating the lock at all, and forced entry, which, as the term suggests, involves the destructive application of force to the lock or its surroundings. And of course there is the surest and fastest method of all: Any physical security assessment should consider defenses against the full range of potential threats, not just vulnerability to lock picking. Picking locks requires skill, practice, and the use of rather unusual and not widely available tools. Few burglars can afford to risk exposure during the time required to pick even relatively easy locks, and unexplained possession of lock picking tools is often considered prima facia evidence of criminal intent. Criminals generally prefer either procuring a key or forced entry for speed, certainty, and stealth, notwithstanding whatever property damage or evidence is left behind. Lock picking is useful and worth studying for its generality and simplicity. The principles and skills of lock picking, once mastered, can be applied against the vast majority of commercial pin tumbler locks, and the basic tools, if somewhat unusual, are quite simple. Lock picking is a core skill of

the locksmithing trade and is also of value to those evaluating, investigating, and studying security systems. Picking depends on weaknesses in the implementation of locks -- small manufacturing imperfections -- rather than fundamental, abstract design flaws that would be present no matter how carefully made the locks might be. Contrast this, for example, to the weaknesses in the keyspaces of master keyed systems, which are independent of the physical qualities of the locks themselves. However, because the precision with which locks can be manufactured is limited by physical processes, materials, economics, and usability considerations, exploitable weaknesses almost always exist in practice. That said, better quality locks can be difficult and time consuming to pick. Picking Pin Tumbler Locks The modern pin tumbler lock is quite simple, dating back to ancient Egypt but not commercially mass-produced until the middle of the 19th century. The basic design consists of a rotatable cylinder tube, called the plug, linked to the underlying locking mechanism. Around the circumference of the plug is a shell, which is fixed to the door or container. Rotation of the plug within the shell operates the locking mechanism. In the locked state the plug is prevented from rotating by a set of movable pin stacks, typically under spring pressure, that protrude from holes in the top of the opening in the shell into corresponding holes drilled into the top of the plug. Each pin stack is cut in one or more places perpendicular to its length. In practice, the cuts are produced by stacking pin segments of particular lengths, not by actually cutting the pins; hence the term "pin stack. When a key is inserted into the keyway slot at the front of the plug, the pin stacks are raised within the plug and shell. Wards in the keyway restrict the keys that can be inserted. The plug will be blocked from rotating if any pin stack is lifted either not far enough with the cut still in the plug below the shear line or too far with the cut pushed above the shear line and into the shell ; to rotate, all pin stacks must have a cut at the shear line. The height or cut depth of a key under each pin stack position is called its bitting; the bitting of a key is the "secret" needed to open a lock. A key that is bitted to the wrong depth in even one pin position will not operate the lock. A pin tumbler lock cylinder. Side view, with part of the shell and plug cut away to expose the six pin stacks. Note the border between the plug and shell, which forms the shear line, and the cuts in each pin stack resting within the plug. Pin tumbler lock with a correct key inserted. The correct key lifts the pin stacks to align the cuts at the shear line. With all of the cuts at the shear line, the plug can rotate freely within the shell. Here the plug has been turned slightly toward the camera, so that the tops of the pins in the plug are visible. In an ideal lock, all of the pin holes in the plug would be in perfect alignment with the corresponding holes in the shell, the centerline of the plug would be exactly parallel to that of the shell, and all of the pins would be exactly the same diameter. If you tried to rotate the plug of such a lock without a key in the keyway, the top pin segment of each pin stack would block the plug at exactly the same number of degrees of rotation; each pin stack would contribute equally to preventing the plug from turning. These imperfections are very small -- as little as. Pin tumbler lock picking consists of raising the cuts on each pin stack to the shear line, one by one, until the plug turns freely. In particular note that because the pins are slightly out of alignment, as the plug is turned gently, only the pin stack that is most out of alignment actually prevents further rotation. The top pin of the most misaligned pin stack becomes "pinched" at the shear line between the plug and the shell. If this pin stack is slowly pushed up with torque applied to the plug, eventually its cut will reach the shear line and the plug will turn a bit more. The top pin of that pin stack will be trapped above the shear line, the bottom pin will fall freely, and now a new pin stack the next most misaligned one prevents further rotation. The basic algorithm for picking locks is remarkably simple: Apply a small amount of torque to the plug. Repeat until lock turns: The rest is just technique -- locating and recognizing the state of each pin stack, manipulating the pins, applying torque to the plug. In the lab there is a collection of "training locks," mounted on boards, for practice. These locks are specially pinned to facilitate a more step-by-step approach. The basic skills of pin tumbler lock picking include selecting the proper tools, manipulating pins through the keyway, applying torque, and recognizing the state of each pin. Lock Picking Tools Success in lock picking is mostly a matter of skill. Good tools are important, to be sure, but once a few basic tools are available the student of lock picking is usually better off investing in new locks on which to practice rather than in new picking tools. Picking tools are designed to perform one of two basic functions: Two tools -- one for each function -- are used simultaneously when picking a lock. Picks probe and lift the individual pin tumblers through the keyway, while torque tools control

the degree and force of plug rotation. Both the pick and the torque tool also amplify and transmit feedback about the state of the lock back to their user. Other names for the torque tool are turning tool, torque wrench, torsion wrench, and tension wrench. A wide variety of lock picking tools are commercially available from locksmithing supply vendors, often packaged in elaborate and expensive kits containing a baffling array of oddly shaped instruments of dubious utility. A few basic tools are sufficient to pick the majority of commonly used locks. Unfortunately, many of the commercially available lock pick kits consist mostly of useless gimmicks. Worse, they often omit the designs that are of the most practical value. The proper pick and torque tool selection depend on the shape of the keyway, the features of the lock, the picking technique, and the individual preferences of the user. Examples of some of the better quality commercially available picking tools can be found at www. Picks Over the years, the locksmithing industry has settled on a number of "standard" pick designs. Unfortunately, these designs are less than ideal, and many of the "standard" picks are too large to fit and move comfortably in common lock keyways. Many experienced locksmiths and expert lock pickers prefer "home made" tools to the commercial selections, especially for picking unusual and high security locks. The shape of the tip is the most obvious difference between picking tools, with hooks, half-diamond, ball, double ball, wave, sawtooth and other styles available. It is not clear what some of these picks are intended to actually do. For most of the picking methods discussed here, in which tumblers are manipulated one by one, a "hook"-style pick is generally used. A functional pick kit should contain several different size hooks to accommodate a range of different keyway shapes. Other differences between picks, aside from the shape of the tip, are the material, finish, width and thickness of the tang shaft, and the shape and material of the handle. Much of this is simply a matter of individual preference, but certain choices here can also have an impact on performance. The pick must be strong enough to resist bending or breaking while lifting pins, yet the shaft must be small and thin enough to maneuver freely around the keyway without disturbing other pins. Spring steel or stainless steel, between. Many manufacturers outfit their picks with elaborate and supposedly "ergonomic" handles, but these often hinder performance as much as they might enhance it. Torque tools The selection of the torque tool is just as important as that of the pick, but, again, commercial pick kits often fail to include a sufficient range of sizes and designs to allow good control and feel across the range of common locks. The traditional torque tool is made from stiff, flat spring steel, bent at a 90 degree angle to provide a small blade that fits in the keyway and a long handle to which torque is applied. If the torque tool is too thin, it will tend to be "springy" and will absorb much of the fine movement and control needed to successfully pick better quality locks.

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3: How to Pick a Lock with a Hairpin | Fab How

Picking Pin-and-tumbler Locks Prev NEXT The pins in a pin-and-tumbler lock when no key is inserted (top) and when the correct key is inserted (bottom): When the correct key is inserted, all of the pins are pushed up to the same level, flush with the shear line.

Prev NEXT The pins in a pin-and-tumbler lock when no key is inserted top and when the correct key is inserted bottom: When the correct key is inserted, all of the pins are pushed up to the same level, flush with the shear line. In the last section, we saw that the correct key will position the pins in a pin-and-tumbler lock so that all of the lower pins rest in the cylinder plug and all of the upper pins rest in the cylinder housing. To pick this sort of lock, you simply move each pin pair into the correct position, one by one. There are two main elements involved in the picking process: They are used to reach into the lock and push the pins up Tension wrench - Tension wrenches come in all shapes and sizes. The simplest sort of tension wrench is a thin flathead screwdriver. The first step in picking a lock is to insert the tension wrench into the keyhole and turn it in the same direction that you would turn the key. This turns the plug so that it is slightly offset from the housing around it. As you can see in the diagram below, this creates a slight ledge in the pin shafts. This content is not compatible on this device. While applying pressure on the plug, you insert a pick into the keyhole and begin lifting the pins. The object is to lift each pin pair up to the level at which the top pin moves completely into the housing, as if pushed by the correct key. When you do this while applying pressure with the tension wrench, you feel or hear a slight click when the pin falls into position. This is the sound of the upper pin falling into place on the ledge in the shaft. In this way, you move each pin pair into the correct position until all of the upper pins are pushed completely into the housing and all of the lower pins rest inside the plug. At this point, the plug rotates freely and you can open the lock. Conceptually, the lock-picking process is quite simple, but it is a very difficult skill to master. Locksmiths have to learn exactly the right pressure to apply and what sounds to listen for. They also must hone their sense of touch to the point where they can feel the slight forces of the moving pins and plug. Additionally, they must learn to visualize all the pieces inside the lock. Another technique is raking. Raking is much less precise than actually picking. To rake a lock, you insert a pick with a wider tip all the way to the back of the plug. Then you pull the rake out quickly so that it bounces all of the pins up on its way out. As the rake exits, you turn the plug with the tension wrench. Often, locksmiths will start by raking the pins, and then pick any remaining pins individually.

PICKING PIN TUMBLER LOCKS pdf

4: Lock picking - Wikipedia

Pin tumbler lock pick (ing) is relatively easy, even with homemade lock picks. Most pin tumbler locks have four or five pins. These types of locks include most padlocks which are not combination, deadbolts, doorknob locks, and cars, which usually have double sided pin tumbler locks.

David March 28, Urban Survival In an urban survival situation, all bets are off. You must do everything possible to keep you and your family alive- even if it means breaking into a building. Obviously, this is very illegal and there are serious consequences to doing this. But after a huge disaster, like an EMP attack or hurricane , you might be left without food, water, and shelter. To answer the question, no- lock picking is not difficult. People carry a false belief that you must spend thousands of hours to master lock picking. What is Lock Picking? So, what exactly is lock picking? Believe it or not, lock picking is more of an art than a science. You can only become good at it if you practice. There are a huge variety of locks in existence today. Fortunately for us, each one is based on the same basic design. In most states, owning lock picks is perfectly legal. There are, however, four states in which possession of picks can be considered evidence of criminal intent. These include Virginia, Ohio, Nevada, and Mississippi. Additionally, owning lock picks in Tennessee is considerably restricted under current law. This lock type is composed of five basic components: Where the key is inserted. Located above the key pins. Located below the driver pins. Hold down the driver pins and key pins. As a key enters the cylinder, it pushes the key pins flush with the shear line. At the same time, the driver pins are pushed upwards, allowing the lock to open. These are the basics of how a pin tumbler lock works. A quality set of lock picks will allow you to master the fundamentals, while having fun in the process. Not only does it come a set of 12 lock pick tools, it also comes with a lock to practice on and two keys. The Tension Wrench Arguably the most important tool in your set will be the tension wrench. This bent piece of metal serves two purposes: If you can do this, the other methods will be easy in comparison. Start by inserting your tension wrench and giving it enough pressure to bind the first binding pin. Remember, keep constant tension throughout the entire process. The majority of the pins will be easy to life with the exception of the binding pin. As you continue to apply pressure on your tension wrench, gently life the binding pin. Once the pin reaches the shear line, you should feel a slight amount of give in turning the plug. Once you set the first pin, this means that the binding pin will no longer be getting in your way. The plug will then turn until it reaches the next pin furthest from the centerline. This will become your new target. Throughout this time, you should be applying constant pressure to your tension wrench, as well as repeating the above steps until the lock opens. Lock picking is a super-useful urban survival skill to have. Visual Guide to Lock Picking.

PICKING PIN TUMBLER LOCKS pdf

5: How To Pick Locks: The Definitive Guide To Lock Picking

Amazon's Choice for "tumbler lock pick" Practice Lock Set, 6 Transparent Locks for Lock Picking Practice, Visual Guide Included it has a 5-pin tumbler key and.

The shafts of a pin-and-tumbler lock contain several springs and tiny pins. One cool thing about pin-and-tumbler locks is that you can re-configure them to fit an existing key provided that the key is for the same lock design. The advantages of this are obvious: You can add new locks to your home or business without attaching a bunch of new keys to your key ring. To make a new key for an existing lock, you cut a series of notches in the key so that it raises each of the upper pins just above the shear line. Essentially, you cut a pattern in the metal that matches the pattern of the pins in the lock. To change a lock so that it fits an existing key, you simply work in the opposite direction: You change the pattern of the pins in the lock so that it matches the pattern of notches in the key. If the lock is designed with a universal keying system, any locksmith can re-key the lock in no time. You can also get locks re-keyed at most hardware stores. The right combination of pins lines up perfectly with the notches in the key. In this basic six-pin lock set, you can see how this re-keying works. When you open up the shafts in the cylinder and empty them out, you have six springs and 12 tiny pins. All of the upper pins are exactly the same size. The remaining six pins the lower pins will be of various lengths to match up with the notches on the key. The process of re-keying a lock is very simple. The locksmith removes all of the pins from the cylinder. Then, drawing from a collection of replacement pins of various sizes, the locksmith selects new lower pins that fit perfectly between the notches of the key and the shear line. This way, when you insert the new key, the lower pins will push all the upper pins just above the shear line, allowing the cylinder to turn freely. This process may vary depending on the particular design of the lock. The entire process takes only a few minutes. Some locks are designed to work with two different keys. The change key will open only that specific lock, while the master key will open that lock and several others in a group. In these locks, a few of the pin pairs are separated by a third pin called a master wafer or spacer. When three pins are combined in a shaft, there are two ways to position the pins so they open the lock. The change key might raise the pins so that the shear line is just above the top of the master wafer, while the master key would raise the pins so the shear line is at the bottom of the master wafer. In both cases, there is a gap at the shear line and the key is able to turn. In this lock design, the lowest pin would be the same length in each lock in the group, but the master wafer would vary in length. This lets one person, say a building manager, access many different locks, while each individual key-holder can open only his or her own lock.

PICKING PIN TUMBLER LOCKS pdf

6: Picking Pin-and-tumbler Locks | HowStuffWorks

A tubular lock pick is a specialized lockpicking tool used for opening a tubular pin tumbler lock. Tubular lock picks are all very similar in design and come in sizes to fit all major tubular locks, including 6, 7, 8, and pin locks.

History[edit] The first tumbler lock was found in the ruins of the Palace of Khorsabad in Iraq. The bolt had vertical openings into which a set of pins fitted. These could be lifted, using a key, to a sufficient height to allow the bolt to move and unlock the door. In , the earliest patent for a double-acting pin tumbler lock â€" one where lifting the pins too much or too little prevented opening â€" was granted to American physician Abraham O. Two years later, Stansbury was granted a patent in the United States for his lock. In this type of lock, an outer casing has a cylindrical hole in which the plug is housed. To open the lock, the plug must rotate. The plug has a straight-shaped slot known as the keyway at one end to allow the key to enter the plug; the other end may have a cam or lever, which activates a mechanism to retract a locking bolt. The keyway often has protruding ledges that serve to prevent the key pins from falling into the plug, and to make the lock more resistant to picking. A series of holes, typically five or six of them, are drilled vertically into the plug. These holes contain key pins of various lengths, which are rounded to permit the key to slide over them easily. Above each key pin is a corresponding set of driver pins, which are spring-loaded. Simpler locks typically have only one driver pin for each key pin, but locks requiring multi-keyed entry, such as a group of locks having a master key, may have extra driver pins known as spacer pins. The outer casing has several vertical shafts, which hold the spring-loaded pins. When the plug and outer casing are assembled, the pins are pushed down into the plug by the springs. The point where the plug and cylinder meet is called the shear point. With a key properly cut and inserted into the groove on the end of the plug, the pins will rise causing them to align exactly at the shear point. This allows the plug to rotate, thus opening the lock. When the key is not in the lock, the pins straddle the shear point, preventing the plug from rotating. Modern Mechanism Without a key in the lock, the driver pins blue are pushed downwards, preventing the plug yellow from rotating. When an incorrect key is inserted into the lock, the key pins red and driver pins blue do not align with the shear line; therefore, it does not allow the plug yellow to rotate. When the correct key is inserted, the gaps between the key pins red and driver pins blue align with the edge of the plug yellow. With the gaps between the pins aligned with the shear line, the plug yellow can rotate freely. Cylinder locks[edit] Euro profile locks, an example of a cylinder lock. These are commonly found on uPVC doors and commercial buildings where re-keying doors is common. Commonly pin tumbler locks are found in a cylinder that can be easily unscrewed by a locksmith to facilitate rekeying. The first main advantage to a cylinder lock, also known as a profile cylinder lock or euro, is that the cylinder can be changed without altering the boltwork hardware. Removing the cylinder typically requires only loosening a set screw, then sliding the cylinder from the boltwork. The second is that it is usually possible to obtain, from various lock manufacturers, cylinders in different formats that can all be used with the same type of key. This allows the user to have keyed-alike, and master-keyed systems that incorporate a wide variety of different types of lock, such as nightlatches, deadbolts and roller door locks. Typically, commercial padlocks can also be included, although these rarely have removable cylinders. Standardised types of cylinder include: Rim mounted also known as night latch cylinders Euro cylinders.

7: Compromising Locks - www.enganchecubano.com

Tubular locks are very similar to pin and tumbler locks and are actually a tubular pin-tumbler lock. Also known as Ace locks, axial pin-tumbler locks and radial locks. All the features of a standard pin-tumbler lock are still there, just configured in a circular pattern rather than inline as standard pin-tumbler lock is.

I have tried to include as much information about the different types of locks that I am familiar with and the techniques that may be used to compromise them. This list is not exhaustive by any means. It simply covers the types of locks that I have been exposed to and have had the time to research. There is a section concerning the implications of relying on locks for your personal security purposes at the end of this document. I do not hold a degree in this subject: If there is information in this document that you believe to be erroneous, please feel free to contact me and I will be happy to change or remove the material in question. I do not in any way condone the criminal negligence that may occur from the misuse of this information. I am not teaching the reader how to become a criminal. This information is presented strictly for educational purposes. Knowing how to pick a lock is no more criminal than knowing how to use bolt cutters or how to project a brick through a window. To disassemble a lock you must first cut the thru-bolts. When this is achieved and the bottom plate is removed the lock will look something like what we see in figure 1. From this view we can clearly begin to see the internal mechanisms of the lock. The most important component of a lock is the center item in figure 2. What exactly comprises this mechanism you ask? Move on to figure 3. Looking more closely at figure The main cylinder 1 terminates into an interface at the top of the lock and when rotated depresses a lever that opens the lock. The holes that are bored through the top of it accepts the key pins 4. These pins are random in size and dictate the "key" of the lock. This cylinder resides within the cylinder body 5 which holds the set pins 3 which are spring loaded into their appropriate columns. These items are assembled together and locked into place with the spring clip 6. When a key is inserted into a lock figure 4: When the set pins clear the shear line they enable the main cylinder to rotate freely thus opening the lock. These come in various sizes and pin variations and may also be comprised of different materials depending on manufacturer. I included Figure 5 so that you could see how the pins are arranged while at rest. Notice how the key pins stop at what is the middle of the radius of the cylinder just above a key ward. This is what keeps these pins in place. There are some noticeable differences between padlock cylinders and dead bolt cylinders. The first thing that you will likely notice is the number of pins. These pins are also slightly larger in size than those of a padlock. The more expensive the dead bolt or padlock, the more intricate the pin design and implementation. Although there are many different implementations of parts and assembly, all locks of these types follow this basic design. I will spend a little more time on the subtle differences between manufacturer designs a little later on as these differences pertain to picking them. I would like to cover one more lock design before I jump into some theory. See figure 7 for an example. Wafer tumbler locks typically implement some type of lever catch system. A quick glance at that key tells us that there is at least 6 pins in this devil. They are technologically inferior to their pin tumbler counterparts. These locks rely on a series of spring loaded brass wafers for their security, see figure 9. To determine whether it is a pin tumbler or wafer tumbler mechanism that you are up against the following tests should quickly confirm the type: If they are visible it is usually a dead giveaway. The key cylinder is usually ill fitted. You will notice significant side to side play as force is applied to the cylinder. Due to the construction of wafer locks there is a lot of dead space surrounding the parts. If you depress the wafers and quickly release them you will notice that they make a "snapping" sound as opposed to a "click" as expected of pin tumbler models. Looking at the cylinder body item on the right in figure 8 we can see that their is more than one position that the main cylinder can lock into place. The reason for this is that the key cylinder is not controlling a complex opening mechanism interacting with other levers, springs, etc. This of course depends on orientation. So what are the other two flutes for? As the key passes through the wafers it moves them up and down figure The wafers that are up reside in the upper flute of the cylinder body and the ones that are pushed down reside in the bottom flute. Until the proper key has been fully inserted their will always be 6 points of contact on the main body. This ensures that the lock will provide maximum security

if anything not resembling the original key were to be inserted and turned. Wafer tumbler locks while anatomically different from pin tumbler mechanisms still react to the same pin manipulation techniques. Look closely at the following image for a moment: I have placed two set pins, one at each end to stabilize the key cylinder. The key is under pressure, gravity to be more precise. Now, carefully examine those columns. Do you notice anything odd as you peer down them? If you look closely you can see that the top of the key cylinder is visible brass ledge. Locks are not exactly a precision instrument. In order for a lock to operate smoothly there must be some play in the system. This play is achieved by the allowance for these columns to be slightly larger than the pins themselves. Going back to figure 12 for a sec. If I got out my micrometer and measured each overlap I would notice that the distances away from the cylinder body would not be consistent. What I mean by this is: If I drew a straight line across these columns, the point at which the cylinder holes make contact with the line would not be exactly parallel. This is due to the inherent play between the cylinder and the cylinder body. In order for the cylinder to spin there must be an allowance for movement. When a key or something simulating a key is inserted and turned there will be side pressure on the cylinder causing it to skew and create this situation. This "play" I mentioned varies from lock to lock. The more expensive the lock, the more likely it was designed with superior materials and more advanced machining processes. With this, tolerance levels will be decreased and the lock will be more difficult to pick. There are also other methods that manufacturers employ that can make picking a lock not only more difficult but also frustrating. Above figure 13 is a picture of a key pin and a set pin. These are actually butted up tight to each other. Notice how where they make contact they are rounded and not flat. Considering what we have examined so far, we can deduce that as long as there is pressure on the key, the cylinder holes will overlap the cylinder body creating a ledge. Even if the pins were flat, they would most likely get stuck on this ledge and the fact that they are tapered more surface area for contact just reinforces there tendency to get stuck. Now, considering the inconsistency of this ledge, every time a pin is lodged past the shear line see figure 4. If the pressure on the cylinder is maintained and another pin is depressed it too will get caught on this ledge, and so on. Later I will explain some methods of devising your own instruments for picking locks. A basic set includes the following items. This is a great all around pick. It is most useful for pin-at-a-time picking. It can also be used for scrubbing. The main advantage of this pick for scrubbing is that you can usually reach over the second last pin if it is set high while the last pin is set low. It also provides you with a little more control on individual pins. As you become a little better at lock picking this is the pick of choice for scrubbing. They are available in many different sizes but you will probably find the smaller more tapered edge type is the most versatile. The brass handle that you see is typical. The pick is held in place with a couple of hex head set screws. These can be loosened so that the handle may except other picks. Again, designed specifically for scrubbing. The main advantage of this pick is the likelihood of the pick setting more than one pin at once. On an easy lock you can sometimes open it with one sweep. The torque wrench is simply used to apply pressure on the cylinder. They come in various sizes and it is a good idea to have some smaller ones in width on hand.

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I show how pin-tumbler locks work and how they can be opened using lockpicks. This is a fairly basic view about lock picking but I wanted to make it comprehensive to give people a good idea of the.

Wikipedia article on pin tumbler locks Pin tumbler locks are particularly suited to master keying, where each lock in the group can be opened by either a master key, which will open any lock in the group, or a specific change key, which will open only that one lock or others identical to it. This is done by using pins with more than two parts, so that it will shear at more than one position. However, in poorly supervised areas, those who have access to a door that is unlocked or for which they have a legitimate key can remove the lock from the door and disassemble it to determine the master keying pattern. In , a method was published that allowed a person with a change key to find out the master key using a few blank keys one for each pin in the lock and finding out the alternate cut of the pin for each pin individually, without dismantling the lock at all, thus effectively eliminating the "poorly supervised area" requirement for the attack. Some pin tumbler locks have special security pins, with serrations, mushroom heads, or spool shapes, that make lock picking more difficult by causing the pins to bind in locations other than their correct ones. Traditional Picking[edit] A tension wrench or torque wrench is used to apply a torque to the cylinder, while a lock pick or picklock is used to push individual pins up until they are flush with the shear line. As each pin is manipulated to its correct height, the cylinder will turn fractionally causing another pin to bind. The pins will not bind simultaneously because they will not be aligned perfectly with the axis of the cylinder. Once all of the pins are flush with the shear line, the tension wrench can be turned fully to open the lock. A traditional set of lockpicks. The two tools on the left are tension wrenches Most of the simple pin tumbler automatic padlocks can be picked without a torque wrench using the so-called safety-pin-method. These padlocks allow the picker to open the lock while applying pressure to the side and raking at the same time - with the same tool a bent wire in this case. Cheap and small padlocks may even open more easily with a safety pin than with a key. A refinement of this kinetic technique is the use of bump keys. These are keys with all the cuts at or slightly below the deepest level for a key made by the manufacturer, and a small amount of material removed at the tip, and, where applicable, at the shoulder - the part of the key that prevents the key from entering the lock too deeply. By sharply striking the bump key, it is possible to apply an even impact to each pin column, which then separates as if struck using a pick gun. Bump keys will work in many locks that pick gun needles will not fit into. To defend against these attacks, high-security locks use a sidebar, which engages from another axis and also prevents the lock from turning. Medeco locks do this by requiring the pins to be rotated to a correct position, as well as moved to their correct height. Other brands put the sidebar cuts in the side of the key. Raking or Scrubbing Raking or scrubbing a pin tumbler lock is usually done before individual pins are pushed up. While applying torque with the tension wrench, a lock pick with a wide tip is placed at the back of the lock and quickly slid outwards with upward pressure so all the pins are pushed up. Raking may allow some of the pins to remain flush with the shear line, and can make the job easier.

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9: Notes on Picking Pin Tumbler Locks

We now have a usable set of lock picking tools, but before we can attempt to pick any locks it is important to first understand how exactly a pin and tumbler locking mechanism works.

Skeleton keys[edit] The warded pick, also known as a skeleton key , is used for opening warded locks. It is generally made to conform to a generalized key shape relatively simpler than the actual key used to open the lock; this simpler shape allows for internal manipulations. The keys for warded locks only require the back end manipulating which is the end which actually opens the lock. The other parts are there to distinguish between different variation of their locks. From left to right: Lever tumbler lock picking[edit] Lever tumbler locks can be opened by a type of lockpick called curtain pick. It is used to apply torque to the plug of a lock in order to hold any picked pins in place. Once all pins are picked, the torsion wrench is then used to turn the plug and open the lock. There are two basic types - "bottom of the keyway" and "top of the keyway". Bottom of the keyway wrenches are typically shaped like a letter "L", although the vertical part of the letter is elongated in comparison to the horizontal part. Other torsion tools, especially those for use with cars, resemble a pair of tweezers and allow the user to apply torque to both the top and the bottom of the lock. These are commonly used with double-sided wafer locks. Half-diamond pick[edit] This versatile pick is included in nearly all kits and is mainly used for picking individual pins, but can also be used for raking and for wafer and disk locks. The triangular-shaped half-diamond is usually 2. The angles that form the base of the half-diamond can be either steep or shallow, depending on the need for picking without affecting neighboring pins, or raking as appropriate. A normal set comprises around three half-diamond picks and a full-diamond pick. Hook pick[edit] The hook pick is similar to the half-diamond pick, but has a hook-shaped tip rather than a half-diamond shape. The hook pick is sometimes referred to as a "feeler" or "finger" and is not used for raking. This is the most basic lockpicking tool and is all that a professional will usually need if the lock is to be picked in the traditional sense rather than opened by raking or using a pick gun. A variety of differently sized and shaped hooks are available in a normal set. Ball pick[edit] The ball pick is similar to the half-diamond pick, except the end of the pick has a half or full circle shape. This pick is commonly used to open wafer locks. Rake picks[edit] Two types of rake pick, the double and triple peak, sometimes known as bogota rakes These picks, such as the common snake rake, are designed to rake pins by rapidly sliding the pick past all the pins, repeatedly, in order to bounce the pins until they reach the shear line. This method requires much less skill than picking pins individually, and generally works well on cheaper locks. Advanced rakes are available which are shaped to mimic various different pin height key positions and are considerably easier to use than traditional rakes. Such rakes are typically machined from a template of common key configurations, since not all permutations of pin heights for adjacent pins are possible given the process by which keys are manufactured. Decoder pick[edit] The decoder pick is a key which has been adapted such that the height of its notches can be changed, either by screwing them into the blade base or by adjusting them from the handle while the key is in the lock. This will allow not only access to the lock but also a template for cutting a replacement key. Bump keys[edit] A typical bump key The simplest way to open the majority of pin locks is to insert a key or variety of keys which have been cut so that each peak of the key is equal and has been cut down to the lowest groove of the key. This key is then struck sharply with a hammer whilst applying torque. If done correctly this briefly creates a gap around the shear line allowing the plug to rotate freely. Wafer tumbler lock picking[edit] Jigglers or try-out keys[edit] Majority of wafer tumbler locks can be opened with a set of jigglers or try-out keys. Snap gun A snap gun The manual pick gun or snap gun was invented by Ely Epstein. Electric versions are now also common, where by simply pressing a button the pins are vibrated while the normal torsion wrench is being used. Tubular lock pick[edit] A tubular lock pick is a specialized lockpicking tool used for opening a tubular pin tumbler lock. Tubular lock picks are all very similar in design and come in sizes to fit all major tubular locks, including 6, 7, 8, and pin locks. The tool is simply inserted into the lock and turned clockwise with medium torque. As the tool is pushed into the lock, each of the pins is slowly forced down until they stop, thus binding the driver pins behind the shear line of the lock. When the final pick is pushed down, the shear plane

is clear and the lock opens. This can usually be accomplished in a matter of seconds. Most tubular lock picks come with a "decoder" which lets the locksmith know at what depths the pins broke the shear plane. By using the decoding key after the lock has been picked, the locksmith can cut a tubular key to the correct pin depths and thus avoid having to replace the lock. Anti-picking methods[edit] A deadbolt lock that has been picked, showing that the plug has been turned without the key. The history of lock development, particularly modern locks is largely one of an arms race between lock pickers and lock inventors. These are shaped like a spool, mushroom, or barrel - with the effect that they feel as though they have set when in fact they have not. Lock pick tools fit in the same category as crowbars or hammers, meaning they are legal to possess and use unless they are used to commit a crime or if it is shown there was intention to commit a crime. Section of the Canadian Criminal Code criminalizes the "possession any instrument suitable for the purpose of breaking into any place, motor vehicle, vault or safe under circumstances that give rise to a reasonable inference that the instrument has been used or is or was intended to be used for such a purpose", and carries a maximum penalty of 10 years in prison. Similar to some drug trafficking offences, this may be automatically applied if possession is discovered, though corroborating evidence is needed to support these charges. For example, the discovery of lock picks in a dwelling house in absence of other indications of burglary are not grounds for this charge. It is not uncommon for hackathon events in Canada to have lock picking challenges, and this would constitute a reasonable and legal reason for possession. Germany[edit] There is no law or regulation on lock picking, so it is legal as long as one has permission from the owner of the lock to pick the lock in question. Lock picking tools can be freely bought and sold. There are several clubs where lock picking is practised as a sport. There is a lock picking championship, the Dutch Open organized by TOOOL , which started in and features competitors from around the world. The competition is held during LockCon, an annual conference about locks. United Kingdom[edit] In England and Wales , a person who carries anything at all with the intent to commit burglary or theft can potentially be prosecuted. In the case of items specifically made or altered to be usable in burglary or theft, such as lock-picks, mere possession presumes intent â€” there is no need to prove it. Generally, possession and use of lock picks is considered equivalent to the possession of a crowbar or any other tool that may or may not be used in a burglary. Possession of lock picks with an intent for their unlawful use is generally prosecuted as a misdemeanor under the category of possession of burglary tools or similar statutes. In many states, simple possession of lock picks is completely legal, as the statutes only prohibit the possession of lock picks or the activity of lock picking when there is a malicious intent.

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