

Professional Locksmith

Study Unit 3

Identifying Keys

Preview

This study unit covers the all-important subject of key identification. Key duplication is one of the most needed and requested locksmithing skills. There are literally thousands of different keys out there, so when a customer comes into your shop to have a key duplicated, it's essential that you be able to do so quickly, efficiently, and profitably. It's sometimes said that the ability to identify an unknown key is the hallmark of the true professional locksmith. This ability will come to you with learning and experience, and by the end of this study unit, you'll be well on your way to mastering the skill!

When you complete this study unit, you'll be able to

- Explain the importance of key identification to the locksmithing trade
- Explain the difference between bit, barrel, tubular, flat, cylinder, and dimple keys
- Name the types of locks that these keys are used with
- Name the parts of a key or key blank
- Interpret the identifying markings on a key and use that information in key identification
- Identify the manufacturer of a key by looking at the shape of the key's bow
- Use a key blank catalog to identify unknown key blanks
- Use a cross-reference directory to match up key blanks made by different manufacturers
- Describe how key blanks are cut to make duplicate keys, both by hand and by machine
- Describe an efficient method of inventorying key blanks in a locksmith shop
- Identify a number of different old-fashioned or obsolete keys

Contents

INTRODUCTION	1
The Importance of Key Identification	
The Parts of a Key	
The Major Key Types	
How Keys Are Cut	
KEY IDENTIFICATION SYSTEMS	12
How Manufacturers Identify Their Keys	
Generic Key Blanks	
Neuter Key Blanks	
FINDING A MATCHING BLANK FOR A CUSTOMER'S KEY	19
Where Do You Start?	
Identifying the Manufacturer	
Working With an Unknown Key	
Your Key Blank Inventory	
What Blanks Should You Buy?	
IDENTIFYING UNUSUAL KEYS	33
The Mark of a True Professional	
Strange, Rare, and Obsolete Keys	
THE KEY TO SUCCESS	44
KEY POINTS TO REMEMBER	44
LOCKING IT UP! ANSWERS	51
APPENDIX	53
EXAMINATION	63
PRACTICAL EXAMINATION	67
COMING ATTRACTIONS	77

Identifying Keys

Do You Know. . .

What are the main parts of a cylinder key blank?

What is the E-Z numbering system?

What is a *cross-reference key directory*?

In these pages, you'll find the answers to these and many more questions dealing with the subject of key identification.

INTRODUCTION

The Importance of Key Identification

As a professional locksmith, you'll frequently be asked to duplicate a customer's key or keys. As a matter of fact, it's probably the most common reason why an individual seeks out the services of a locksmith. A duplicate key is made from a *key blank*, which is simply an uncut key. In order for the duplicate key to work in the customer's lock, the blade of the key blank you use must be *exactly the same* as the customer's original in shape and size. Obviously, then, being able to identify the customer's key and match it to the proper key blank is an extremely important locksmithing skill.

This study unit will teach you all you need to know to be able to quickly and easily identify any key and locate its match in your inventory. This is one of the most basic and vital skills of a professional locksmith.

Human beings have many different physical traits that make us different from one another. Dark hair, light hair, blue eyes, brown eyes, tallness, shortness, and so on—all of these are traits that make us look distinctly different from our neighbors. However,

people in the same family may have similar traits and resemble each other. And, identical twin brothers or sisters look exactly alike.

In the same way, keys have different characteristics that make them look different from each other. Keys made by the same

manufacturer will look similar, if not always identical (these keys are in the same “family”). However, every key made does have an “identical twin” somewhere (Figure 1). When you set out to make a duplicate key for a customer, your first task will be to locate the identical twin of the original key.

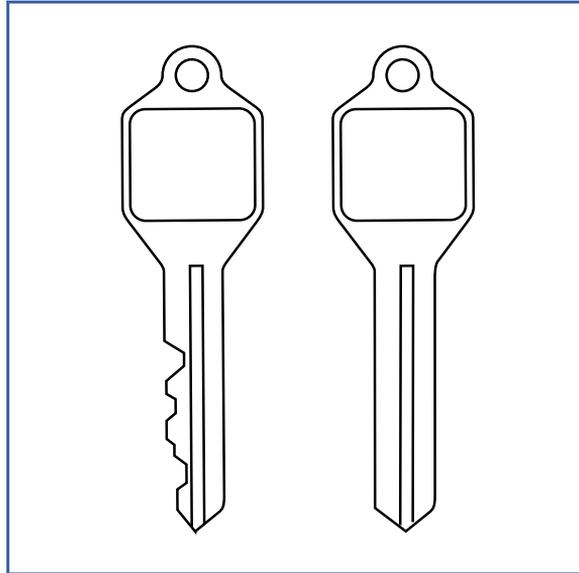


FIGURE 1—Every key made has an “identical twin” somewhere.

Every key manufacturer stamps identifying numbers on its key blanks (Figure 2). You can use these numbers to help you locate a matching blank for your customer’s key. And, whenever you call a manufacturer to order key blanks, you’ll use these numbers to place your exact order. A working locksmith keeps a fairly large inventory of different key blanks on hand. That way, any time a customer comes in, a key can be made immediately.

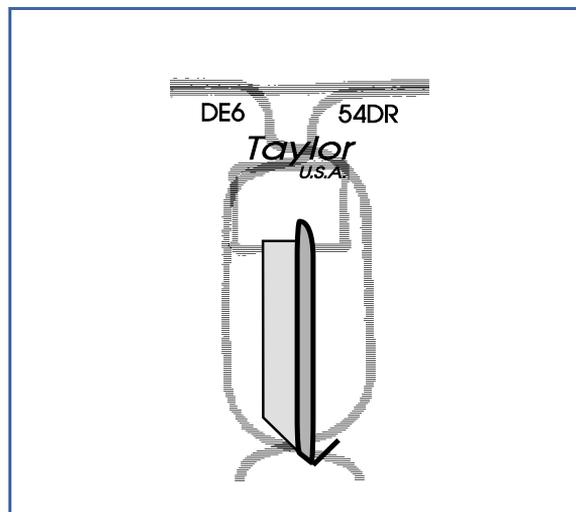


FIGURE 2—This key blank is manufactured by the Taylor Company.

The ease with which you can read the identifying information on a key depends to a large extent on the key’s condition. If the key is old and worn smooth, you won’t be able to easily read the numbers stamped on it. When this happens,

you'll need to identify using a visual comparison method (we'll discuss this method later in the study unit).

Now, before we get into the in-depth material on key identification, let's start out by taking a closer look at the basic parts of a key.

The Parts of a Key

A *key blank* is an uncut key—that is, a key without the distinguishing notches that will turn it into a working key. Take a minute now to look at the keys on your own key ring. Observe your house key or car key. Note the series of irregular cuts like a miniature mountain chain on the side of the key. A key blank lacks these cuts; consequently, it can't lock or unlock anything.

You might compare a key blank to an uncut piece of fabric before it has been tailored into a coat of precise size and proportions. You, the locksmith, will turn a key blank into a working key by “tailoring” it to exactly fit your customer's lock.

FIGURE 3—Parts of a Cylinder Key Blank

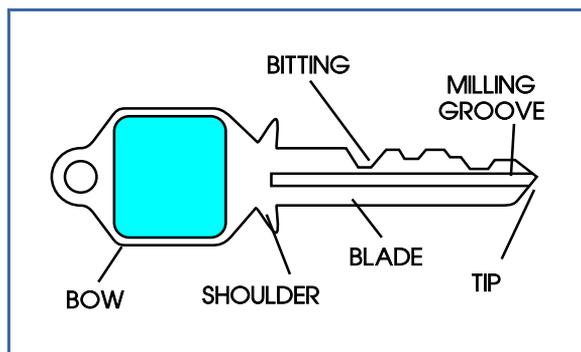
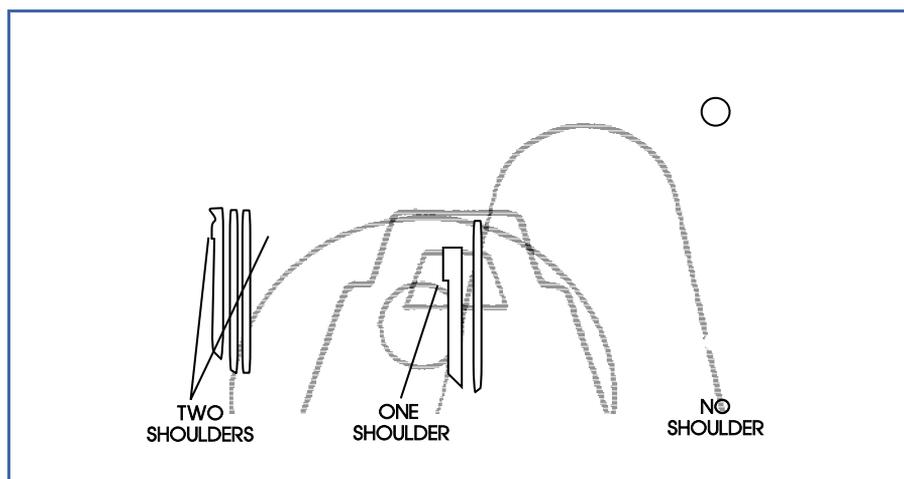


Figure 3 shows a typical cylinder key blank with its principal parts labeled (*bow, shoulder, blade, tip, bitting, and milling*). We'll take a closer look at each part in turn now.

Bow. The *bow* or handle of a key is the part that you grip with your fingers. The bow is the place to look for the important manufacturer's data that will aid you in key identification. The shape of the bow will vary depending on the manufacturer. We'll discuss bow shapes a little later in this study unit.

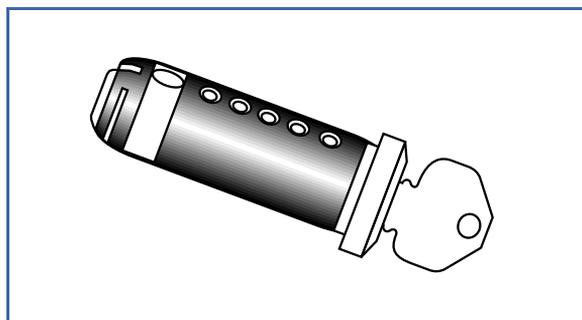
Shoulder. The *shoulder* of a key or key blank is the projection found between the bow and the blade. Most keys have two shoulders, but some keys have only one, and some have none (Figure 4).

FIGURE 4—This figure shows three key blanks—the first has two shoulders, the second has one, and the third has no shoulders.



The purpose of the key shoulder is to stop the key from penetrating too far into the lock mechanism (Figure 5). If you were

FIGURE 5—A key's shoulder prevents the key from penetrating a lock too deeply.



to force a key beyond its natural depth, it wouldn't work; it could also damage the lock. Thanks to the shoulder, you slip the key into perfect position every time.

Blade. The *blade* is the longest portion of a key where the locksmith cuts the distinctive pattern of notches that will turn a blank into a working key. You may sometimes find manufacturer's data on a key blade instead of the bow.

Tip. The *tip* of a key or key blank is simply the end of the blade.

Bitting. The cuts or notches made in the blade of a key are referred to as the *bitting*. The bitting must be cut precisely in order to allow the key to work in a lock.

Milling. On a key blank, the *milling* refers to the grooves engraved into the blade. Note that, typically, both sides of the blade are grooved (Figure 6).

Figure 7 shows several *end views* of keys. You can see a key's end view by holding it up and looking directly at the tip. The

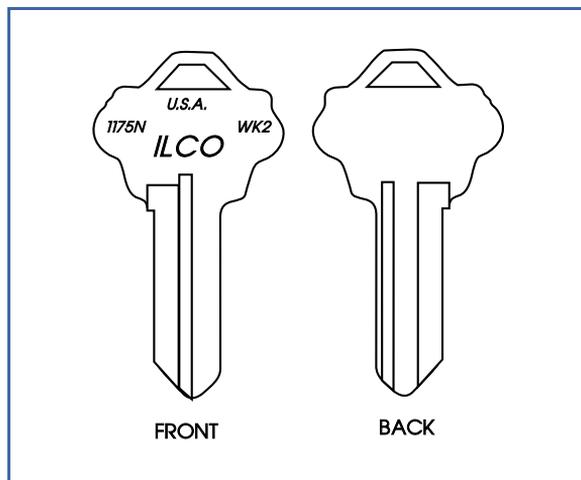


FIGURE 6—This illustration shows both sides of a key blank. Note that both milling grooves appear on both sides of the key.

end view clearly shows the shape of a key's milling grooves. The most common type of milling groove is the square cut. This cut is easy to manufacture and may be present in one or more areas of the blade on cylinder keys. Right- and left-angle grooves are also seen quite often on many key blanks. The final two kinds of milling grooves are the V-shaped groove and the half-round groove.

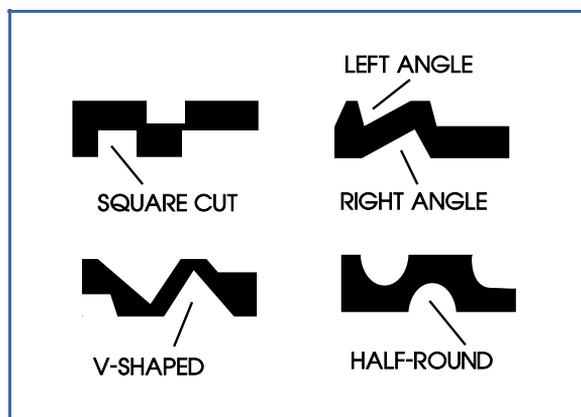


FIGURE 7—This figure shows four end views of the common milling groove shapes used in cylinder keys.

The Major Key Types

Now that you know the standard parts

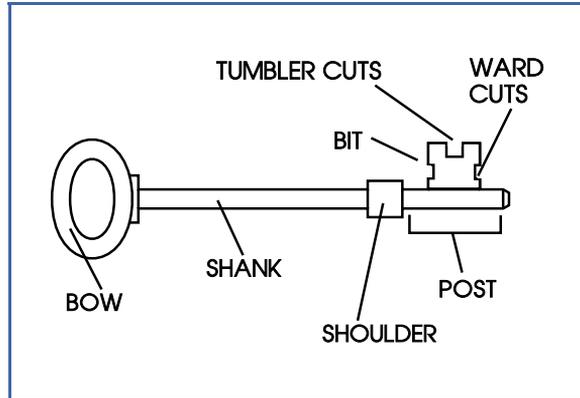
of a typical key, let's take a look at the various types of keys. The basic types of keys are the bit key, barrel key, tubular key, flat key, cylinder key, and dimple key. Each type of key is used with a particular locking mechanism.

Bit Keys

As you learned in Study Unit 2, bit keys are used to open *warded* locks. While these locks were once popular as front door locks, they're seldom seen today. However, in older homes, bit keys are still often used to open interior doors (closets, attics, etc.). Bit keys are also used with antique cabinets, cupboards, boxes, and desks. Owners of old homes or furniture may therefore occasionally need a locksmith to replace a lost bit

key. For this reason, you should be familiar with this type of key and how to duplicate one.

FIGURE 8—Parts of a Bit Key



A typical bit key is shown in Figure 8. Bit keys are made from a number of metals, but iron, brass, steel, and bronze are most common. The distinguishing feature of the bit key is the solid *bit* that operates the lock. The bit

is attached to the post on the end of the key. The *bit* is the blade of a bit key, and it's solid metal. Note that the shoulder of a bit key is positioned toward the end of the key.

Two types of cuts are used when making a duplicate bit key—*ward cuts* and *tumbler cuts*. The configuration of these cuts depends on the lock's mechanism. The tumbler cuts are made on the top edge of the bit, and the ward cuts are made on the sides of the bit.

A *skeleton key* is a common term you may hear applied to bit keys. A skeleton key is a bit key that has been specially filed down to bypass the wards in a warded lock. For this reason, one skeleton key can open several warded locks.

A *barrel key* is a variation of the bit key. However, while the bit key has a solid tip, the barrel key's tip is hollow. When a barrel

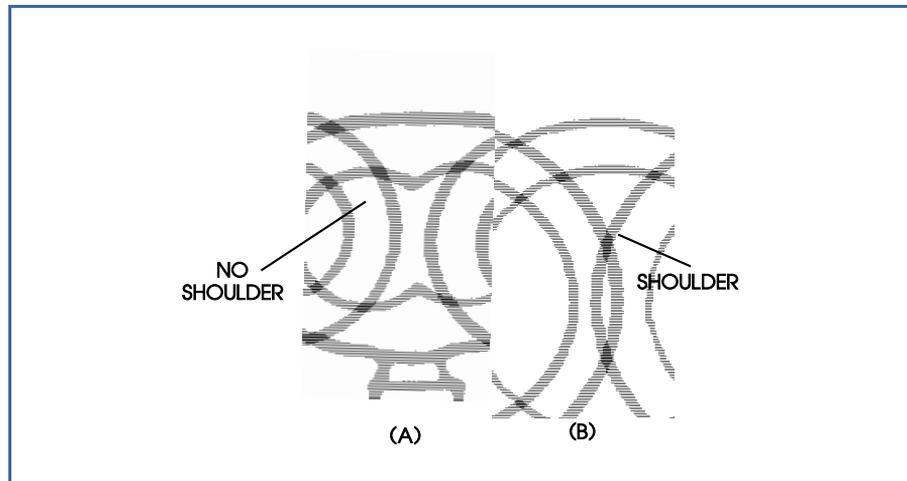
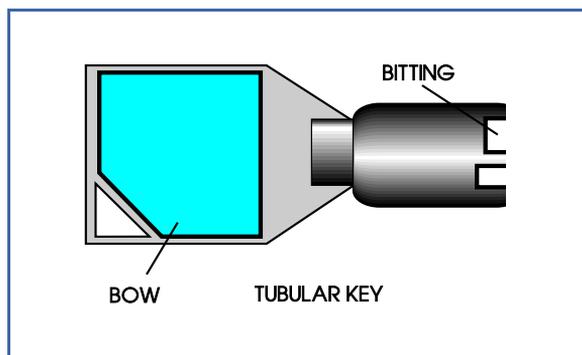


FIGURE 9—Figure 9A shows a barrel key without a shoulder; Figure 9B shows one with a shoulder.

key is inserted in a lock, the hollow tip fits over a pin in the lock keyway. So engaged, the key is held in the proper position for the bit to function inside the lock. A barrel key may or may not have a shoulder (Figure 9). Barrel keys are made from the same metals as bit keys.

FIGURE 10—Parts of a Tubular Key



A modern variation of the barrel key is the *tubular key* (Figure 10). Tubular keys are short, rounded, and hollowed out like barrel keys, but they function differently. Cuts are made on the round end of a

tubular key, as shown in Figure 10. Tubular keys are commonly used in the locks on vending machines, coin-operated laundry machines, and computers.

Flat Keys

Flat keys are made from thin, completely flat pieces of steel or nickel (Figure 11). Note the absence of milling grooves on the blade.

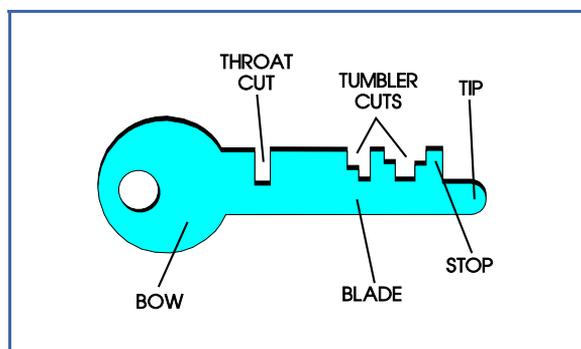


FIGURE 11—Parts of a Flat Key

Flat keys are used with lever lock mechanisms and warded padlocks. Jewelry boxes, luggage, strongboxes, typewriters, store showcases, and safe-deposit boxes are typically opened by flat keys.

Look at Figure 12 to observe the cuts on a flat key. Note that all the cuts in a flat key must be *exactly square*. Now, note the position of the *throat cut*. The throat cut functions as a shoulder in a

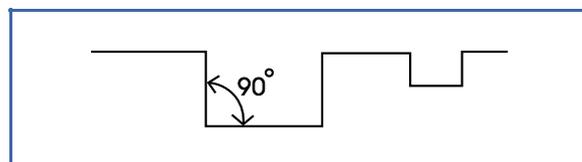


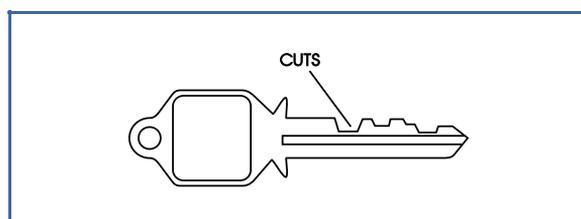
FIGURE 12—The cuts in a flat key must be exactly square.

flat key, keeping it from penetrating too deeply into the lock.

Cylinder Keys

The *cylinder key* is the most common type of key in use today. (The parts of a cylinder key were shown earlier in Figure 3.) You probably use a cylinder key to unlock and start your car or to open your front door. As a locksmith, you'll be dealing with this type of key most of the time. Cylinder keys are used to operate lock cylinders, which may contain pin tumbler or disk tumbler mechanisms.

FIGURE 13—The cuts in a cylinder key are usually squared at the bottom.



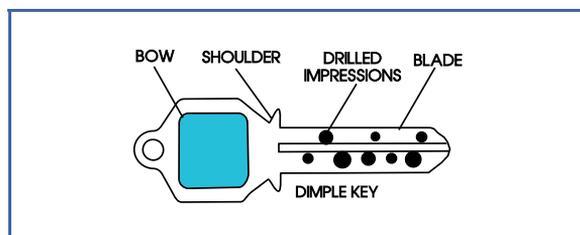
Cylinder keys are made of brass, aluminum, nickel, and steel. The cuts made in a cylinder key are usually squared at the bottom, as shown in Figure 13.

If the key contains cuts on both sides of the blade, the key is most likely an auto key.

Dimple Keys

The *dimple key* is a variation of the cylinder key. Dimple keys are used with very high-security pin tumbler locks. Instead of

FIGURE 14—Parts of a Dimple Key



having the typical notched bitting on the blade, the dimple key has a pattern of impressions or “dimples” drilled onto its surface (Figure 14).

How Keys Are Cut

To make an original key or a duplicate from a key blank, the bitting must be cut into the key blank by machine or by hand. Machine duplication is preferred, since it is quick and inexpensive. Key machines are available to cut all types of keys. If you eventually decide to open your own shop, your purchase of one or more key machines will be your most important investment.

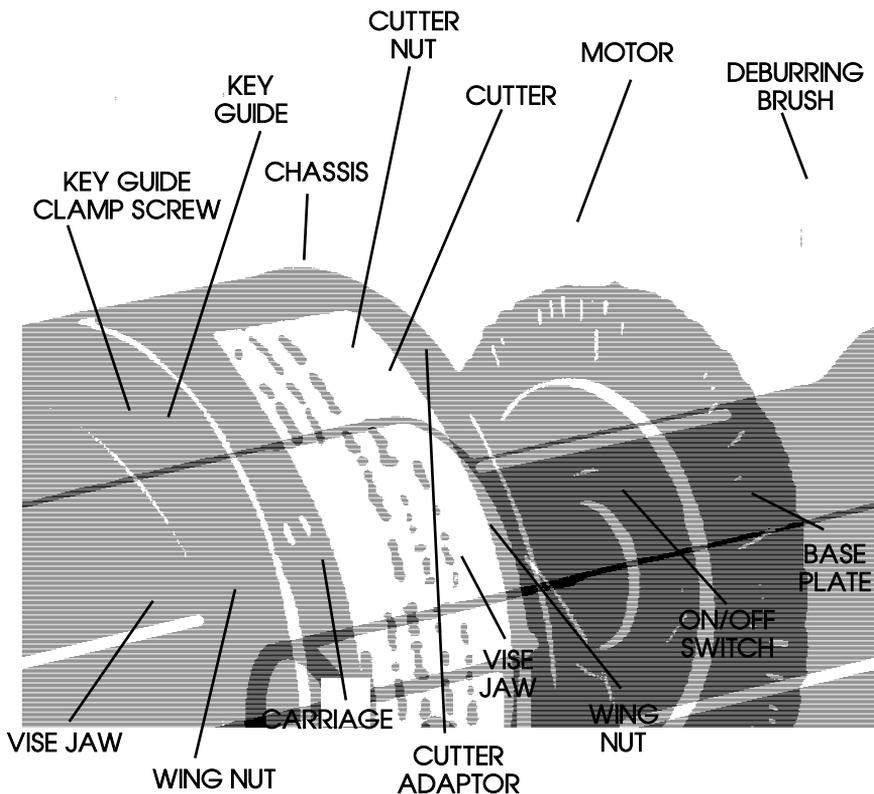


FIGURE 15—A Simple Key Duplicating Machine

A wide variety of key machines is available. A simple, moderately priced cylinder key machine is shown in Figure 15. As a professional locksmith, however, you may also wish to invest in a more expensive model that's also capable of duplicating flat keys. Regardless of the simplicity or complexity of the machine, all key-duplicating machines consist of the following basic parts:

- A *vise jaw* to hold the key being duplicated
- A second *vise jaw* to hold the key blank
- A *cutter wheel* that performs the actual cutting of the blank
- A *key guide* that moves over the bitting pattern of the original key, guiding the cutter wheel as it makes the same pattern on the key blank
- A *deburring brush* that removes rough spots from the finished duplicate

To duplicate a key, you simply clamp the original key and the key blank in place in the vise jaws, and then use the key guide to trace the profile of the key being duplicated. The cutter wheel will cut the key blank according to that profile.

Locksmiths can also cut a key duplicate by hand, which is a time-consuming and skilled procedure. However, hand duplication is sometimes necessary. (*Note:* We'll be covering key duplication and key machines in complete detail in a later study unit. You'll also get a chance to actually make some keys by hand using simple tools.)

Now, before you proceed to the next section of the text, please complete the quiz on the following page.



Locking It Up! 1

At the end of each section in your *Professional Locksmith* texts, you'll be asked to pause and check your understanding of what you've just read by completing a *Locking It Up!* quiz. Writing the answers to these questions will help you review what you've studied so far. Please complete *Locking It Up! 1* now.

Match the terms in Column A with their definitions in Column B.

Column A

- _____ 1. Throat cut
- _____ 2. Blank
- _____ 3. Shoulder
- _____ 4. Bow
- _____ 5. Tip
- _____ 6. Bitting
- _____ 7. Milling
- _____ 8. Blade

Column B

- a. The longest part of a key where the cuts are made
- b. An uncut key
- c. The cuts or notches made in a key blade
- d. The grooves engraved in a key blade
- e. The key handle
- f. The end of the blade
- g. The projection between bow and blade
- h. The "shoulder" in a flat key

Check your answers with those on page 51.

KEY IDENTIFICATION SYSTEMS

How Manufacturers Identify Their Keys

The manufacturers of locks and key blanks use a number of different methods to identify their products. Some lock manufacturers stamp only their names on the bows of their keys. Others stamp both their names and an identifying number on the bows. However, the most obvious way to identify the manufacturer of a particular key blank is by looking at the *bow shape*.

Bow Shapes

Each manufacturer uses a distinctive shape to make its key blanks look different from all others. In general, every key blank made by that manufacturer, no matter what lock it's made to fit, will have the same bow shape. Figure 16 shows the bow shapes used by a number of well-known manufacturers, including *Yale*, *Master*, *Russwin*, *Sargent*, *Kwikset*, *Ilco*, and *Weiser*. Figure 17 shows some popular automobile key bows. You may recognize some of these keys from your own key ring.

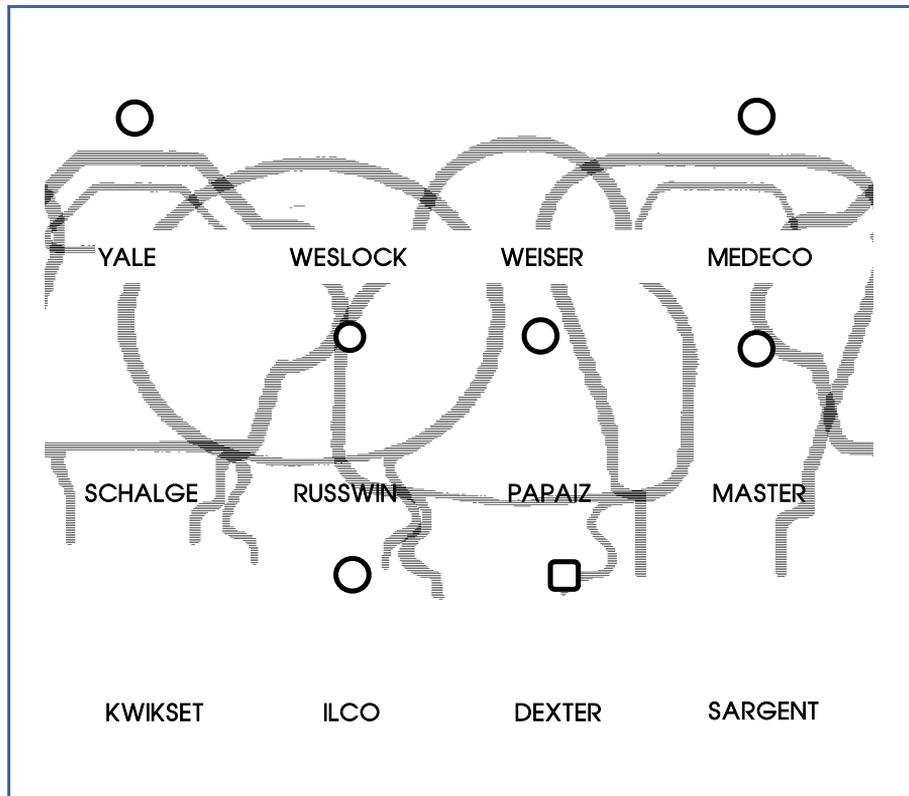
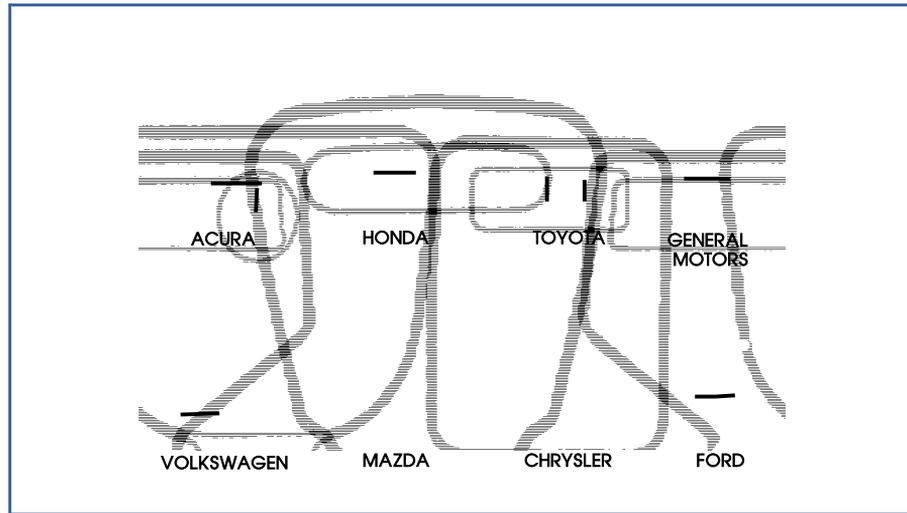


FIGURE 16—Key Bow Shapes of Well-Known Lock Manufacturers

FIGURE 17—Bow Shapes of Popular Auto Keys



As you can see, a key's bow design can greatly aid you in identifying its manufacturer.

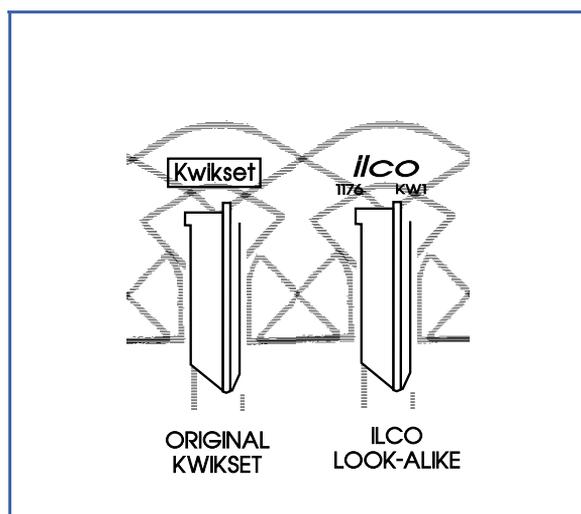
Identifying Numbers and Letters

Many companies manufacture locks and keys, and still other companies manufacture only key blanks. Some companies make key blanks to fit *only their own* locks; others make blanks to fit competitor's locks also. Thus, the identifying numbers and letters on a key blank may actually tell you two things: the manufacturer who made the key blank *and* the manufacturer of the locks that the key blank will fit. Confusing? Not really, with a little more explanation!

Let's look at a real-life example to make our discussion easier. The Schlage Company, the Kwikset company, the Yale company, and the Ilco company are all well-known manufacturers of door locks. They all make key blanks to fit their own locks. These are called *original keys* because they're made by the original lock manufacturer. However, the Ilco company also makes key blanks that fit the locks made by other manufacturers. These key blanks are called *look-alikes* because even though they're made by Ilco, they fit locks made by Kwikset, Yale, and others.

Thus, a key blank made by Ilco that's a "look-alike" for a Kwikset key will have the distinct Kwikset bow shape, even though Ilco's name is stamped on the key blank. The Ilco key "looks like" the original Kwikset key. Figure 18 shows an original Kwikset key blank and a look-alike made by Ilco.

FIGURE 18—This illustration shows an original Kwikset key blank and an Ilco look-alike blank. The two key blanks are absolutely identical in shape and size.



So, how can you tell who made a key blank? The name of the company will usually be stamped right on the key bow. How do you tell whose locks the key will fit? First, try to identify the bow shape. Then, look at the numbers and letters stamped on the key bow. As we mentioned ear-

lier, a key blank contains numbers and letters on its bow that identify its manufacturer. Every key blank that contains the same identifying number will be exactly the same size and shape. Each key manufacturer uses a different system of abbreviations to identify their keys. Let's take a look at some of the most popular systems now.

The Cole System

The Cole Company uses an abbreviation that usually contains one or two letters and one or two digits to identify keys. The letter or letters are the initials of the manufacturer. So, for example, *Y* stands for *Yale*, *SC* stands for *Schlage*, and *M* stands for *Master*. (Other abbreviations are shown in Figure 19.) By looking at these letters, you can instantly determine whose locks the key will fit. The digit corresponds to a particular model of lock made by that manufacturer. So, *M1* refers to a particular Master lock, *M2* refers to another, *M3* to still another, and so on.

The EZ System

Although manufacturers use many different systems for identifying keys, a Cole-type system is used by several. This is because the Cole system is easy to understand and use. The *EZ system* is a sort of “universal” key identification system that has been adopted by many manufacturers. The EZ system is based on the Cole system. An EZ identification number contains one or two letters and one or two digits. The use of the EZ identification system makes it easier for manufacturers to sell their keys.

Abbreviation	Manufacturer	Abbreviation	Manufacturer
AM	American	M	Master
AR	Arrow	NA	National
CG	Chicago	OL	Olympic
CO	Corbin	P	Penn
DE	Dexter	PZ	Papaiz
EA	Eagle	RU	Russwin
EL	Elgin	S	Sargent
FA	Falcon	SC	Schlage
FR	Fort	SE	Segal
HR	Harloc	T	Taylor
IN	Ilco	VR	Viro
KW	Kwikset	WR	Weiser
L	Lockwood	WK	Weslock
LO	Lori	Y	Yale

FIGURE 19—These are some of the abbreviations for manufacturer's names used in the Cole or EZ system.

As a working locksmith, you'll probably frequently hear references to *EZ numbers*. By laying in supplies of common EZ keys, you'll save the time that would be spent searching for them under other names and keep your key-blank inventory within manageable (and economical) limits.

The Ilco System

Since the Ilco Company was one of the first manufacturers to make key blanks for locks made by other manufacturers, their key identifying system is widely recognized. The Ilco system generally uses four numbers along with several letters as either prefixes or suffixes. So, for example, Ilco key blank #1176 fits a Kwikset lock; Ilco blank #1092B fits a Master lock; and Ilco blank #S1167FD fits a Ford automobile lock.

Note that with the Ilco system, unlike the EZ system, you can't tell who the manufacturer of the lock is at a glance. The letters used in the identifying numbers aren't necessarily the initials of the manufacturer. However, because Ilco manufactures "look-alike" keys, the bow of the key blank will often be the same shape as that of the original key. Thus, since Ilco's key blank #1176 is made to fit a Kwikset lock, it has the same bow shape as a Kwikset key, even though the blank is made by the Ilco Company. Are you starting to get the picture?

Generic Key Blanks

There are a number of companies that make keys to be used in other manufacturer's locks, as we've already discussed. Some of the best-known are Ilco, Star, Taylor, and Dominion. Look-alike keys manufactured by any of these companies will usually have the same bow shape as original keys. However, some companies that make blanks for other manufacturers' locks don't use the "look-alike" system. Some companies use their own bow shape no matter what locks the key blanks are made for. These keys are referred to as *generic key blanks*. An example of a generic key blank maker is the ESP Company. ESP makes key blanks for a number of different manufacturer's locks, but the bow shape of the ESP blank doesn't necessarily match that of the original manufacturers. Only the ESP name will appear on the blank, along with some identifying numbers. You'll need to use the numbers to identify each key.

Generic key blanks can be manufactured quickly and easily without the difficulty of imitating a variety of bow shapes. Thus, generic key blanks are usually quite inexpensive.

Neuter Key Blanks

There are many locksmith suppliers and ordinary hardware manufacturers that produce *neuter key blanks*. Neuter blanks are made to be used in *only one* retail store or locksmithing business. Neuter key blanks contain no manufacturers' information or identifying bow shape at all, only the name and/or phone

number of the retail store where they were sold (Figure 20). Thus, when a customer needs a new key, he or she must return to that particular store to get a duplicate made! This is a common selling tool used by many hardware stores and locksmiths.

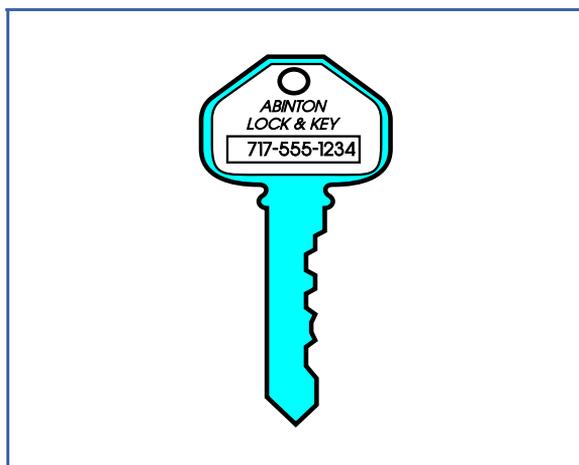


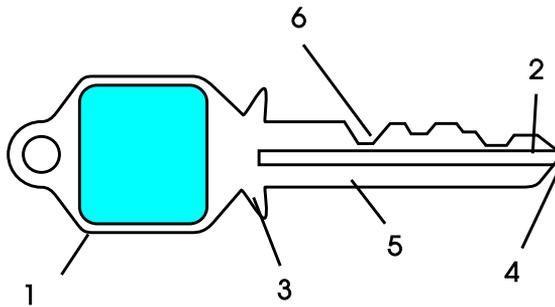
FIGURE 20—A neuter key contains no identifying information, only the name and phone number of the place where it was purchased.

In addition, the lack of identifying information on a neuter key makes its lock very secure. If the key was stolen, the thief wouldn't be able to guess what lock the key is for.



Locking It Up! 2

On the lines below, enter the names of the various key parts indicated by the numbers in this drawing.



1. _____

4. _____

2. _____

5. _____

3. _____

6. _____

7. The key illustrated above is an example of what type of key?

Check your answers with those on page 51.

FINDING A MATCHING BLANK FOR A CUSTOMER'S KEY

Where Do You Start?

When a customer comes into your shop and asks for a duplicate key to be made, there are a number of techniques you can use to determine what blank to use. However, the first step in this process is always to determine whether it's legal for you to duplicate the key.

It's important to be aware that some keys are deliberately stamped with the warning "DO NOT DUPLICATE" (or a similar warning) for a variety of security reasons. The warning will appear on the key's bow (Figure 21). For example, a hotel, motel, hospital, school, or business may issue a key to an employee so that he or she can have access to various rooms during working hours. However, the management would not want the key duplicated by the employee, since he or she could then have access at any time.

In addition, certain keys are actually illegal to duplicate. For example, post office box and safety deposit box keys can't be legally duplicated without proper authorization from the post office or bank.

A locksmith must not duplicate any of these keys at any time for anyone without proper authorization. If a customer presents you with a "DO NOT DUPLICATE" key and asks for a duplicate to be made, insist that the customer provide you with a *waiver of responsibility* form printed on the letterhead of the key's owner. (Figure 22 provides an example of this document.) If you copy a "DO NOT DUPLICATE" key without this authorization form, you could ultimately be liable for any damages or losses that occur as a result. Always protect yourself!

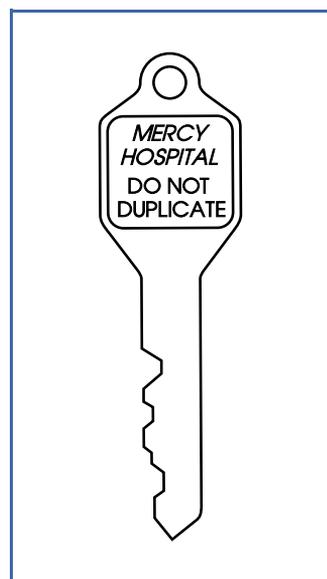


FIGURE 21—You should never make a duplicate for a key like the one illustrated here unless you're specially authorized to do so.

FIGURE 22—This waiver of responsibility should be signed by your customer before you copy a key stamped “DO NOT DUPLICATE.”

MERCY HOSPITAL
100 Main Street
Anytown, USA

Office of the Administrator

June 6, 19XX

To whom it may concern:

Please provide two (2) copies of the key presented by the bearer of this letter, even though the key is stamped “DO NOT DUPLICATE.” Duplicates are required for the normal functioning of Mercy Hospital.

Thank you for your assistance.

Sincerely,

Walter D. Wilson

Walter D. Wilson

Identifying the Manufacturer

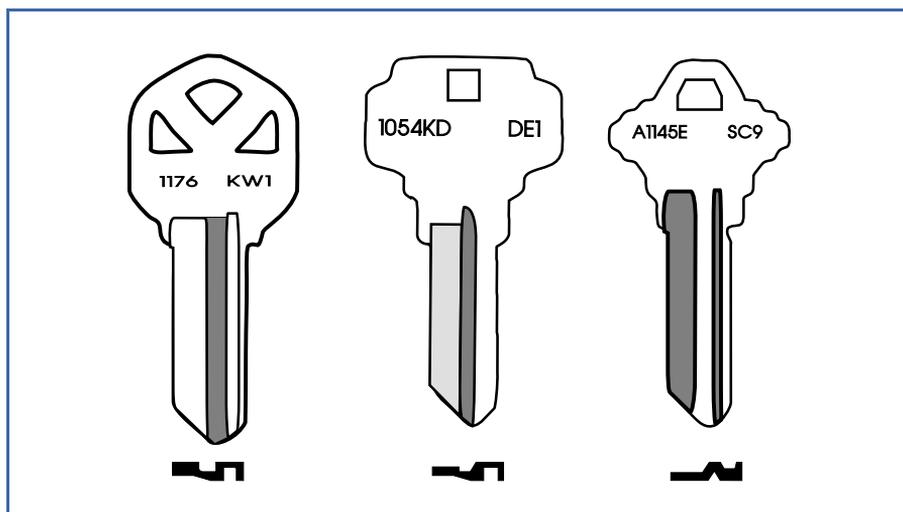
Once you’ve determined that it’s OK to duplicate the customer’s key, the next step is to identify the original manufacturer of the customer’s lock. You’ll always start by looking at the customer’s key for the manufacturer’s name on the key bow.

Once you know who made the key, there are two reference guides that most locksmiths use to identify the proper key blank to use. The first guide is the manufacturer’s catalog; the second is a cross reference directory. Let’s look at each of these useful resources now.

Key Blank Catalogs

Whenever a locksmith needs to purchase key blanks, he or she will order them through a manufacturer’s catalog. However, these catalogs are also very useful for identifying key blanks. Key catalogs typically contain *silhouettes* (outlines) of the keys made by that manufacturer. The silhouettes are exactly the size and shape of the real-life keys they represent (Figure 23). The

FIGURE 23—Silhouettes in a key blank catalog are exactly the size and shape of the real keys they represent.

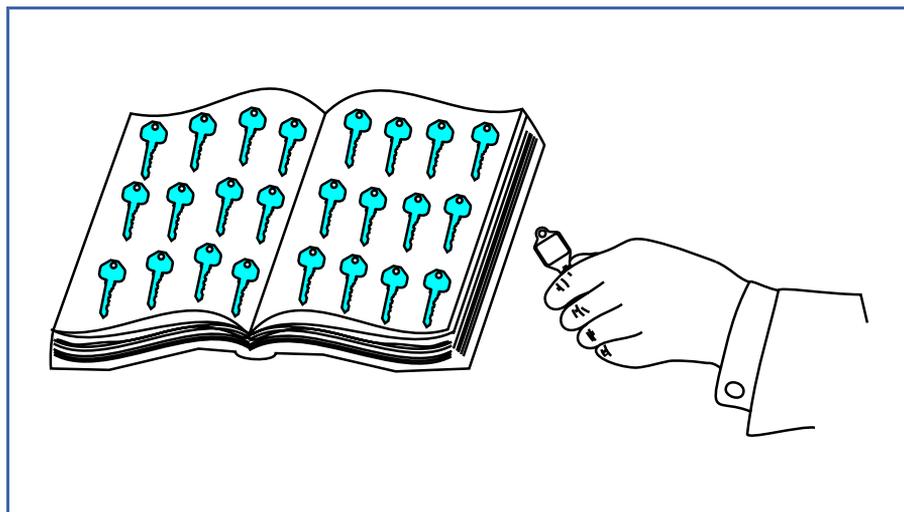


bow shapes, blade length, and the milling grooves for each key blank are clearly illustrated. Under each silhouette is listed the manufacturer's stock number for the key illustrated.

Under or next to each silhouette you'll also find an *end view* of the key blank. This is the way the key looks when you hold it up straight in front of your eyes and look directly at the end. Always check the end view in the catalog with your actual key blank to be sure that the milling grooves match. To do this, turn the key *face down* on the catalog page (that is, the side with the information on it should be facing down.) Now, lift the key up from the page and stand it on end. The end of the key should cover and match the end view in the catalog. Compare the real key's tip to the illustration in the catalog to be sure they match.

Now, suppose you need to identify a customer's key in order to make a duplicate. You've already determined the manufacturer, either from the name stamped on the key or from the shape of the bow. All you need to do now is consult that manufacturer's key catalog to find the blank you need. First, check the identifying number on the blank; then, look up that number in the index at the beginning of the catalog. (The index contains the numbers of all the key blanks in the catalog and a listing of the pages where they appear.) Find your number in the index and see what page that blank is pictured on. Then, go to that page and compare your real key to the silhouette. You can lay the key right on the page over the silhouette. It should match exactly! (Note: When you compare a key to the silhouettes in a catalog, you must hold the key with the printed side of the bow face-down. Thus, you compare the *back* or *reverse* side of the key to the pictures in the catalog.)

FIGURE 24—Lay the key you're trying to identify over the silhouettes in a key catalog until you find a match.



If you know the manufacturer, but the key contains no identifying number (or if the key is too worn to read) simply flip through the catalog pages and look for a picture that resembles your key. When you find a possible match, lay the key over the silhouette on the page to see if it matches in size and shape (Figure 24). Finally, note the manufacturer's number given under the matching silhouette. This is the number of the matching blank that you'll use to make your customer's duplicate.

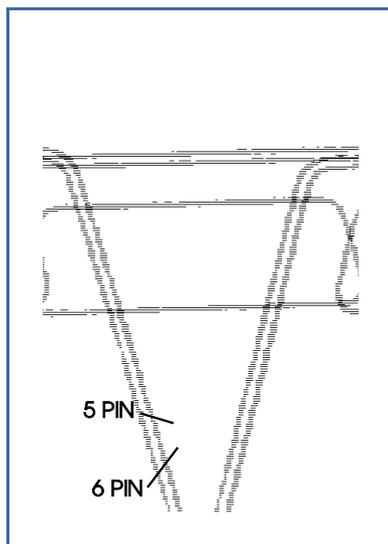


FIGURE 25—This silhouette represents two key blanks. The two blanks are exactly the same except for their lengths.

Some key silhouettes will contain more than one version of the same key. Look now at Figure 25. This figure shows a silhouette for a 5-pin key blank (for locks with five pins) and also a 6-pin blank (for locks with six pins). The two key blanks are exactly the same except for their length. Depending on the lock the customer has (that is, whether it has five or six pins) you'll choose either of those two key blanks.

Cross-Reference Directories

A *cross-reference directory* is a useful resource that can help you identify keys made by a variety of different manufacturers. A cross-reference directory lists the numbers of all the key blanks made by a given manufacturer; then, the directory lists the

corresponding numbers of key blanks made by several other manufacturers. For example, by looking up one Ilco key blank number, you can instantly find the corresponding Star, Dominion, Taylor, or Cole key blank numbers. A cross-reference directory is especially useful in a busy locksmithing shop when you run out of a particular key blank. By looking the blank number up in the directory, you can find an alternative key blank that will fit your customer's lock. A section of a typical cross-reference directory is shown in Figure 26.

A cross-reference directory is an essential tool in any locksmith's business. Ask your key-blank suppliers for any cross-reference literature they may have (they may even have free literature available). If no free information is available, consider investing in a universal cross-reference directory, which puts the whole world of key blanks at your fingertips in one volume. Among many other benefits, such a directory lets you manage your key blank inventory efficiently and economically.

Once you've determined the correct manufacturer and model number of the customer's key, you're ready to make a duplicate. Simply locate the correct blank in your shop inventory and cut the key.

ICS CROSS-REFERENCE DIRECTORY						
Ilco	Cole	Dominion	ESP	EZ	Star	Taylor
1001EB	CO3	01EB	CO3	CO3	5CO2	21EB
1001EN	CO7	01EN	CO7	CO7	5CO1	21EN
1001GH	CO67	01GH	CO97	CO97	5CO13	K22
1003M	CO106	03M	CO106	CO106	5AU1	22R14
1004KL	54KL	04KL	L37	—	71L2	54KL
1010N	S43	10N	S68	S68	5SA7	51S
1011	RU1	11	RU1	RU1	5RU1	55
1011D1	RU20	11D1	RU45	RU45	5RU7	57-1D

FIGURE 26—This illustration shows a sample section from a page in a key blank directory.

Working With an Unknown Key

We've already discussed how to handle a request for a duplicate key when the customer's key is readily identifiable. However, what do you do if the key brought to you for duplication is worn so smooth that no identifying information remains visible on it? Answering that question will be the business of this section of your text.

Identifying the Manufacturer

Let's assume now that a customer has brought you a key to be duplicated that contains no identifying marks at all. Since key identification procedure is essentially a process of elimination, the best place to start is with the key bow. In time, you'll be able to recognize the products of the larger key and key-blank manufacturers by bow shape. Until that time, however, you can use the bow information in this study unit to assist you.

Look at the bow shape to try to determine the key's manufacturer. If you're able to determine the manufacturer from the bow shape, you have two options available. You can flip through the pages of that manufacturer's catalog until you find a picture that matches your customer's key, or you can compare the key to real blanks in your shop.

If you can't figure out who made the key, then your only choice will be to try to match the customer's key to one in your key blank inventory. When you're actually working as a professional locksmith, your own work experience will help you choose a likely match. Until then, however, you'll probably have to use a trial and error method! Note, though, that this method will help you gain experience in recognizing important key characteristics.

The following information describes the techniques used to determine whether a key blank is an exact match for a customer's key.

Matching Key Characteristics

Once you've chosen a key blank from your inventory that you think may be a match for your customer's key, you're ready to start comparing *key characteristics*. These characteristics include

points of size and shape that can be used to match keys with great precision.

With a cylinder key or a flat key, the following general characteristics should be compared closely:

Blade Length. The length of a key's blade is measured from the bow to the tip. To check blade length, align the customer's key and your key blank, and check to be sure that the keys are

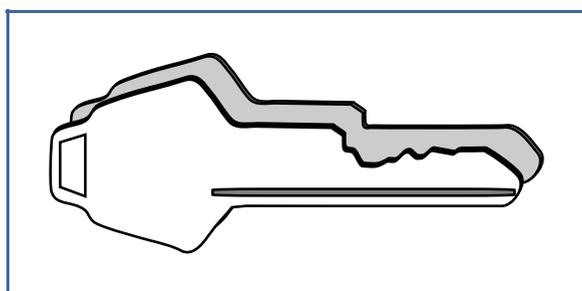


FIGURE 27—Compare the key blade length by aligning your customer's key with the blank.

identical in length (Figure 27). Be sure that the shoulders are exactly equal, also. Note, however, that the bows don't have to exactly match.

Note that it is possible to "trim" a too-

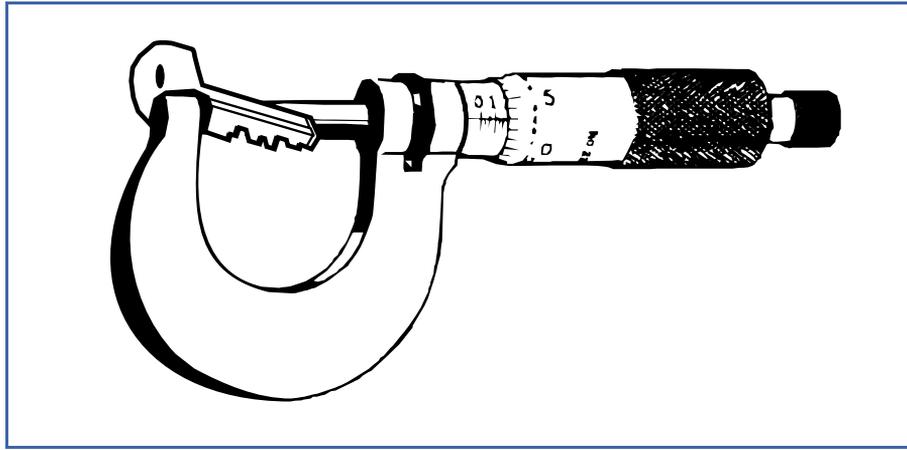
long key blank by filing the end (provided all other characteristics are identical). However, this technique isn't recommended unless absolutely necessary.

Blade Width. Key blade width is the distance across the blade. Check the width of the key blades at the same time you check the length. Note that the height of the key blades must also match exactly.

In an emergency, you can make a duplicate key from a blank that is *slightly* narrower than the key you're duplicating. Such a skinny duplicate won't fit snugly in the keyway, but it will probably still work. However, this practice isn't generally recommended. You should always attempt to make a duplicate key exactly match the original.

Key Thickness. When comparing a flat key to a blank, the thickness is an important characteristic that must be checked. Ideally, to check the thickness of a customer's flat key against the thickness of your blank, you should measure the two key blanks with a micrometer (Figure 28), which is capable of measuring objects to the nearest thousandth of an inch.

FIGURE 28—This illustration shows a key's thickness being measured with a micrometer.

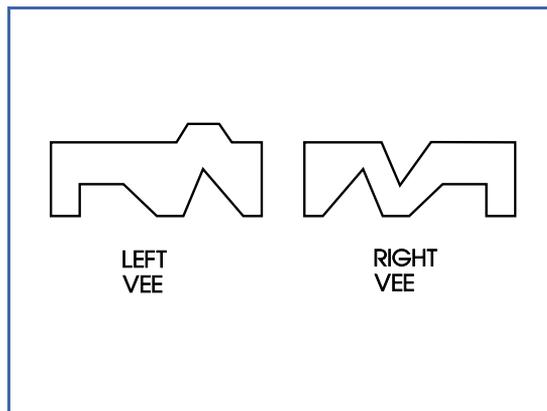


Tip Shape. With a cylinder key, check to make sure that the shape of the key tips is identical. Align the two keys and look directly at the ends. If they don't seem to match up, check to make sure that the keys are pointing in the same direction. If they still don't match, you've selected the wrong blank.

Groove Length and Shape. The milling, or grooves, on a cylinder key and key blank must match exactly. This means that

there must be the same number of grooves on each side of both key and key blank, and the grooves must be the same length and shape. The five standard groove shapes were shown earlier in Figure 7. Note that combinations of these standard shapes are

FIGURE 29—This figure shows two possible milling groove variations, the right vee and the left vee.

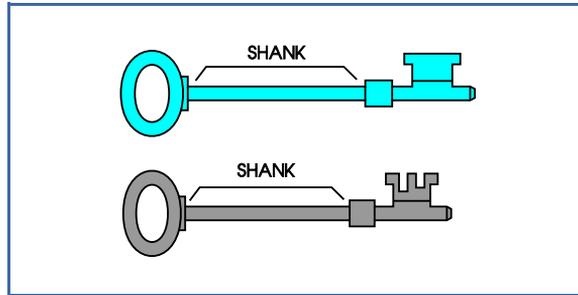


possible, providing such variations as the right vee and left vee in Figure 29.

If the key to be duplicated is a bit or barrel key, the dimensions of the key blank must match the customer's original key in the following four areas: shank, post, tip, and bit.

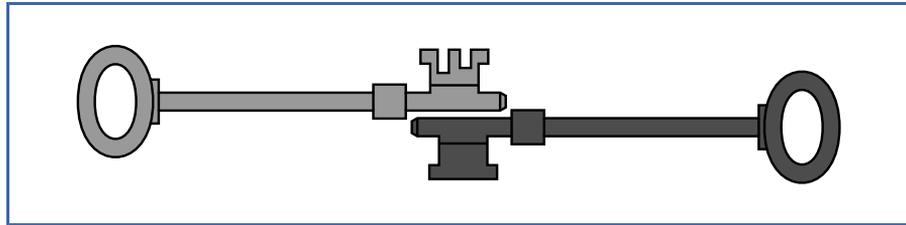
Shank. The shanks of the bit key and bit-key blank must be the same length (Figure 30). This is verified by laying the key to be duplicated on top of the blank.

FIGURE 30—Compare the shanks on a bit key and bit key blank to be sure their lengths are the same.



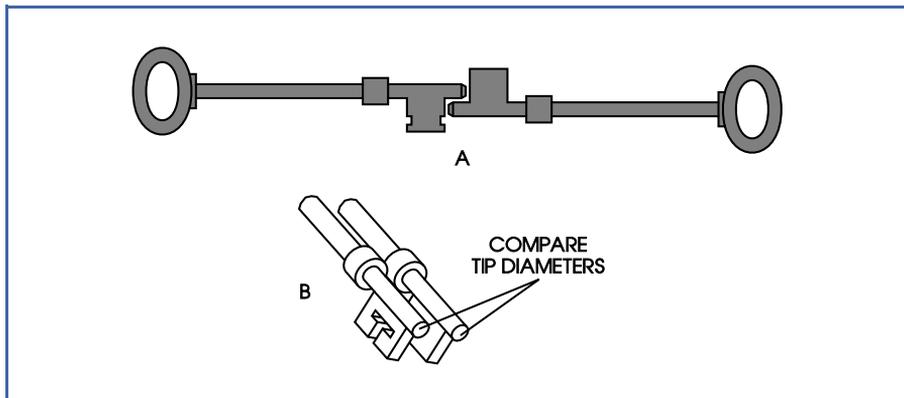
Post. Matching the dimensions of the post is critical to the smooth operation of the duplicate bit key. The post must be checked for proper length (Figure 31). Check by holding the key and blank together, tip to tip.

FIGURE 31—The posts should be the same length.



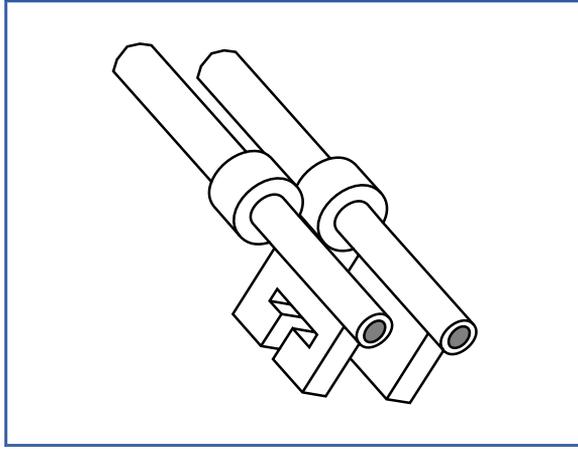
Tip. Check that the tips of the customer's key and the blank are the same length (Figure 32A) and that they have the same diameter when viewed from the end (Figure 32B).

FIGURE 32—Compare the tips of the bit key and bit key blank to be sure they're the same length as shown in 32A. Then, compare the tip diameter as shown in 32B.



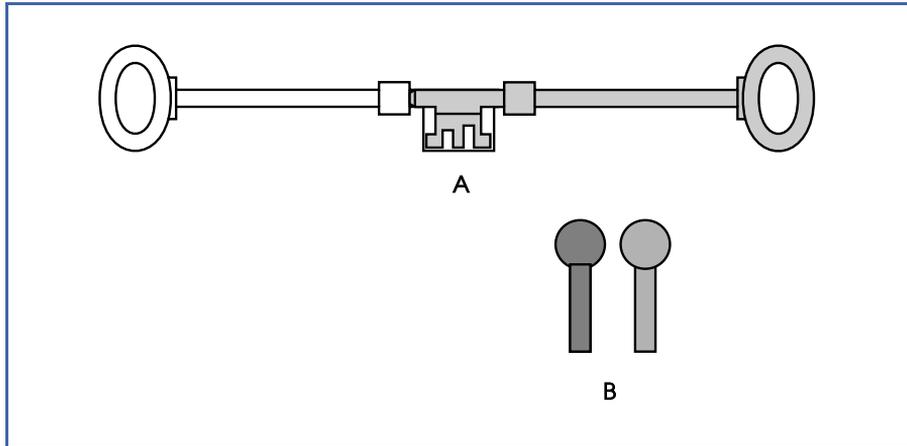
The hollow tip of a barrel key must be checked to be sure that the inside diameter matches that of the key blank. The easiest way to make this comparison is to hold the two keys so that the tips touch (Figure 33).

FIGURE 33—Compare the tip diameters of two barrel keys to check for a match.



Bit. Bit length, height, and thickness are critical dimensions in a bit key. Check the key to be duplicated against the blank for a match in all three areas (Figure 34).

FIGURE 34—Overlap the bit key and bit key blank as shown in Figure 34A to check the length and width of the bit. For bit thickness, compare key and blank head on, as shown in Figure 34B.



By using the key characteristics listed here, and with time and a little experience, you'll soon have no trouble matching a blank to any key!

Your Key Blank Inventory

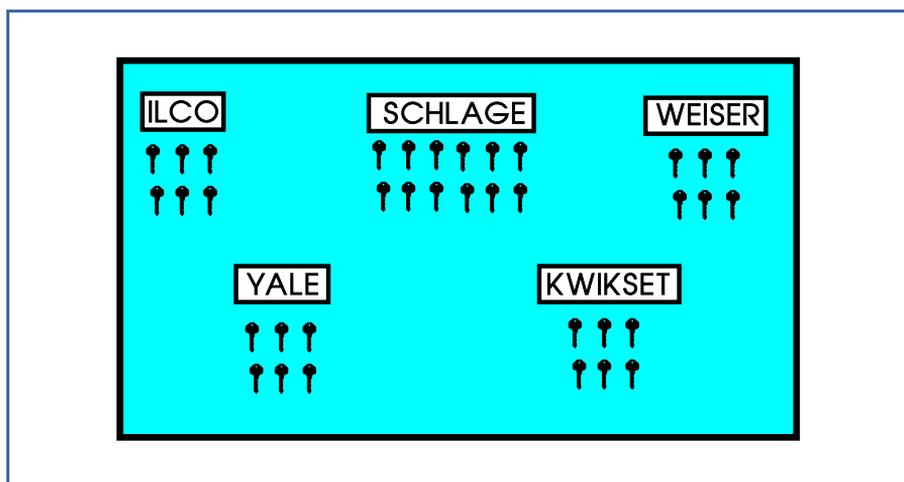
Your first purchase of key blanks is probably still a bit in the future, but it's important that you understand how to manage an inventory of key blanks in a busy shop.

As we mentioned in an earlier study unit, key duplication is the most commonly-requested service in a locksmith shop. Your supply of key blanks will constantly be in use as customers come in and out each day. For this reason, your stock of blanks must be organized and orderly. You should be able to

find the blanks you need quickly and easily, and you should have enough blanks on hand to make duplicates for all the most common keys.

Figure 35 shows a possible system for organizing key blanks in a shop. The blanks in this illustration are hung on an easy-to-see wall display, and are organized according to lock manufacturer (Schlage, Kwikset, Yale, etc.). The manufacturer's areas on the display are organized alphabetically. Note that generic keys are placed under lock manufacturers' names, not under the name of their own manufacturer. Thus, any time you need a Kwikset key, you just look under Kwikset. *All* keys that will fit a Kwikset lock are displayed there.

FIGURE 35—This illustration shows a system for displaying key blanks in a busy locksmithing shop.



Key blanks are arranged on a wall display under the names of each lock manufacturer. Note that all the keys are hanging in the same direction, with the “bitting side” facing to the right. This is the same way that keys are displayed in a key catalog. This method of display makes it easier to compare key blanks quickly by sight.

The keys are all hanging on long hooks. When the pile of key blanks begins to get “close to the wall,” they need to be refilled or reordered. This makes it easy to tell at a glance when blanks need to be ordered.

All automobile key blanks are placed separately, organized according to car model.

If a locksmithing shop owns a van, it will contain a supply of key blanks, too. This makes it easy to make duplicates instantly when on a road call. In a van, which is constantly moving and bumping over the highways, key blanks aren't hung on the walls. Instead, they're kept in carefully coded cases that can be opened when needed.

What Blanks Should You Buy?

Determining just what key blanks to stock in your inventory is a difficult choice. Since there are so many key blanks available, it's important to determine which ones are most often requested by customers. Otherwise, your investment in both cash and storage space will be wasted on a lot of blanks that don't sell! By giving a little thought to your key blank purchases, you can limit the size of your stock to a manageable number.

There are three good sources of information on what key blanks are best-sellers: locksmith suppliers, your competition, and your own experience. Let's look at each of these in turn.

Locksmith Suppliers. Locksmith suppliers can be an enormous help in deciding what merchandise to stock, especially to a beginner. These suppliers want you to succeed, because if you make money, so will they. Call a locksmith supplier and ask for assistance. They'll be happy to send you catalogs and other literature, as well as make recommendations on which blanks you should definitely inventory, and which ones you can get by without. Most suppliers are informed, experienced, and conscientious, and they will gladly draw on their own experience to help get you started.

Your Competition. Visit one or more of the other locksmith shops in your area and order a couple of duplicate keys. Note what brand of blank the locksmith uses. Which manufacturers does his key-blank display feature? This information may be very useful. Use your own judgment as to whether or not to reveal yourself as a new competitor. Surprisingly, though, you may find your potential competitors willing or even eager to talk about their businesses, including their preferences in blanks.

Your Own Experience. In your daily work as a locksmith, you'll begin to notice what blanks are used most often and which ones you reorder most frequently. Try to keep careful track of the blanks you sell, and periodically make notes on which ones sell the best. Then, when it's time to reorder, you'll know exactly what you need!



Locking It Up! 3

Indicate whether each of the following statements is True or False.

- _____ 1. The last step in key duplication is to determine whether you can legally make the duplicate.
- _____ 2. *Silhouettes* are exact-size outlines of keys in a manufacturer's catalog.
- _____ 3. An *end view* of a key blank is what you see when you hold it up straight and look directly at the bow.
- _____ 4. The length of a key's blade is measured from the bow to the shoulder.
- _____ 5. When making a duplicate key, the bows of the customer's key and the blank must match.
- _____ 6. Key blade width is the distance across the blade.
- _____ 7. The best way to compare the thicknesses of two flat keys is to use a micrometer.
- _____ 8. The five standard types of key blades are the square, half-round, vee, right-angle, and left-angle.

Check your answers with those on page 51.

IDENTIFYING UNUSUAL KEYS

The Mark of a True Professional

Hundreds of years ago, keys were finely crafted, highly detailed, and sometimes made from precious metals. For this reason, people prized these keys and saved them carefully. Many examples of very old keys exist today, and much has been written about them. However, in later years (about 100 years ago), keys began to be mass-produced. People of that time felt that their keys were ordinary tools, and threw them away when they were no longer needed. In addition, many keys were melted down over the years to use for scrap metal.

While many old keys were thrown away or scrapped, many still survive! You can never be sure when a customer is going to come into your shop and ask you to identify some strange-looking object. While you're obviously never going to see an ancient key outside of a museum, it's perfectly possible that a customer could come in with a 100-year-old key and ask you to identify it. This may happen quite often, as unidentified keys are always turning up in old homes. The key's owner may have no idea what the key is even used for—a door, a cabinet, a desk, or a clock.

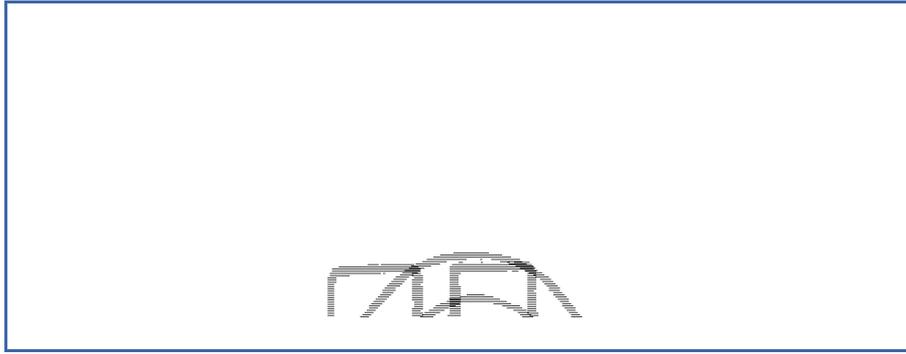
It certainly isn't expected that you be an expert in antique keys. However, there are a few common types of strange, old, or obsolete keys that you should be able to recognize. Being able to identify unusual keys will separate *you* from the average locksmith. Your knowledge will impress your customers and enhance your professional reputation!

Strange, Rare, and Obsolete Keys

Now, let's take a brief look at some unusual keys. Many of the keys described here are popular collectibles, and some (particularly railroad keys) are quite valuable.

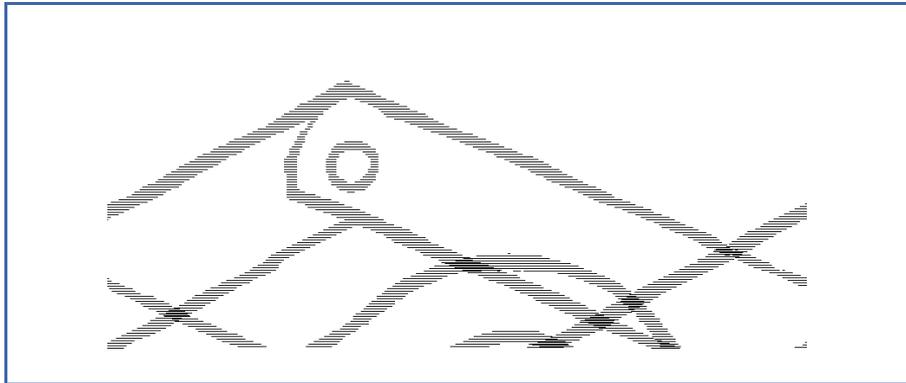
Gate Keys. The keys used in old gates were very large (between four and six inches long) and were usually made of iron (Figure 36).

FIGURE 36—Gate keys were often made of iron and were usually between four and six inches long.



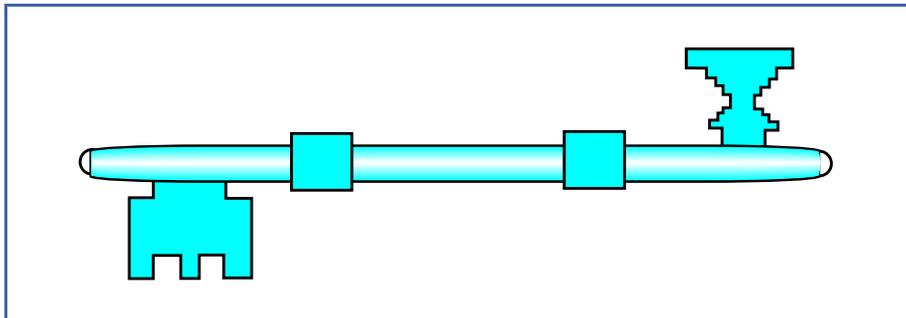
Folding Door Keys. One relatively unusual key you may see is a *folding* door key. Many old wooden doors were very thick, and in addition, the lock would often be mounted on the surface of the door. For this reason, long keys were necessary to reach the lock mechanism inside. Because it was inconvenient to carry such a long key in a pocket, the keys were jointed to fold in half (Figure 37).

FIGURE 37—This type of door key folded in half for convenient carrying.



Double-Ended Keys. Genuine double-ended door keys are very rare and quite valuable. These keys contain two different keys, one at each end of the shank (Figure 38). Most double-ended keys were made in Europe, but some have been found in the United States.

FIGURE 38— Double-ended keys are quite rare.



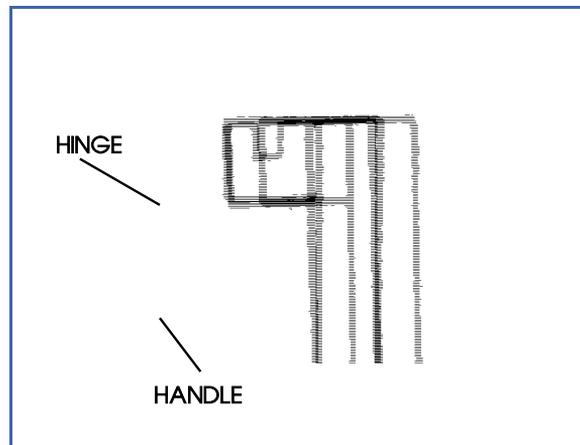
Cabinet Keys. Cabinet keys are bit or barrel keys that were used to open cupboards, cabinets, chests of drawers, and desks (Figure 39). Shorter versions of the cabinet key (also barrel keys) were used to unlock trunks, padlocks, luggage, and books or diaries. Just about every lock maker made cabinet keys at one time or another, so these keys are commonly seen.

FIGURE 39—Cabinet keys were used to open drawers, cupboards, and desks. Both bit and barrel types are shown here.



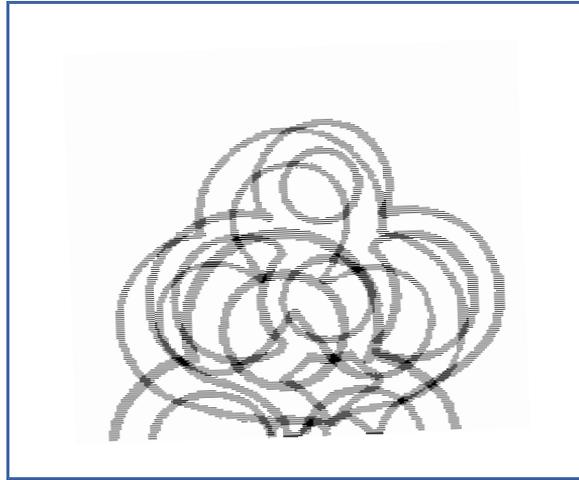
Years ago, some cupboards and chests of drawers were designed without handles or pulls on the doors or drawers. Instead, the keys made to open these cabinets had a built-in handle attached. After the key was inserted, the hinged bow folded down to create a handle to pull the door or drawer open (Figure 40).

FIGURE 40—After this type of cabinet key was inserted into the lock, the hinged bow folded down to provide a handle to pull the door or drawer open.



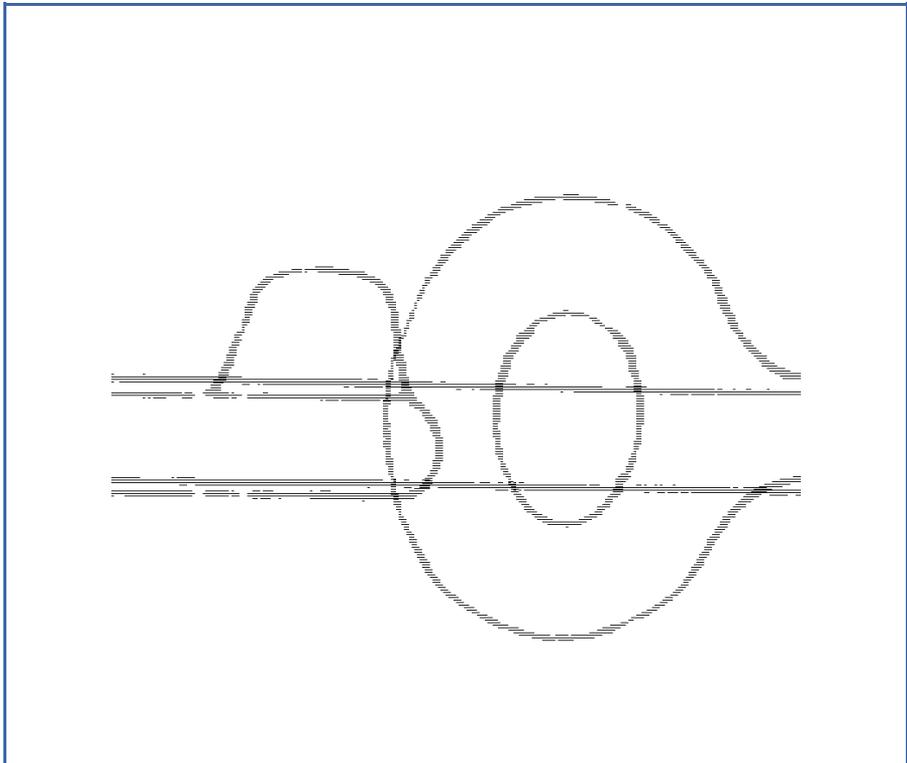
Another common type of cabinet key is the *cloverleaf key*. A cloverleaf key is simply a cabinet key with a bow in the shape of a three-leaf clover (Figure 41).

FIGURE 41—The cloverleaf cabinet key has this distinctive bow shape.



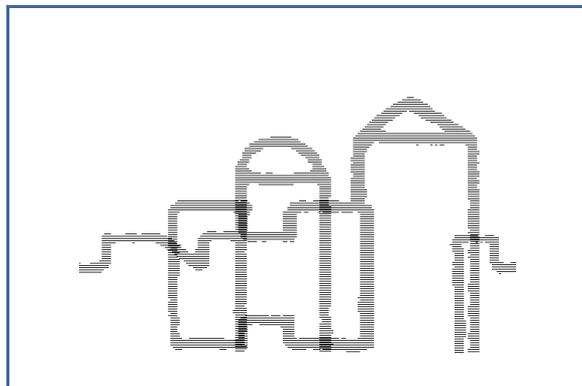
Chest Keys. Many years ago, before closets were standard in most houses, people kept clothing, extra blankets, and momentoes locked in large wooden boxes called *chests*. Most chests were handmade, and contained simple homemade locks. The locks were designed mainly to keep small children from getting into the chests. The keys used with these locks are generally very simple, and tend to resemble bit key blanks (Figure 42).

FIGURE 42—Many old chest keys look much like bit key blanks.



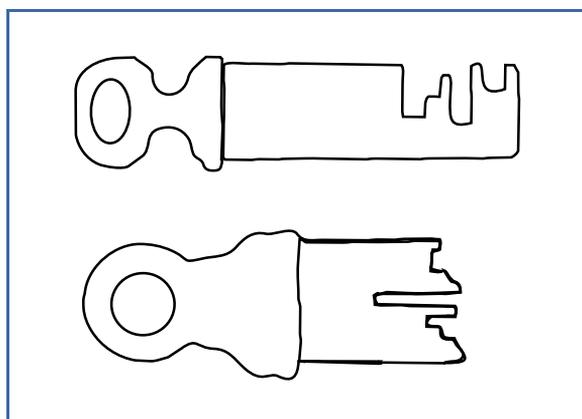
Pocket Door Keys. Sliding *pocket doors* are found in many old homes. These doors were usually located between a hall and a dining room, or between dining room and parlor. The doors slid back into the wall so that all that could be seen was the edge of the door. Pocket door keys are generally very short, and many folded in half (Figure 43). This was so that the key could be folded down and left in the door lock when it was slid into the wall.

FIGURE 43—Pocket door keys can be folded in half and left in the lock when the door is slid into a wall.



Safe Keys. Before the combination lock was perfected and readily available, many bank safes contained key-operated locks. Safe locks used the type of key shown in Figure 44.

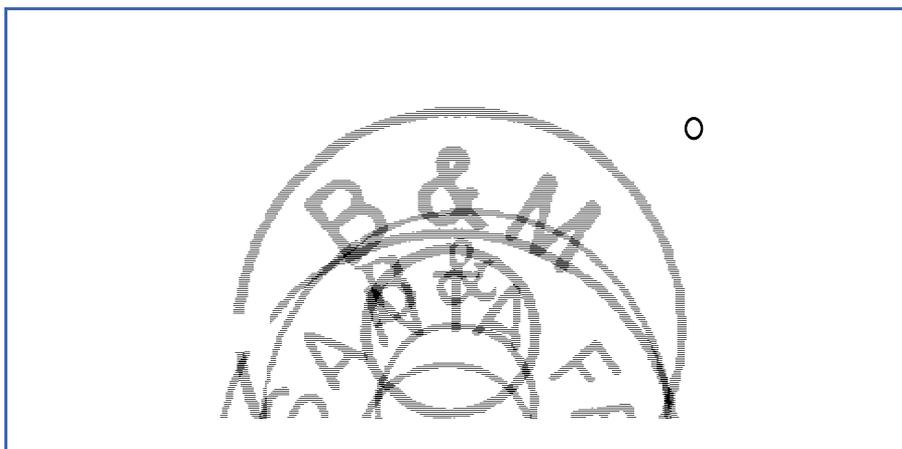
FIGURE 44—A safe key is shown here.



Railroad Keys. Railroads used a variety of keys for different purposes. The railroad key most prized by collectors today is the *switch key* (Figure 45). Switch keys are large barrel keys that were used by railroad switchmen to unlock gates and divert boxcars from one track to another.

Other railroad keys include keys to open boxcars, cabooses, Pullman sleeping cars, and padlocks. Most of these keys are standard-type bit keys. Many railroad keys are stamped with the identifying initials of the railroad system that used them, such as B & O (Baltimore and Ohio Railway), NYCS (New York Central System), Santa Fe (Atchison, Topeka, and Santa Fe Railway), and dozens of others. The collecting of railroad keys and locks is a popular hobby.

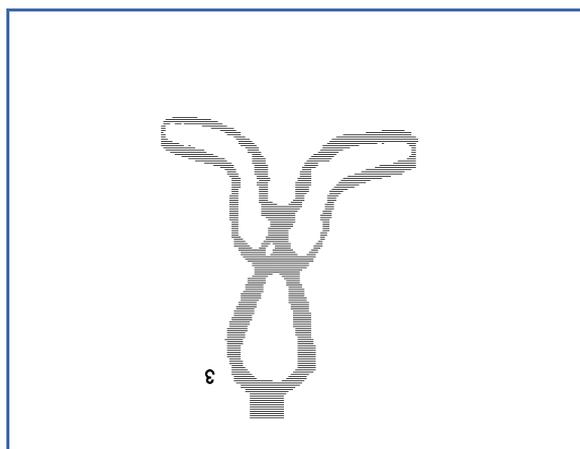
FIGURE 45—Several railroad switch keys are shown here.



Night Watchman's Keys. Years ago, night watchmen patrolled the streets of cities and towns, keeping an eye out for disturbances, crimes, and fires (much like our police do today). To make sure each watchman faithfully completed his rounds, several systems to check on the watchmen were devised. In one of these systems, check stations were located at various spots along the watchman's nightly route.

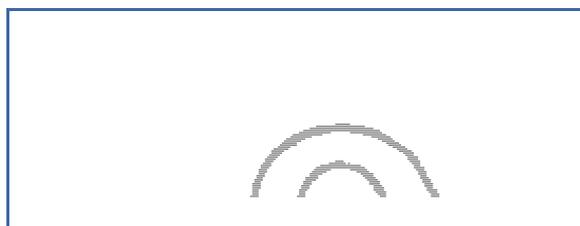
Each station included a metal box to which was attached a special key on a chain. The watchman carried a clock with him that contained a small piece of paper. As he reached each station, the watchman would take the key out of the station box, insert it into the clock, and turn it. The key's number would then be stamped on the paper inside the watchman's clock. In this way, the watchman's boss could determine if he made all the stops on his rounds. A typical night watchman's key is shown in Figure 46.

FIGURE 46—Each key on the night watchman's rounds was stamped with an identifying number.



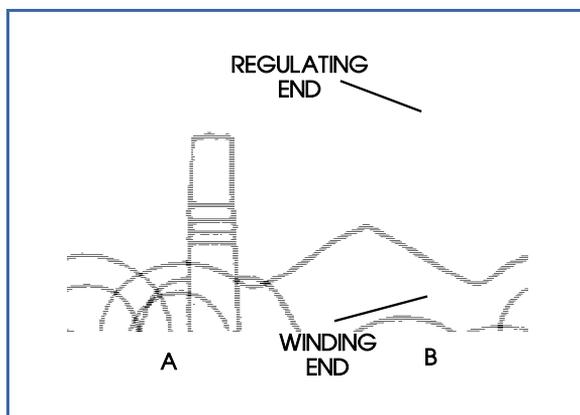
Sewing Machine Keys. A sewing machine key contained a triangular or square end (Figure 47) and was used in the locks found on sewing machines, pianos, and some other musical instruments.

FIGURE 47—This type of key was used to open sewing machines and pianos. Note the triangle-shaped end.



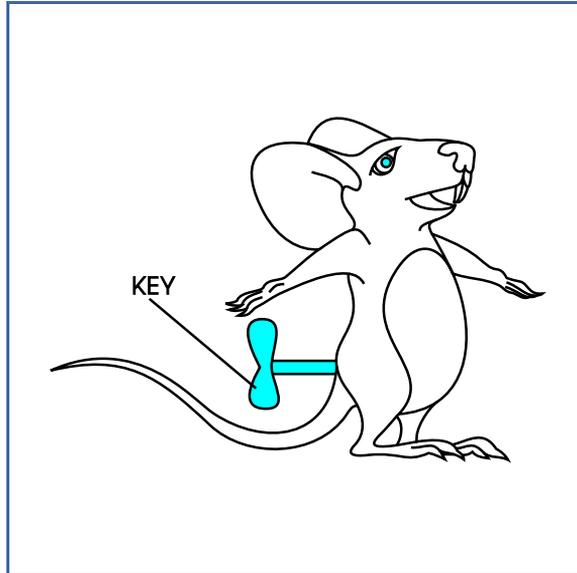
Clock Keys. Clock keys are used to wind the mainspring inside a wall clock (Figure 48). Clock key tips came in different diameters to fit various clock models. Some clock keys have two ends. In these keys, the larger end was used to wind the mainspring, while the smaller end was used to wind a *regulator* (a device that speeded up or slowed down the clock). These two-ended keys are called *regulating and winding keys*. Clock keys are still made today to fit reproduction antique clocks.

FIGURE 48—Figure 48A shows a typical clock key and Figure 48B shows a regulating and winding key.



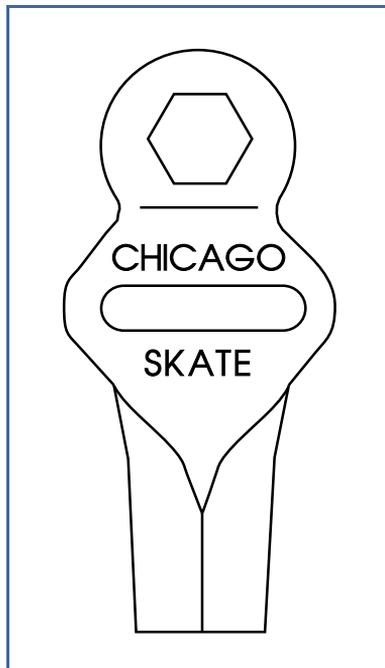
Toy Keys. Some old metal wind-up toys used keys that look very similar to clock keys (Figure 49).

FIGURE 49—Many wind-up toys use keys very similar to clock keys.



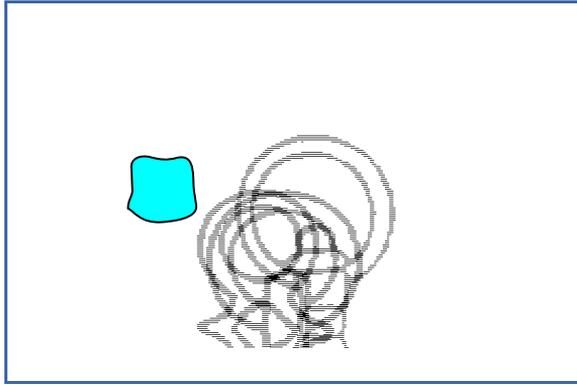
Skate Keys. Some of us are old enough to remember the old metal skates (both ice skates and roller skates) that clamped on and were tightened with a key (Figure 50). Because this type of skate is now obsolete, these keys are becoming popular collector's items!

FIGURE 50—This type of key was used to tighten roller skates.



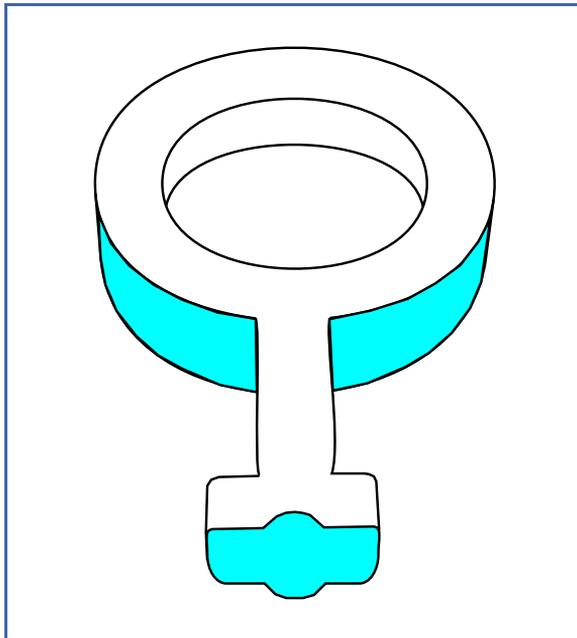
Watch Keys. Old-fashioned pocket watches were wound using a key (as opposed to later wristwatches that contain their own winding button). Most watch keys are very small, one inch in length or less (Figure 51). Pocket watches were made for both men and women, but either way, they were highly prized pieces of jewelry. For this reason, some watch keys were made in gold or silver, or were set with small jewels.

FIGURE 51—Watch keys are very small, often less than one inch in length.



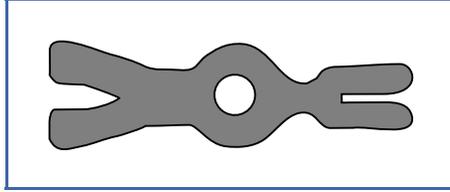
Water Keys. Water keys (Figure 52) were used to unlock water main covers and to release water valves. Water keys may more correctly be called wrenches than keys, since that's how they operate.

FIGURE 52—Shown here is a typical water key.



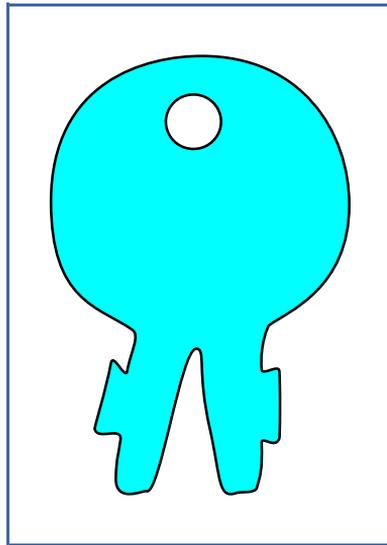
Electrical Switch Key. In some municipal buildings, if the power shuts off, a key is needed to access the main electrical panels to restore power. The type of key used to access an electrical switch is shown in Figure 53.

FIGURE 53—This type of key is used to access an electrical switch.



Lawnmower Key. Some power lawnmowers use the type of key shown in Figure 54.

FIGURE 54—This type of key is used in a power lawnmower.



If you should become interested in collecting keys, there are many good reference books available to help you learn about them. A good place to contact for more information about collectible keys and reference books is Key Collectors International, P.O. Box 9397, Phoenix, Arizona, 85806.



Locking It Up! 4

1. The _____ key was jointed in the middle so that it could be carried conveniently in a pocket.
2. _____ keys contain two different keys, one at each end of the shank.
3. A cloverleaf key is a type of _____ key with a bow in the shape of a three-leaf clover.
4. _____ keys are very short, and many fold in half so that the key could be left in the lock when the door was slid into the wall.
5. Large barrel keys that were used by railroad switchmen to unlock gates and divert boxcars from one track to another are called _____ keys.
6. The two-ended type of clock key that performs two functions is the _____ key.

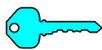
Check your answers with those on page 51.

THE KEY TO SUCCESS

Well, you've made it to the end of another study unit! Think back on all the valuable information you learned in this text. You learned about key blanks, key duplication, and key identification. Remember that the ability to quickly and correctly identify keys is one of the most important locksmithing skills. You've already mastered the basics in this area. You should be proud of your continued efforts to reach your career goals.

Now, when you're ready, read through the *Key Points to Remember* that follow. When you've reviewed the material and feel you know it well, proceed to the examination for this study unit. Good Luck!

KEY POINTS TO REMEMBER



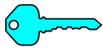
As a locksmith, one of your most common tasks will be key duplication. The key blank you use to make a duplicate must be *exactly the same* as the customer's original key in shape and size. For this reason, being able to identify a customer's key and properly match it to a key blank is an extremely important locksmithing capability.



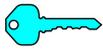
The main types of keys you should be familiar with are the bit key, barrel key, tubular key, flat key, cylinder key, and dimple key. Each of these key types is used with a specific type of lock. Bit and barrel keys are used with warded locks, tubular keys are used with vending machine and computer locks, flat keys are used with lever locks and warded padlocks, cylinder keys are used with disk tumbler or pin tumbler cylinders, and dimple keys are used with high-security lock cylinders.



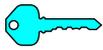
The main parts of a cylinder key blank are the *bow*, *shoulder*, *blade*, *tip*, *bitting*, and *milling*. The bow is the handle of the key. The shoulder is the projection between the bow and the blade that stops the key from penetrating too far into the lock. The blade is the longest portion of a key where the cuts are made. The tip is the end of the blade. The cuts or notches made in the blade are the bitting. The milling grooves are engraved into the blade.



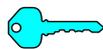
The manufacturers of locks and key blanks use a number of different methods to identify their products. Some lock manufacturers stamp their names on the key bows; others use both their names and an identifying number. However, the easiest way to identify the manufacturer of a key blank is by looking at the bow shape. Each manufacturer uses a distinctive shape to make its key blanks look different from all others.



Some lock manufacturers only make keys to fit their own locks. These keys are called *original keys*. Some companies make keys to fit locks made by a number of other manufacturers. These keys are called *look-alikes*. Look-alikes are exactly the same as original keys in the size and shape of the blade and grooves, and will usually have the same bow shape as the original keys as well.



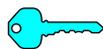
Some companies don't use the "look-alike" system; instead, they use their own bow shape no matter what locks the key blanks are made for. These keys are referred to as *generic key blanks*. You'll need to use the numbers to identify each key. Generic key blanks are usually inexpensive and are therefore popular with locksmiths.



The Cole or E-Z system is the most popular and recognized system for marking key blanks. The E-Z system uses one or two letters and one digit to identify key blanks. The letter or letters are the initials of the manufacturer. So, for example, *Y* stands for *Yale*, *SC* stands for *Schlage*, and *M* stands for *Master*. By looking at these letters, you can instantly determine whose locks the key will fit.



Many locksmith suppliers and ordinary hardware manufacturers produce *neuter key blanks*. Neuter blanks contain no manufacturers' information or identifying bow shape at all, only the name and/or phone number of the retail store where they were sold.



A manufacturer's catalog can be very useful for identifying key blanks. Key catalogs typically contain *silhouettes* (outlines) of the keys made by that manufacturer. The silhouettes are exactly the size and shape of the real-life keys they represent. Under or next to each silhouette you'll also find an *end view* of the key blank.



A *cross-reference directory* is a useful resource that lists the numbers of all the key blanks made by a given manufacturer; then,

the directory lists the corresponding numbers of key blanks made by several other manufacturers. For example, by looking up one Ilco key blank number, you can instantly find the corresponding Star, Dominion, Taylor, or Cole key blank numbers.



When a customer comes into your shop and asks for a duplicate key to be made, there are a number of techniques you can use to determine what blank to use. However, the first step in this process is always to determine whether it's legal for you to duplicate the key. Remember that if a key is stamped "DO NOT DUPLICATE," the customer must provide you with a *waiver of responsibility* form printed on the letterhead of the key's owner before you can make a copy of the key.



The next step is to identify the original manufacturer of the customer's lock. Start by looking at the customer's key for the manufacturer's name, or look at the shape of the bow.

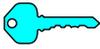


Then, consult that manufacturer's key catalog to find the blank you need. Check the identifying number on the blank; then, look up that number in the index at the beginning of the catalog. Find your number in the index and see what page that blank is pictured on. Then, go to that page and compare your real key to the silhouette. You can lay the key right on the page over the silhouette. It should match exactly!



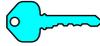
If you know the manufacturer, but the key contains no identifying number (or if the key is too worn to read) simply flip through the catalog pages and look for a picture that resembles your key. If a key contains no identifying marks at all, you'll have to compare the customer's key to blanks in your shop by hand. You'll need to compare *key characteristics* in order to make a match. For a cylinder key, these characteristics include the following:

- Blade length (The length of a the key's blade from the bow to the tip)
- Blade width (The distance across the blade from left to right)
- Key thickness
- Tip shape
- Groove length and shape



For a bit or barrel key, the identifying characteristics are these:

- Shank length
- Post length
- Tip length and diameter
- Bit length, height, and thickness



In addition to the standard, everyday keys that customers bring in to your shop, it's always possible that someone will ask you to identify an old-fashioned or obsolete key. While locksmiths aren't expected to be experts in antique keys, there are a few common types of old keys that you should be able to recognize. Being able to identify strange keys will mark you as a knowledgeable professional in the eyes of your customers! Some of these include the following:

- Gate keys (large iron keys used in old gates)
- Folding door keys (long door keys that fold in half in the middle)
- Double-ended keys (bit keys containing two different keys, one at each end of the shank)
- Cabinet keys (bit or barrel keys used to open cupboards, cabinets, chests of drawers, and desks)
- Cloverleaf keys (cabinet keys with cloverleaf-shaped bows)
- Chest keys (long, simple keys that resemble bit key blanks)
- Pocket door keys (short folding keys that remained in a pocket door when it was slid into the wall)
- Safe keys (used before combination locks were widely used)
- Railroad switch keys (large barrel keys used to unlock gates and divert boxcars from one track to another)
- Night watchman's keys (special keys attached to a watch station by chains)
- Sewing machine keys (small keys with a triangular or square end)

- Clock keys (keys used to wind the mainspring inside a wall clock)
- Skate keys (keys used to tighten metal roller skates)
- Watch keys (keys used to wind pocket watches)
- Water keys (keys used to unlock water main covers and release water valves)
- Electrical switch keys (keys used to access a building's electrical system)
- Lawnmower keys (keys used in the ignitions of power lawnmowers)

Do You Know Now. . .

Below are the answers to the questions asked at the beginning of this study unit.

What are the main parts of a cylinder key blank?

The main parts of a cylinder key blank are the *bow, shoulder, blade, tip, biting, and milling*.

What is the E-Z numbering system?

The Cole or E-Z numbering system is the most popular and recognized system for marking key blanks. The E-Z system uses one or two letters and one digit to identify key blanks. The letter or letters are the initials of the manufacturer. So, for example, *Y* stands for *Yale*, *SC* stands for *Schlage*, and *M* stands for *Master*. By looking at these letters, you can instantly determine whose locks the key will fit.

What is a *cross-reference key directory*?

A *cross-reference key directory* is a useful resource that lists the numbers of all the key blanks made by a given manufacturer; then, the directory lists the corresponding numbers of key blanks made by several other manufacturers. For example, by looking up one Ilco key blank number, you can instantly find the corresponding Star, Dominion, Taylor, or Cole key blank numbers.

NOTES

Locking It Up! Answers

1

1. h
2. b
3. g
4. e
5. f
6. c
7. d
8. a

2

1. Bow
2. Milling groove
3. Shoulder
4. Tip
5. Blade
6. Bitting
7. cylinder

3

1. False
2. True
3. False
4. False
5. False
6. True
7. True
8. False

4

1. folding
2. Double-ended
3. cabinet
4. Pocket door
5. switch
6. regulating and winding

NOTES

Appendix

ICS KEY BLANK CATALOG—INDEX

Note: The EZ number is developed by distributors to reduce the size of the part number. The EZ number is unique to each distributor.

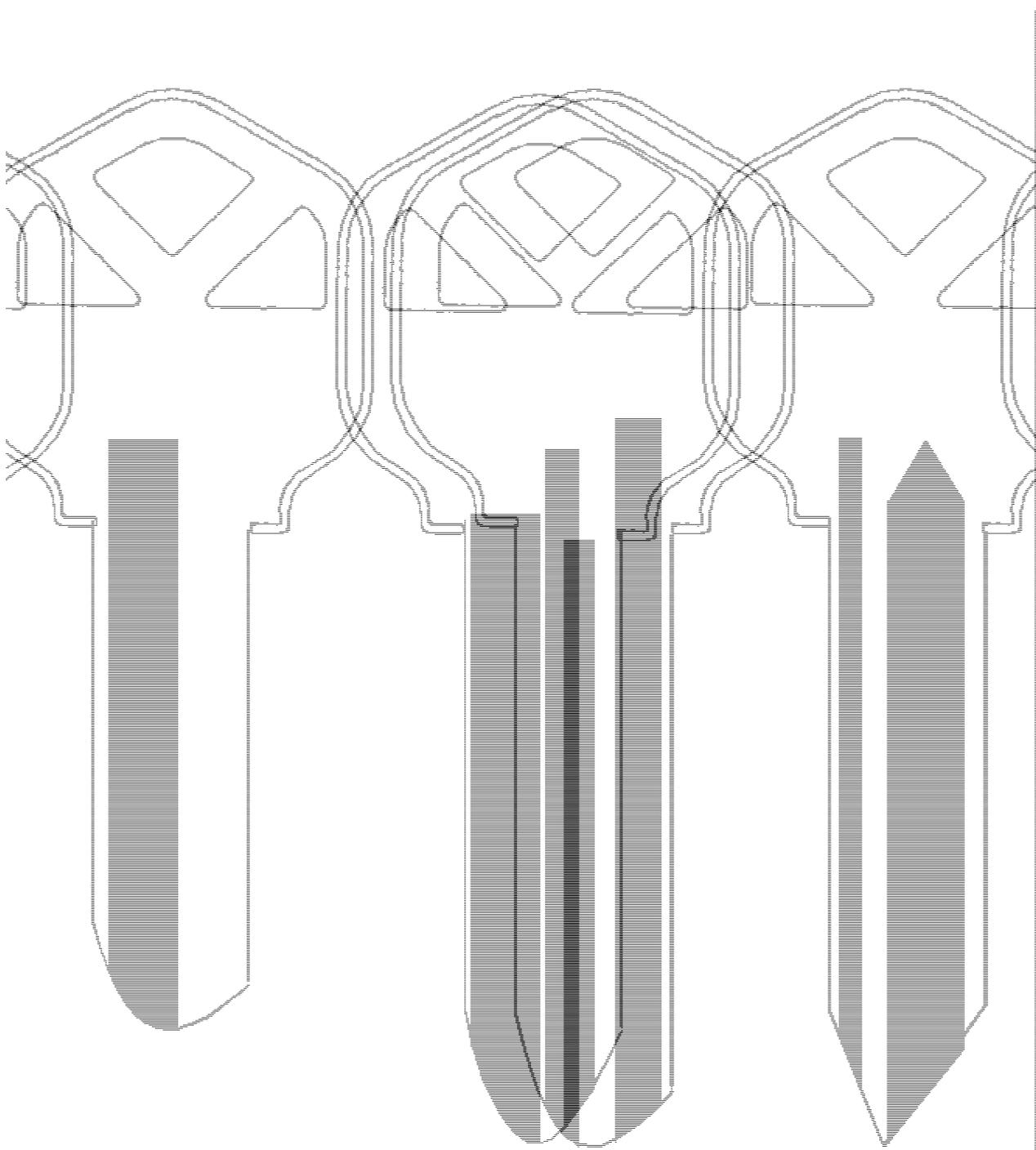
EZ NUMBER	PAGE	EZ NUMBER	PAGE	EZ NUMBER	PAGE
AA2	1	DE4	4	KA14	27
AM1	1	DE8	4	KM9	27
AP1	1	EA1	4	KW1	1
AP2	1	EA13	4	KWI-PC	1
AR1	1	EA27	4	KW5	1
AR4	1	EL1	4	KW9	1
B1	22	EL2	4	L1	7
B2	22	EL3	4	L4	7
B3	22	ER1	4	L13	7
B44	22	ES9	4	LF7	28
B45	22	F91C	20	LO1	7
B51	22	F91C2	20	LUV1	29
B52	22	FA1	5	M1	8
B53	22	FA2	5	M2	8
BE2	2	FA3	5	M3	8
BL6	25	FC2	26	M4	8
BN1	2	FC7	26	M10	8
BO1	2	FT37	20	M12	8
CG1	2	FT38	20	M13	8
CG2	2	H5	25	MB15	28
CL1	2	H6	25	MB41	29
CO1	2	HD70	25	MG1	29
CO3	2	HD70U	26	MZ10	29
CO5	2	HD71	26	MZ17	29
CO102	3	HO1	26	MZ19	29
CO106	3	HO4	26	N1	9
DA20	25	HY2	26	N3	9
DA23	30	HY2-P	26	NA1	9
DA24	30	HY3	26	NA6	10
DA25	30	HY4	26	NE48	30
DC1	3	IL1	6	NH1	10
DC3	3	IN1	6	OL1	10
DC3-P	3	IN29	6	P1	10
DE1	3	JA2	27	P2	10
DE2	3	K1	6	PA5	10
DE3	3	K2	6	PA6	10

ICS KEY BLANK CATALOG INDEX—CONTINUED

EZ NUMBER	PAGE	EZ NUMBER	PAGE	EZ NUMBER	PAGE
PA8	11	SC6	1	VO6	35
PG5	31	SC7	1	VO73	15
PO5	31	SC8	1	VR2	15
PO7	31	SC9	2	VR5	15
R3	11	SC10	2	VR7	15
RA1	11	SC22	13	VW77	35
RA2	11	SK1	13	W1	15
RA3	11	SL1	13	WE1	15
RE1	11	SL20	13	WK1	2
RO1	11	SUZ10	33	WK2	2
RO3	11	SUZ11	33	WR2	2
RU16	11	SUZ15	34	WR3	2
RU44	12	T1	14	WR4	2
RU45	12	T2	14	WR5	2
S1	12	T7	14	X95	32
S2	12	TR33	34	XL7	32
S1	12	TR37	34	Y1	16
S2	12	TR39	34	Y1-PC	16
S3	12	TR47	34	Y1E	16
S4	12	U61VW	34	Y2	16
S7BW-P	12	V27	34	Y3	16
S10	12	V32	34	Y4	17
S22	12	V35	14	Y5	17
S31	12	V37	15	Y101	17
SA1	12	VL6	35	Y152	37
SC1	12	VL8	35	YU2	37
SC4	1				

ICS KEY BLANK CATALOG

PAGE-1

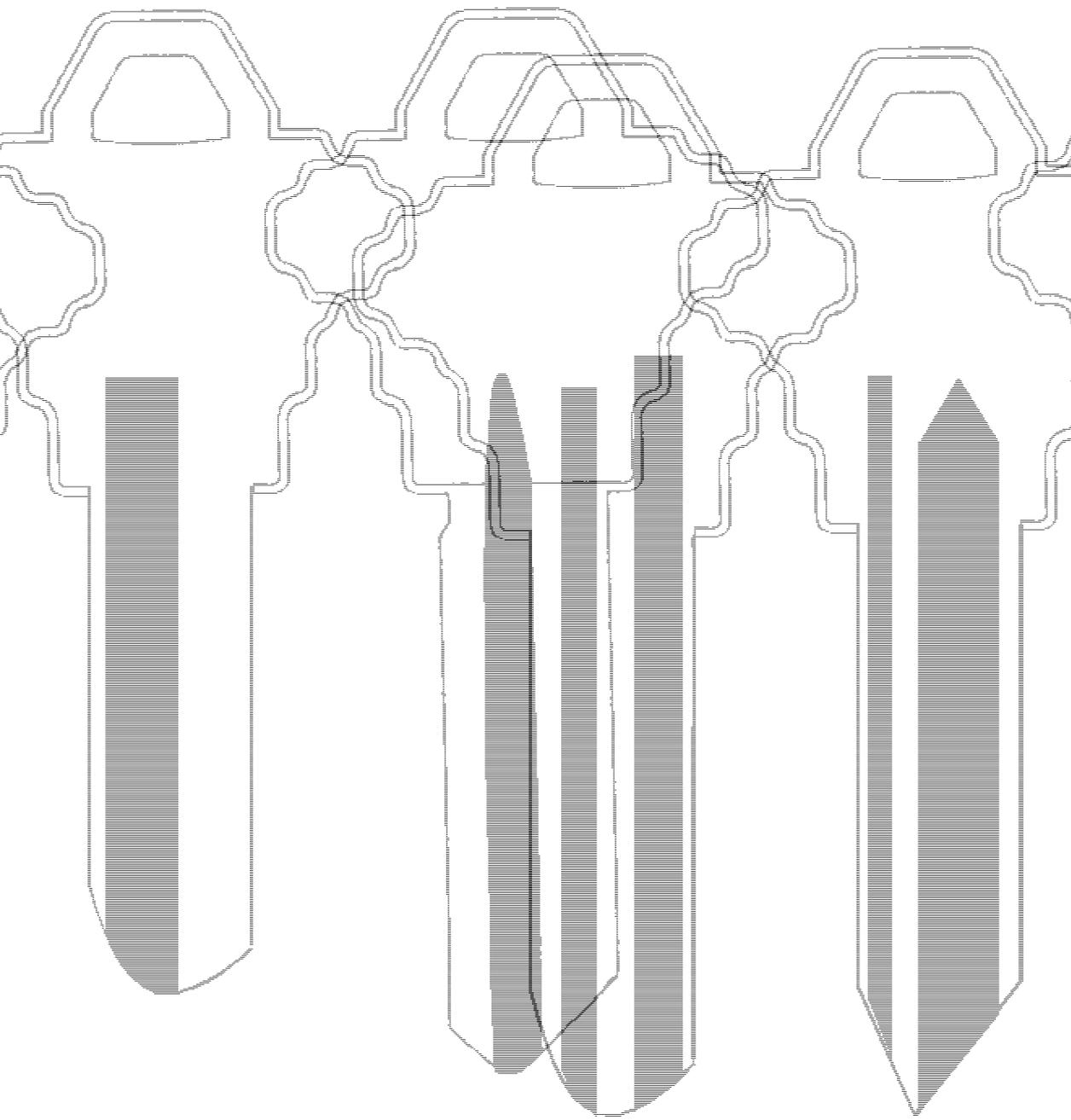


ICS11

ICS13

ICS12

ICS KEY BLANK CATALOG



ICSX6

ICSX5

ICSX8

ICSX7

ICS CROSS-REFERENCE DIRECTORY

Ilco	Cole	Dominion	ESP	EZ	Star	Taylor
1001EB	CO3	01EB	CO3	CO3	5CO2	21EB
1001EN	CO7	01EN	CO7	CO7	5CO1	21EN
1001GH	CO67	01GH	CO97	CO97	5CO13	K22
1003M	CO106	03M	CO106	CO106	5AU1	22R14
1004KL	54KL	04KL	L37	—	71L2	54KL
1010N	S43	10N	S68	S68	5SA7	51S
1011	RU1	11	RU1	RU1	5RU1	55
1011D1	RU20	11D1	RU45	RU45	5RU7	57-1D
1011GH	CO67	11GH	—	RU44	5C013	57R
1011P	RU4	11P	RU4	RU4	5RU2	
1011PZ	RU1A	11KM	RU18	—	5RU5	57M
1014	EA1	14	EA1	EA1	5EA2	61
1014C	HR1	HR2	HR1	HR1	5HR1	S61FR
101AM	AP1	41AC	—	AP1	—	F41A
1022	SE1	22	SE1	SE1	5SE1	102
102AM	AP2	41AD	—	AP2	—	FR1B
103AM	—	41AB	—	AP3	—	FR1C
1041C	AM1	41C	AM1	AM1	JU1	41C
1041E	CG16	41T	CG22	CG22	CG5	41RB
1041G	CG1	41G	CG1	CG1	CG1	41G
1041GA	CG2	41GA	CG2	CG2	CG6	41GA
1041GR	CG4	41GR	CG3	—	CG2	41GR
1041T	CG15	41E	CG16	CG16	5CG7	41R
1041Y	CG14	41Y	KP1	CG17	5CG4	41Y
1046	AN4	41X	AM3	AM3	5JU2	J41
1046A	—	A41X	AM7	—	6JU2	J41A
1049D	—	49D	—	—	—	49D
1049E	SF7	49E	—	—	—	49S
1054HT	IN24	—	—	—	—	54HT
1054K	1N3	54K	1N3	—	5IL2	54K
1054KD	DE1	54KD	—	DE1	5DE1	54KD
1054WB	WR2	H54WA	WR3	WR3	5WR2	54WB

ICS CROSS-REFERENCE DIRECTORY—CONTINUED

Ilco	Cole	Dominion	ESP	EZ	Star	Taylor
1069	RO1	69	RO1	RO1	RO1	62
1069N	RO9	H69	—	RO3	RO6	174J
1079B	K2	79B	K2	K2	5KE1	79HK
1092V	M3	92V	M4	M4	5MA3	U92A
1096L	EL3	96L	EL3	EL3	5EL1	96L
1127DP	H27	127DP	H27	H27	HFD4	127DP
1145	SC1	145	SC1	SC1	5SH1	145
1154A	SC4	A145	SC4	SC4	6SH1	145A
1167FD	H33	167FD	H51	H51	H5D10	P27
1175	WK1	175	—	WK1	5WK1	175
1175N	WK1	H175	WK2	WK2	5WK1	175W
1176	KW1	H176	KW1	KW1	5KW1	54KS
1177N	NH1	22EZ	NH1	NH1	5NA1	N102
1179A	AR4	HL22W	AR4	AR4	6AR2	135A
1307A	SC6	707A	SC6	SC6	SH2	307A
1307W	SC22	707W	SC22	SC22	SH6	307W
1702K	Y152	702K	—	—	—	—
61VW	FO153	H62VN	—	61VW	—	V68D
62FS	EN2	62DR	UN18	62FS	UN3	S71B
999	Y1	9	Y1	Y1	5YA1	14
999A	Y2	9A	Y2	Y2	6YA1	14A
999B	Y145	X9B	Y220	Y220	4YA1	X14S
A1001ABM	CO89	01GM	CO89	CO89	6C012	A22GM
A1001EH	—	U00Z	CO66	CO88	6C011	A22Z2
A1114	ABE2	A114A	BE2	BE2	6BE1	—
A1145E	SC9	A145E	SC9	SC9	6SH4	145E
A1145EF	—	A145EF	—	—	—	145EF
A1145F	SC10	A145F	SC10	SC10	6SH5	145F
AA2	AA2	NE21	AA2	AA2	WN1	X51
B53	B53	—	B53	B53	SP1	X143

ICS CROSS-REFERENCE DIRECTORY—CONTINUED

Ilco	Cole	Dominion	ESP	EZ	Star	Taylor
B55	B55	—	B55	B55	TO3	X145
BMW1	—	HF28	BM3	BMW1	—	B80NR
C1096CN	EL10	EG1	EL10	EL10	5EL4	96CN
C1096LN	EL11	E96LN	EL11	EL11	5EL3	96LN
C999	Y3	C9	Y3	Y3	5YA2	14YM
DA23	DA23	DT21	DA23	DA23	DA6	X115
FC2	H7	KL6	FC2	FC2	CP1	X20
FT37	FO437	SF5	FT37	FT37	FT3	F79-1
FT6R	F77	DM9	WS2	FT6R	—	F81E
H1098LA	B10	H9BLA	B10	B10	HBR2	H98LA
H044	JA77	HD44	HD69	HO44	HON23R	HN4
K1122D	BN1	BG6	BN1	BN1	BN1	L54P
L1010N	S44	A10N	S69	—	6SA7	51SA
MZ10	JA72	MZ10	MZ10	MZ10	MZ2	X27
MZ9	JA65	MZ9	MZ9	MZ9	MZ1	X26
N1007RMA	S31	U07RN	S31	S31	6SA6	048KMR
P1098A	B48	P98A	B48	B48	HBR12A	P91A
P1098J	B46	P98J	B46	B46	HBR10J	X98J
P1770U	Y152	770U	—	Y152	—	P19A
P1771CR	Y106	771CH	—	—	—	X16
P1786P	—	—	—	P1786P	—	—
P1789	—	—	Y154	Y154	HPL89	—
PA5	GE26	WT6	PA5	PA5	—	A81R
PA6	GE34	WT7	PA6	PA6	AD1	A81S

NOTES

In this study unit, there are two examinations. The first examination, number 03100300, is a 20-question multiple choice examination. This examination will test your grasp of the information presented in the study unit.

The second examination, number 03180100, is a Practical Examination based on your accumulated knowledge of key identification and your ability to demonstrate your skills with real key blanks. Follow all instructions carefully. Both exams must be submitted to the school for grading. Good luck!

NOTES

THOMSON
—★—™
EDUCATION DIRECT
925 Oak Street
Scranton, Pennsylvania 18515-0001

EXAMINATION

03100300

Identifying Keys

Whichever testing option you choose for your answers, you must use this

EXAMINATION NUMBER:

03100300

When you feel confident that you've mastered the material in this study unit, complete the following examination. Then, *submit only your answers to school headquarters* for grading, using one of the answer options described in your first shipment. Send your answers for this examination as soon as you complete it. *Do not wait until another examination is ready.*

Questions 1–20: Select the one best answer to each question.

1. The manufacturer of the key bow shown below is



- A. Weiser.
- B. Schlage.

- C. Kwikset.
- D. Yale.

2. What is the maximum number of shoulders a key can have?

- A. 3
- B. 2
- C. 1
- D. 0

3. Manufacturer's identifying numbers are most often found on a key's

- A. bow.
- B. tip.
- C. blade.
- D. shoulder.

4. The cuts or notches in a key blade are called the

- A. milling.
- B. pins.
- C. bitting.
- D. barrels.

5. What is a bit key's blade called?

- A. The barrel
- B. The shank
- C. The throat cut
- D. The bit

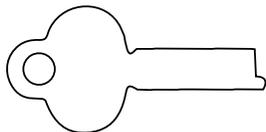
6. A flat key with cuts on only one side of the blade would be used with what type of lock?

- A. Disk tumbler lock
- B. Warded lock
- C. Pin tumbler lock
- D. Lever lock

7. A key with the identifying number RU64 was made by which of the following manufacturers?

- A. Schlage
- B. Cole
- C. Yale
- D. Russwin

8. What type of key is shown here?



- A. Flat key
- B. Cylinder key
- C. Barrel key
- D. Bit key

9. A lock containing a disk tumbler or a pin tumbler mechanism would use what type of key?

- A. Bit key
- B. Flat key
- C. Cylinder key
- D. Tubular key

10. Which of the following numbers is an EZ key blank number?

- A. 1029B
- B. 686C
- C. 14KR
- D. SC6

11. Most cylinder keys that have cuts on both sides of the blade are used with
- A. warded padlocks.
 - B. key-in-knob door locks.
 - C. automobile locks.
 - D. suitcases and briefcases.
12. The projection found between a key's bow and its blade is called the
- A. tip.
 - B. biting.
 - C. milling.
 - D. shoulder.
13. The ideal way to measure the thickness of a key blade is with a
- A. micrometer.
 - B. ruler.
 - C. tape measure.
 - D. key gage.
14. A bit key is used with what type of lock?
- A. Lever lock
 - B. Pin tumbler lock
 - C. Warded lock
 - D. Automobile lock
15. A bit key's *bit* is attached to the key's
- A. shoulder.
 - B. milling.
 - C. post.
 - D. bow.
16. A throat cut may be found on what type of key?
- A. Cylinder
 - B. Tubular
 - C. Bit
 - D. Flat
17. A dimple key is used with what type of lock?
- A. A high security pin tumbler lock
 - B. A warded lock
 - C. A lever lock
 - D. A vending machine lock
18. When trying to identify a key, what part should you start with?
- A. Shoulder
 - B. Tip
 - C. Bow
 - D. Post
19. What type of key is the most common in use today?
- A. Cylinder key
 - B. Bit key
 - C. Flat key
 - D. Tubular key

20. The letters WR identify the key-blank manufacturer

A. Weiser.

B. Welch.

C. Weslock.

D. West Evanston.

Instructions For: PRACTICAL EXAMINATION

03180100

Introduction

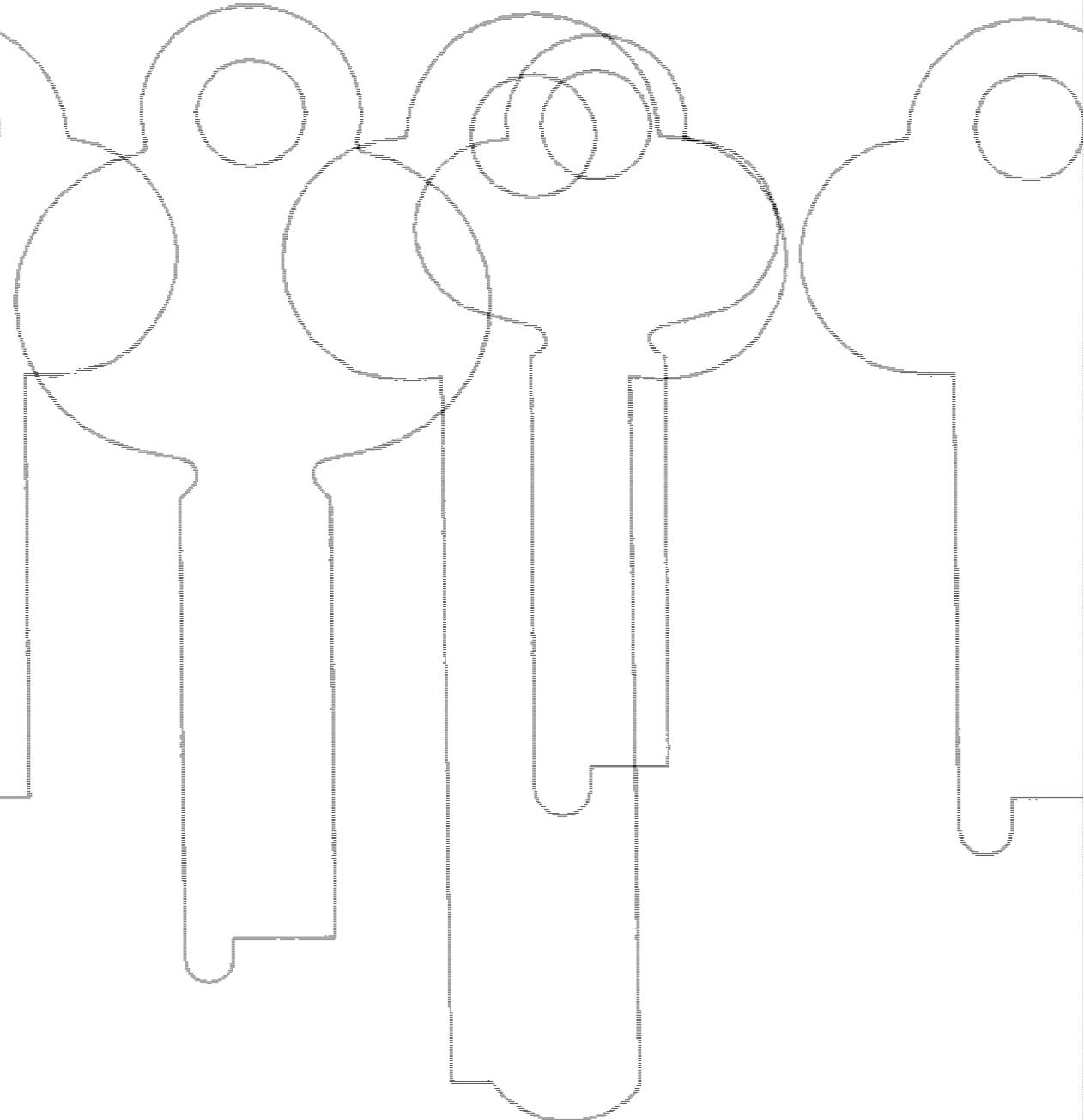
There are literally thousands of different keys being used today. One of the locksmith's most important skills is being able to identify and duplicate any key for a customer. In this study unit, we discussed some of the many professional techniques used in key identification. Now, we'll do some hands-on work with real keys. At the end of this exercise, you'll complete a Practical Examination based on what you learned.

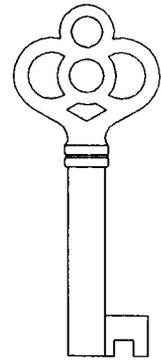
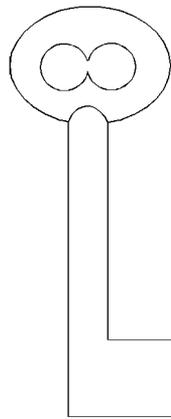
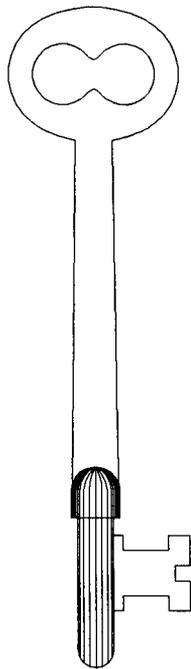
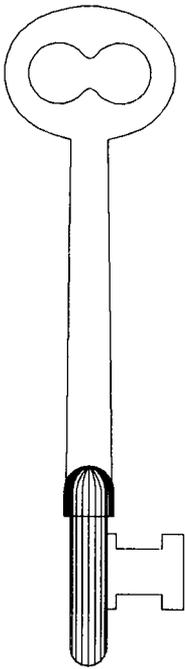
Locate the package of key blanks that was sent to you in this package of study materials. Open the package and lay the key blanks out neatly, face up, on a flat surface. (Be careful not to drop or lose any of the keys!) In counting the keys, you should have a total of 15 blanks altogether in front of you. While you may have your keys set out in a different order, your set should include all the keys pictured on the following pages.

Instructions

Now that you've laid out and examined your key blanks, you're ready to complete the five tasks that make up this hands-on practice exercise. In this exercise, you'll be doing all of the following:

1. Identifying Key Types
2. Identifying Bow Shapes
3. Identifying an Unknown Key





4. Using a Key Catalog
5. Using a Cross-Reference Directory

Part 1: Identifying Key Types

The first part of this exercise will require you to identify keys according to their type. Divide your keys into separate piles of bit keys, barrel keys, flat keys, and cylinder keys. Count the number of each type of key you have, and make a note of that information here:

BitKeys _____

FlatKeys _____

BarrelKeys _____

CylinderKeys _____

Part 2: Identifying Bow Shapes

Look at the cylinder keys you were sent. Remember that the most obvious way to identify the manufacturer of a particular key blank is by looking at the *bow or head shape*. Each manufacturer uses a distinctive shape to make its key blanks look different from all others.

All of the cylinder keys you were sent, with one exception, are “look-alike” cylinder key blanks. (The one exception is a “neuter-bow” cylinder key, which has no manufacturer’s information on it.) Look at the cylinder key blanks, and examine the shapes of their bows. See if you can determine the manufacturer of each lock the key is made for by the keys’ bow shape (you can refer back to Figure 16 on page 12 for assistance).

Part 3: Identifying an Unknown Key

Now, look at the neuter-bow key we just mentioned. You should easily be able to pick out this key because it’s the only cylinder key that has *no manufacturer’s information on it*. (Note that the shape of the neuter bow may vary.)

Now, notice that the blade and the milling cuts of this neuter key are an *exact match* for one of the other cylinder keys in your package. Which one? That’s for you to determine! Use the skills you learned in this study unit to help you compare the neuter key to the other cylinder keys. Compare the blade lengths, milling grooves, end views, and other features to help you find a match. You’ll be asked about the results of your comparison in the examination.

Part 4: Using a Key Catalog

Now, look at the Appendix in this study unit. This Appendix contains an example “key catalog” for you to use in completing this exercise. Note that the “catalog” has index pages, two pages of key blank silhouettes, and a cross-reference directory.

Try looking up one of your cylinder key blanks in the “catalog” now. Choose any one of the cylinder key blanks and examine it. Look at the identifying numbers on your key blank. On an Ilco blank, the number on the left-hand side of the blank is the Ilco number; the number on the right-hand side is the EZ number. On blanks of other manufacturers’ keys the EZ number may be on the left.

The first step in finding any key blank in a key catalog is to go to the catalog index. Find the EZ number on the key you’re examining. Then, find where that number is listed in the index. Next to each identifying number, you’ll find the number of the page where you can find that key blank in the catalog.

Go to the page number listed for your key. Look through the silhouettes illustrated on that page until you find an exact match for your key blank. Make a note of the manufacturer’s number printed under the matching silhouette. That’s all there is to it!

Part 5: Using a Cross-Reference Directory

Now, try looking up one of your cylinder key blanks in the *cross-reference directory* on pages 57–59 of the Appendix. (Remember that a cross-reference directory shows your key’s number, plus the corresponding numbers of other manufacturers.) Find the Ilco number on the key you’re examining. Look up the Ilco number in the column at the far left of the page. Then, look straight across the line to find the corresponding Cole, Dominion, Star, Taylor, and ESP numbers. Make a note of these numbers.

When you’ve completed all five of the tasks described here, you should have a much better “feel” for working with real key blanks. Proceed to completing the multiple choice questions that follow.

Whichever testing option you choose
for your answers, you must use this

EXAMINATION NUMBER:

03180100

When you feel confident that you have mastered the material in this practical exercise, complete the following examination. Then, *submit only your answers to school headquarters* for grading, using one of the answer options described in your first shipment. Use your package of key blanks, your knowledge of manufacturers' key bow shapes, the "key catalog" on pages 55 and 56, and the cross reference directory on pages 57–59 for assistance in answering these questions. Send your answers for this examination as soon as you complete it. *Do not wait until another examination is ready.*

Questions 1–15: Select the one best answer to each question.

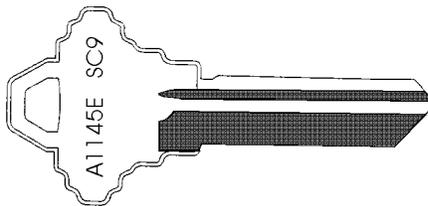
1. How many barrel keys were included in your package?

- | | |
|------|------|
| A. 2 | C. 5 |
| B. 3 | D. 1 |

2. How many flat keys were included in your package?

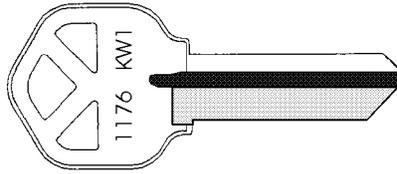
- | | |
|------|------|
| A. 4 | C. 1 |
| B. 2 | D. 5 |

3. Who is the manufacturer of the lock that this key is made to fit?



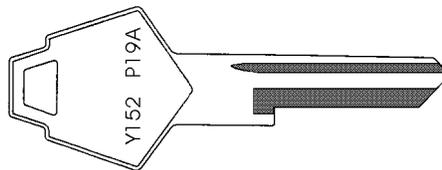
- | | |
|------------|------------|
| A. Kwikset | C. Weiser |
| B. Schlage | D. Weslock |

4. Who is the manufacturer of the lock that this key is made to fit?



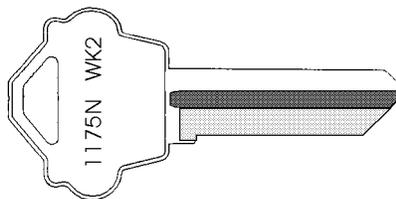
- A. Schlage
- B. Weslock
- C. Kwikset
- D. Dexter

5. Who is the manufacturer of the automobile key blank shown here?



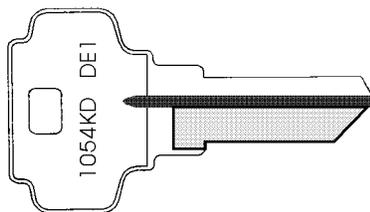
- A. Mazda
- B. Ford
- C. Honda
- D. Chrysler

6. What is the Iico number for the key shown here?



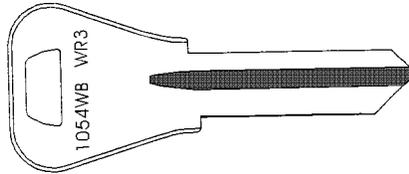
- A. 1175
- B. WK
- C. 1175N
- D. WK2

7. What is the EZ number for the key shown here?



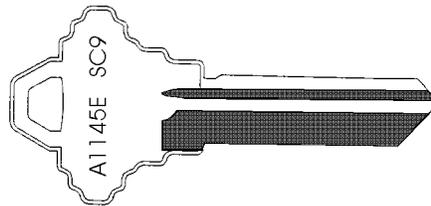
- A. DE1
- B. 1054KD
- C. DE
- D. 1054

8. Look at the key blank illustrated here. On what page of our “key catalog” does this key blank appear?



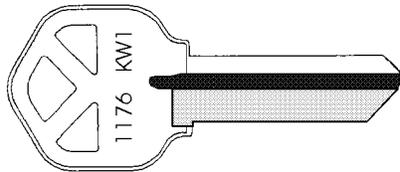
- A. 15
B. 2
C. 1
D. 22

9. For the key blank illustrated here, find the matching silhouette in the key catalog in the Appendix. What is the manufacturer's number that appears below the silhouette?



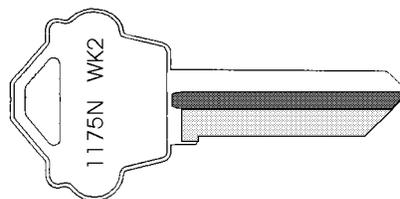
- A. ICSX8
B. ICSX5
C. ICSX2
D. ICSX3

10. For the key blank illustrated here, find the matching silhouette in the key catalog in the Appendix. What is the manufacturer's number that appears below the silhouette?



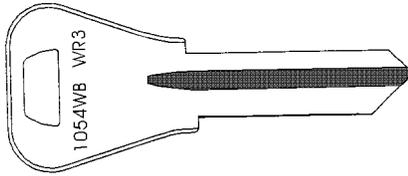
- A. ICS10
B. ICS14
C. ICS13
D. ICS17

11. For the key blank illustrated here, find the matching silhouette in the key catalog in the Appendix. What is the manufacturer's number that appears below the silhouette?



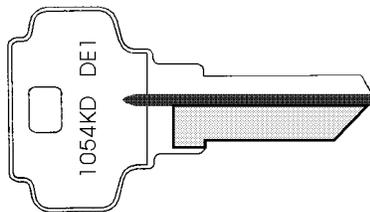
- A. ICS08
B. ICS06
C. ICS01
D. ICS03

12. What is the ESP number for the key shown here?



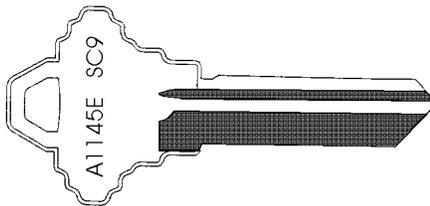
- A. WR3
- B. WR2
- C. 5WR2
- D. 54WB

13. What is the Dominion number for the key shown here?



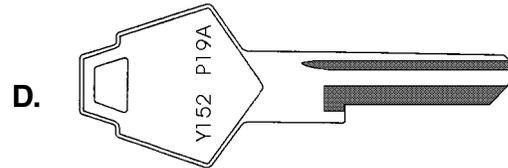
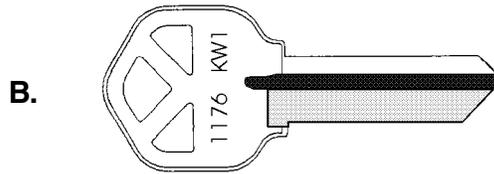
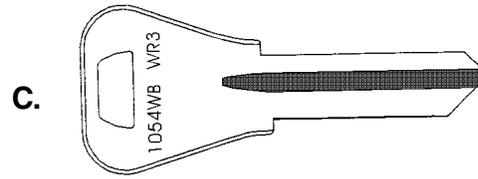
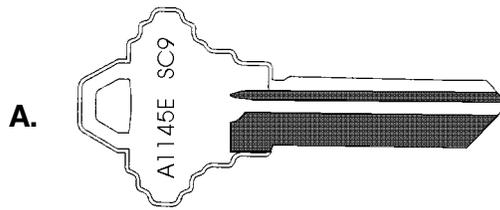
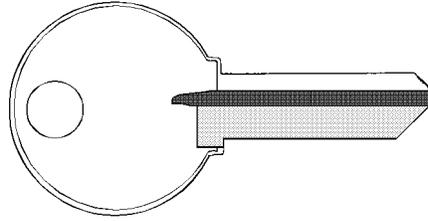
- A. DE1
- B. 5DE1
- C. 54KD
- D. H54WA

14. What is the Taylor number for the key shown here?



- A. BE2
- B. SC9
- C. 145EF
- D. 145E

15. Your neuter key blank (shown here) is a match for which of the other cylinder key blanks shown below?



COMING ATTRACTIONS

In your next study unit, we'll be examining lock mechanisms, the inner working parts of the locks we use every day. You'll learn about both key-operated locks and combination-type locks in detail. We'll discuss how these locks are constructed, how they work, and how to perform basic repairs on them. Good luck with your continuing studies!