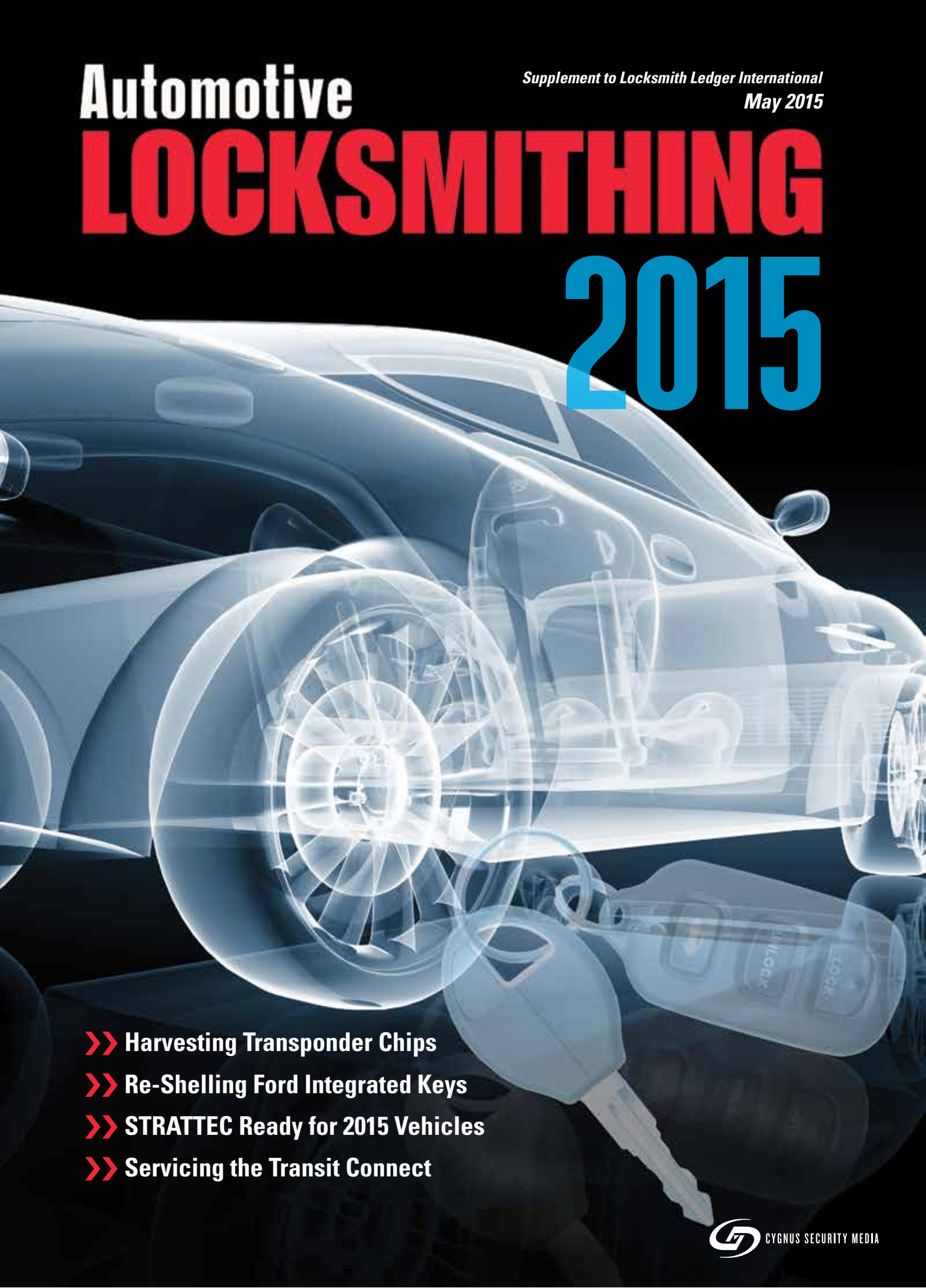
*Supplement to Locksmith Ledger International*
*May 2015*

# Automotive LOCKSMITHING 2015



- Harvesting Transponder Chips
- Re-Shelling Ford Integrated Keys
- STRATTEC Ready for 2015 Vehicles
- Servicing the Transit Connect

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Product door not shown in image
Fingerprint reader optional

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# HARVESTING Transponder Chips

Harvested Transponder Ampoules

**Harvesting a transponder takes only a few minutes. The complete procedure requires less than 10 minutes. There is no need to clone or program the transponder since it has been used to start the vehicle.**

*BY JERRY LEVINE*

The average aftermarket automotive or motorcycle plastic head transponder-equipped key blank costs from under $10 to more than $50. Mis-cutting an original equipment (O.E.M.) transponder key blank hurts, as it can cost more than $100.

Expanding automotive services means purchasing a larger stock of transponder key blanks for your service vehicles and shop. To lower costs and maintain sufficient stock, some automotive transponders can be recycled. Transponders can be harvested from worn, broken, unwanted, mis-cut or even new plastic head transponder-equipped keys. Transponders cannot be harvested from most circuit board-equipped vehicular keys as the transponder is integrated into the board. As far as I am aware, this is correct except for Honda.

Key wear and breakage are two good reasons for harvesting transponders. Here are a few examples. Pontiac vehicles using the PK3M transponder keys, such as the 2000-03 Grand Prix are subject to breaking because this key is used to operate the trunk lock. Early Nissan, Toyota and Ford vehicles seem to have sufficient key wear, which results in breakage as the keys will no longer turn in the locks. Honda transponder keys break because of premature lock failure.

Transponders can be harvested from these broken keys and installed into a chipless key blank. The hard part is getting the customer to pay for replacing the wafer tumblers or replacing the lock to eliminate the problem at least for a limited time if it is a Honda.

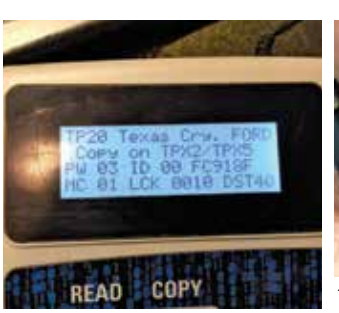
The Texas Instruments 40 bit transponder has been discontinued. The chips are sold out and key blank stocks are running low. The 80 bit transponder is backwards compatible to many – not all – 40 bit technology vehicles. However, a number of the Mazda (Ford) vehicles equipped with the 40 bit technology will not accept an 80 bit transponder if there are some programmed 40 bit transponders. This is one reason why the price of the 40 bit transponder-equipped Ford/Mazda key blanks is increasing.

*Generic Ford Transponder Key Equipped with a 40 or 80 Bit Transponder*

There is a work around. Use the eraser procedure in your programming device to remove all transponder

*Harvested Transponder Chips*


*JMA USA TRS5000 EVO Cloning Machine*




*Ford Texas Instruments Encrypted 40 Bit*

*Two Nissan Transponder-Equipped Key Blanks. NA is stamped onto blade on obverse side only*

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*Lincoln Logo Key with TI Fixed Transponder*

*Cutting Off Head portion Above Key Ring Opening*

*PVC Ratcheting Cutter*

*Key Head Cut Down To a Manageable Size*

*Slicing off the molded plastic face; cut in process*

*Transponder Covering Exposed*

*Removing Encapsulated Transponder from Blade*

values from the vehicle. Then, use your programming device to program two 80 bit transponders. The remaining 40 bit keys can be on-board programmed.

However, not all recycled transponders can be programmed to a different vehicle. This is the part that gets difficult. With transponder chips, nothing is always or never. A specific year, make and model recycled transponder chip may work most of the time or very rarely. This is why you never glue the sleeve/carrier into the head until the key has been tested a few times.

Let's begin with a few chips that most locksmiths do not recycle. They include the circle + (General Motors) and most Chrysler transponder chips. For all practical purposes, this chip is relatively inexpensive and not worth attempting to unlock. For more information on purchasing transponders, contact the companies at the end of this article.

The best way to determine if a transponder is programmable is to check it with a cloning machine that displays the pertinent information. Remember the cloning machine will read the key using the manufacturer's terminology.

For this article, I was given access to a JMA USA TRS5000 EVO. The TRS5000 EVO has four lines, 20 characters per line display. When a transponder is read, the display indicates some or all of the following: "TP" (transponder) number, the transponder description, which generation, vehicle manufacturer, JMA USA clonable transponder part number, identification and transponder-specific information.

For a Ford H92-PT aftermarket transponder key, the transponder is a TP33 Texas Crypto Copy on TPX2/TPX5 PW 03 ID MC 01 and in the bottom, right corner of the display, DST80. DST80 indicates an 80 bit transponder chip. A 40 bit transponder chip would indicate DST40.

For a Nissan NI04 aftermarket transponder key, the ceramic transponder chip is a TP12 Philips Crypto Copy on TPX4/TPX5 ID and PASSWORD MANCHESTER. PASSWORD MANCHESTER indicates the chip is lockable, but in the unlocked condition. If it were a programmed O.E.M. transponder chip, it would be locked and the display would indicate PASSWORD LOCKED MANCHESTER.

We will begin with the recycled transponders that can be programmed to other vehicles. They include Texas

*Encapsulated Head Removed*

*Breaking open Encapsulation to Expose Transponder Chip*

Instruments Fixed Code and Encrypted Code transponders and the transponders in the aftermarket 46 transponder chip-equipped keys, which includes 2004-on Nissan, Infiniti, Kia, Hyundai, Acura and Honda models.

Non-locked transponders can be recycled and used with a different compatible vehicle. For most applications, a locked transponder must be unlocked before it can be used to operate a different vehicle.

Unlocking is accomplished using specific machines including the Zed-Bull and the Intelligent Key Solutions

IKeyClone Transponder Programmer and Key Unlocker. These transponder programming devices are upgradable with available firmware.

Always check the transponder identification using a transponder cloner or similar tool that has an LCD, which displays the information. Not only will you find out if the transponder is locked or in the unlocked condition, but you will also find out additional information to determine if it is usable.

Many transponder-equipped plastic head keys have the manufacturer's part number, head shape, identifying characters or logo (jewel) that indicates the application. For example, see the Lincoln jewel key below the display in the photo on page S6. The key has the jewel beneath the offset key ring opening. The key blade has the groove indicating it is an 8-Cut blade. The JMA USA TRS 5000 EVO display indicates a Texas Fixed value transponder and the 32-character Texas Instruments Identification (ID).

This Ford, Lincoln, Mercury and Mazda head shape has been used with a number of key blades and transponders. The H72-PT key is an 8-cut blade with a Texas Instruments (TI) fixed value transponder. There is also an H73-PT key using the 10-Cut blade and the TI fixed value transponder. The H84-PT key uses the 8-Cut blade and the TI Encrypted value transponder that has a wide application. The H86-PT key is a special application key for specific years of the 2000-05 Ford Focus, 2001-04 Ford Escape and 2001-04 Mazda Tribute. The H84-PT can be used in place of the H86-PT, but the H86-PT cannot be used on other models. The final key using this

*Transponder Chip*

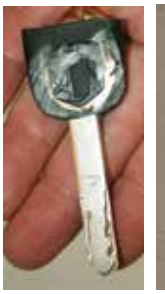
*Slicing Off GM Molded Plastic Face*

head shape is the 1997-98 Lincoln Mark VIII. Although the original key head shape was different, when Lincoln changed transponder providers, the head shape changed to the H72-PT. At this time, I am only aware of a STRATTEC key blank number, which is 691641. The head has STRATTEC incised. As an additional identifier for this key blank, the characters "M8" are stamped into the blade.

*Removing Transponder Ampoule*

*Removing transponder ampoule, closeup view*

*Honda Key Shortened*



*Exposing Transponder Chip*

*Key Blades with Room For Transponders*

There is an anomaly in the last paragraph. The Original Equipment Ford transponder key introduced around 1995 for the ten-cut lock mechanism (for example some Mustang models) has a groove that is very similar to the 8-Cut blade. An additional problem with this O. E. key blank is the blade is steel.

Once harvested, unlocked transponders can be installed into chipless (transponder less) automotive key blanks. Chipless automotive key blanks are available from Ilco, KeyLine USA, Jet Hardware and JMA USA.

These automotive and motorcycle key blanks have plastic heads and a rectangular slot in the bow that will accommodate a glass ampoule or chip transponder. Place the harvested transponder into a sleeve/carrier and slide into key bow. There is a hole at the bottom of the bow to remove the sleeve/carrier containing the transponder. Insert the end of a metal paper clip into the opening and push the transponder out.

There are a number of methods to harvest the transponder out of a plastic head transponder-equipped key. We will discuss using a PVC (plastic) ratcheting pipe cutter. Another very messy method is to use a wire wheel to brush off the molded plastic surrounding the transponder.

The PVC cutter can open its jaw to a limited degree. For this reason, I normally cut off the upper portion of the key head from about the middle of the key ring opening. After placing the cutter flat against the shank portion of the blade and roughly a bit less than the middle of the cut off head, I make a face cut. The cutter blade follows the metal blade, removing the molded plastic almost down to the transponder. Then depending upon the key construction, I remove the transponder, which is usually still at least partially encased within the remaining plastic head portion.

Carefully remove the transponder from the plastic, being especially careful if the transponder is a glass ampoule.

Determine the aftermarket chipless key blank. Originate the cuts. Insert the transponder into the sleeve/carrier. The sleeve/carrier fits into the key blank head in one direction only. Test the operation of the ignition lock.

An advantage of recycling transponders is the ability to repair broken transponder-equipped keys and to create a transponder key to meet the needs of a customer by combining a transponder and a chipless key blank. For more information, contact your local locksmith distributor or the following companies directly:

**Intelligent Key Solutions:** www.intelligentkeysolutions.com

**Kaba Ilco Corp.:** www.ilco.us

**KeyLine USA:** www.keyline-usa.com

**Jet Hardware:** www.jetkeys.com

**JMA USA:** www.jmausa.com ■

*Transponder Chip, Large Ampoule and Smaller Ampoule*

*Transponder Chip In Sleeve Adjacent to Chipless Key Blank*

*Removing Sleeve*

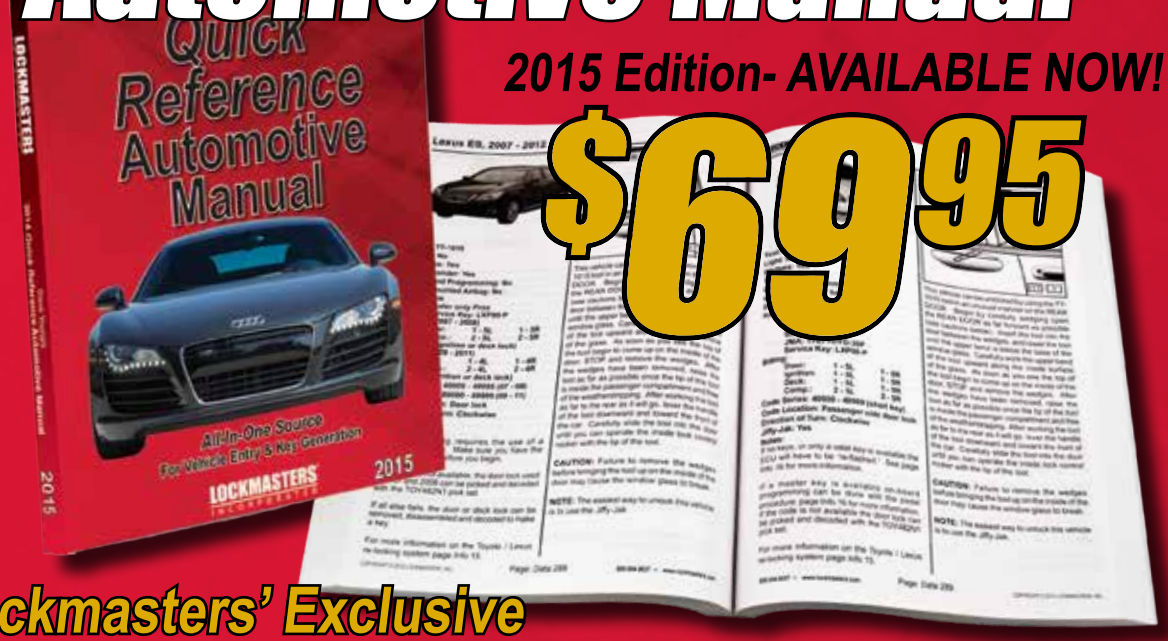
*Applying Adhesive to Sleeve*

*Finished Harvested Transponder-Equipped Key Blank*

## Steve Young's Annual

# Quick Reference Automotive Manual

60th Anniversary 1955 - 2015

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- If it is transponder equipped
- If it has door-mounted air bags
- Key blank information
- Door, Ignition and trunk bitting
- Code Series and Code Location (if any)
- Direction of turn to pick the door lock
- Key Generation procedure and recommended tools

A special "Data Section" includes information on relocking systems, reflashing, on-board programming procedures, VATS and many more systems that you need to understand if you want to be a successful automotive locksmith.

It includes all that is new for 2015 as well as some 2016 vehicles that will be introduced soon! Here are just some of the new vehicles covered:

- 2016 Acura ILX
- 2016 Buick Cascada
- 2015 Chevrolet Trax
- 2015 Chevrolet Colorado and GMC Canyon (all new)
- 2016 Honda HR-V
- 2015 Jeep Renegade
- 2016 Mazda CX3
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# RE-SHELLING Ford Integrated Keys

**While the cost of a replacement shell varies by manufacturer, it is much less expensive than the cost of a new integrated key plus dealer programming.**

*BY JERRY LEVINE*

*Ford 40 Bit 80 Bit and Sidewinder Integrated Keys*

Lexus introduced the first remote head key in the mid-1990s. Early Lexus remote head shells were held together using a Phillips head screw. Since that time, additional manufacturers have added remote head/integrated keys and the shell manufacturing process has evolved to produce sealed plastic head keys, designed to prevent disassembly.

Today's passenger vehicles are being financed and owned for a longer period. The average car loan has grown to 67 months, over five and one half years. In the first quarter of 2014, Experian Automotive reported that almost 25 percent of all new-car loans were 73 to 84 months long. And vehicles are being driven for more than 12 years, resulting in significant wear and tear on the key.

Gone are the days of a $2 duplicate automotive key. Duplicate plastic head transponder-equipped keys can be costly. This makes customers less likely to replace their remote head/integrated key just because the key does not smoothly rotate when starting the vehicle. This usually leads to the shell breaking off the blade. Once the vehicle owner's last key breaks, he or she is finally forced to contact a locksmith or go to the dealership.

Since the cost of replacement remote head/integrated keys have skyrocketed, many vehicle owners are opting to re-shell their keys instead of replacing them, saving the cost of programming that car dealerships usually require. The cost of a replacement

*Ford Integrated Key Blank Shell for 8-Cut*

*Grinding Off the Weld*

*Original Rubber Pushbutton Pad, Circuit Board and Logo Rear Cover*

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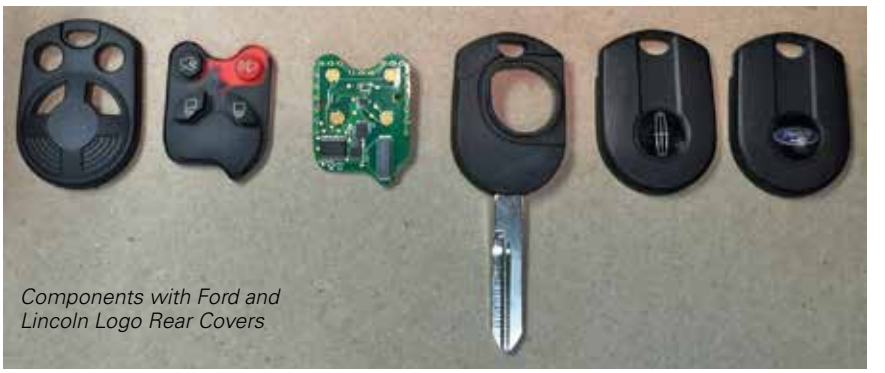
*Customer's Rubber Pushbutton Pad with Contact in place and Replacement Rubber Pushbutton Pad*



*Components with Ford and Lincoln Logo Rear Covers*

shell varies by manufacturer. Needless to say, it is much less expensive than the cost of a new integrated key plus the cost of programming.

To this end, shells have become available for many vehicle manufacturers' remote head/integrated keys. These include Chrysler, Dodge, Jeep, General Motors, Ford, Lincoln, Mercury and many "world" vehicles including Acura, Honda, Lexus, Mitsubishi and Toyota.

Vehicle manufacturers offer different shell configurations with differing numbers and sizes of buttons and differently sized shells. The Ford Integrated key shell varies by the blade; sidewinder or 8-Cut. Lexus remote head shells also vary by blade.

For this article, we will re-shell a Ford Integrated key. Replacement Ford integrated key blank shells come in four components: front cover, rubber pushbutton pad, interior housing with attached blade and rear cover without logo. I prefer to re-use the customer's pushbutton pad and logo rear cover if they are in good condition.

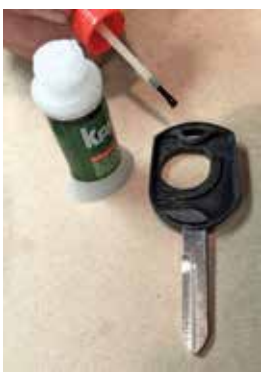
Use a battery operated hand grinder with 80 grit sanding band to remove the welded area from the existing shell. Once the welded area has been ground away, the two outer halves of the shell will separate. Disassemble the shell, separating the five pieces.

Discard the interior housing with blade and the front cover.

Carefully clean the rubber pushbutton pad, the circuit board and the logo rear cover. Use a mild spray cleaner

*Rubber Pushbutton Pad in Front Cover*

*Circuit Board Placed over Rubber Pushbutton Pad in Front Cover*



*Place Glue Around Outer Lip of Interior Housing*

*Use Two One-Inch Clamps to Secure Shell for Drying*

*When Dry, Remove Clamps & Insert Battery*

for the rubber pushbutton pad and the rear cover. Use a circuit board cleaner for the circuit board.

If the rubber pushbutton pad is worn, remove the contact, which is a clear insert on the underside of the customer's rubber pushbutton pad. There are two tabs on the rubber pushbutton pad. Locate the contact so the tabs slide through the openings to maintain position.

Place the rubber pushbutton pad into the front cover and the circuit board on top of the pad in their proper positions. Insert the battery through the opening in the interior housing with attached blade.

Use a cyanoacrylate adhesive, commonly known as Super Glue or Crazy Glue, to attach the front cover to the interior housing. Use the adhesive's brush-on applicator to go around the outer lip to ensure the glue is exactly where you want it.

Carefully place the front cover onto the interior housing.

Use two one-inch clamps to secure the two pieces together.

Dry time is about 20 minutes. Once dry, install a new battery and snap the original rear cover in place.

For more information, contact your local locksmith distributor or visit the following manufacturer websites:

- Jet Hardware: www.jetkeys.com
- JMA USA: www.jmausa.com
- Kaba Ilco Corp.: www.ilco.us
- KeyLine USA: www.keyline-usa.com
- Midwest Keyless Inc.: www.mwkeyless.org
- Transponder Island: www.transponderisland.com ■

*Front View, Re-Shelled Ford Integrated Key Blank*

*Rear View, Re-Shelled Ford Integrated Key Blank with Ford Logo*

# STRATTEC
# Ready for 2015 Vehicles

2015 Ford F150

**Changes are in store for 2015 models including Ford F150, Lincoln MKC, Mustang, Escape & Focus Huf locks, Fiesta, Hybrids, Transit and Transit Connect**

*STRATTEC 5926057: 2015 Ford F150 PEPS fob with panic buttons for domestic vehicles*

*STRATTEC 5926054: 2015 Ford F150 902 megahertz with panic button*

Ford is introducing 1- and 2-way transmitter fobs this year. The 1-way fobs do not have remote start while the 2- way fobs do have remote start. The LED on the remote control provides status feedback of the remote start or stop commands. A solid green means the remote start or extension was successful. A solid red means the stop was successful and the engine is off. A blinking red means the remote start or stop failed. A blinking green means the remote is waiting for a status update.

## FORD F150 TRUCKS

The 2015 F150 trucks use many different styles of keys/fobs. In general, the PEPS fobs that are 315 (5926057) and 902 (5926054) megahertz with panic buttons are for domestic vehicles, where the 433 (5926061) and 868 (5926053) megahertz with no panic buttons are for export. The emergency key for these PEPS fobs is 4223891.

The non-passive style F150 keys are flip keys (5923667, 5923694, 5923695, 5923696). There is also a rigid key (5923293) that is a 90-degree offset high security key. All of the transponders for the new F150 are 128 bit encryption.

The whole compliment of locks for the new truck includes a console (7026863), spare tire (7026861), ignition (7026751), left (7026856) and right (7026858) hand doors and tailgate (7026860). The tailgate lock also features a power locking mechanism (lock/unlock), as well as a remote release (opening) from the remote fob. The ignition utilizes a 10-cut external two track key and uses all 10 cuts on a left hand and right hand high security keyway. The door lock only utilizes 7 of the 10 cuts of the external two-track key (positions 4 through 10).

## LINCOLN 'EMBRACE' TECHNOLOGY

The new Lincoln MKC uses a 2-way transmitter fob (5925313, 5925315) with "embrace" technology. The "embrace" technology turns on exterior lighting to give you a warm return when it senses your approach from up to 8 feet away. The door handle pockets glow in soft lighting tuned to complement the vehicle's color. A Lincoln logo welcome mat illuminates the ground in front of the door while ambient lighting warms the interior in a soft glow. This all works as the PEPS key wakes up the vehicle as you approach. The emergency key fits inside the case of the PEPS fob. The emergency key for these fobs is 4223891.

## EDGE & FLEX

The Edge and Flex still have mechanical locks as standard and they both use integrated keys (5912512, 5912560). Some models do come with a PEPS option.

## ESCAPE & FOCUS HUF LOCKS

The Escape and Focus utilize the side mill or high security technology and have an integrated key (5921707, 5921709). They share common components. STRATTEC does not manufacture these components but

distributes them to the aftermarket under licensing from Ford. These common components are sourced from HUF.

A changeover is coming and the new integrated keys will be manufactured by STRATTEC and have the new unipad design. The 3-button part number will be part number 5926442 and the 4-button number will be 5922964. Both styles of keys can be used interchangeably, but for service and the aftermarket, the unipad design will eventually replace the Huf factory design for service and at dealers. Just to note, these are all 80 bit keys.

## MUSTANG GOES PASSIVE

The 2015 Mustang is completely passive. There is no mechanical ignition and the fobs (5926063, 5926056) feature a specialized galloping pony jewel. The emergency key for these fobs is 4223891.

## HYBRID VEHICLE CHANGES

There are some major differences in the Hybrid Ford vehicles when it comes to the type of ECU on board. They have a European system and therefore, different electronics. The European architecture fob (5923790) looks identical to the surfboard style fobs that many other Ford vehicles use, but they are not cross compatible. It is important that you stick with the proper part numbers so you don't run into programming issues. The 5923790 is not interchangeable with the 5921285, 5921286 or 5921288. The emergency key for these fobs is 5923267.

*STRATTEC 5926063: 2015 Ford Mustang; no mechanical ignition key for these vehicles*

*2015 Ford Fiesta*

*STRATTEC 5922964: 2015 Ford Fiesta side mill integrated keys with new panic button*

## FIESTA INFORMATION

The Fiesta has not changed keys since it was introduced in 2010. It still utilizes a European version of a PEPS fob (5919918) which does not have a panic button. The emergency key for this fob is 4212475.

In 2015, there will be a change necessitated by the need for a panic button in the United States. The transmitter (5913139) and horseshoe (5912976) two-piece design will be replaced by side mill integrated keys (5922964 and 5926442).

There is one more non-button key change for 2015. A new side mill 80 bit high security oval head designed key (5924628) is also manufactured by STRATTEC. It can be used on any vehicle that has 80 bit high security side mill technology.

## TRANSIT & TRANSIT CONNECT

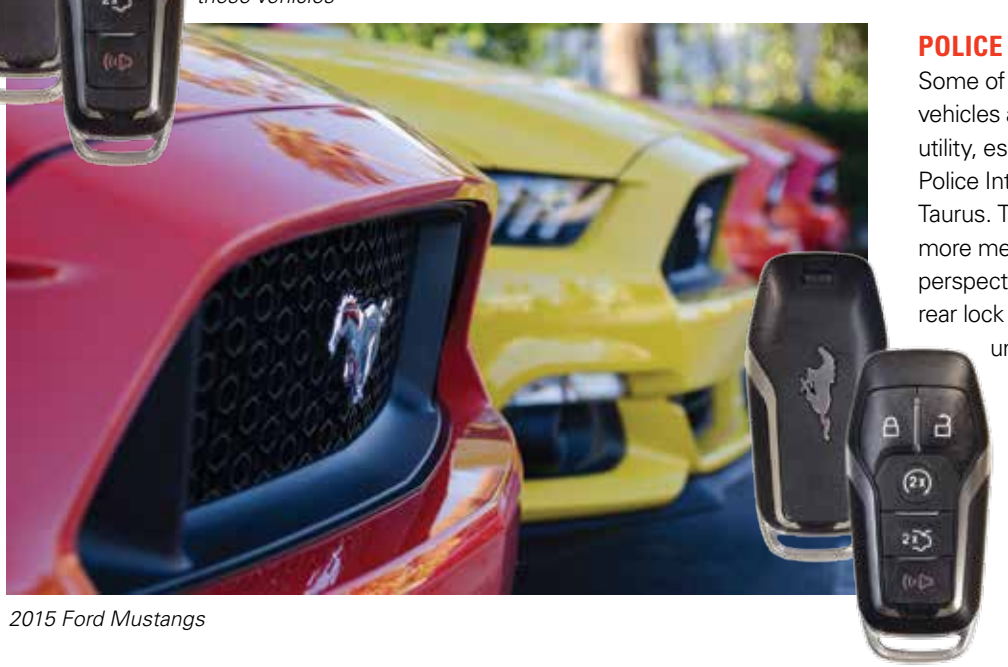
The 2015 full size Transit Van, which will ultimately replace the Econoline, utilizes a high security, side mill key (5925981). The key is very specific to the Transit Van because it has a cargo button which is unique to this vehicle.

The 2015 Transit Connect Van is no longer using a Tibbe key. For 2015, it uses the high security, side mill keys (5926442, 5922964). No ignition or door parts are available for the aftermarket.

## POLICE VEHICLES

Some of the most widely used police vehicles are the Police Interceptor utility, essentially the Explorer, and the Police Interceptor sedan, essentially the Taurus. These interceptor vehicles use more mechanical locks from a utilitarian perspective. They all have a mechanical rear lock and a left and right door lock, unlike the consumer versions.

For more information contact your local locksmith distributor or: STRATTEC Security Corp., website aftermarket.strattec.com. ■



*2015 Ford Mustangs*



*STRATTEC 5926056: 2015 Ford Mustang fob featuring a specialized galloping pony jewel*

# SERVICING the Transit Connect

Photo 1. 2010 Ford Transit Connect

**2009-2013 Transit Connect vehicles use the Tibbe lock system. For the 2014 model year, the redesigned Transit Connect shifted to the Ford Focus 2-track lock system**

*BY STEVE YOUNG*

When Ford introduced the Ford Transit Connect (Photo 1) to North America late in the 2009 model year, the vehicle had already been on sale in Europe and other world markets since the 2003 model year. Since then, it has become a popular fleet and commercial vehicle. In North America, it is offered in two formats: as a passenger van with seating for five and as a cargo van with seating for two.

The Transit Connect is based on the Ford Focus platform and features a car-like ride, front wheel drive and impressive fuel economy. It is offered in two basic styles, the XL and the XLT, with the XLT being the higher-end vehicle which is usually equipped with power windows and power locks. The XL is normally equipped with manual windows and locks. There is also an "XLT Premium" version that is only offered on the passenger vehicles that includes leather seating, premium stereo system, and paint and trim upgrades. Both the XL and XLT versions have become very popular as fleet and commercial vehicles.

Photo 2. 2014 Ford Transit Connect

All Transit Connect vehicles sold in North America from 2009 – 2013 were equipped with the Ford Tibbe lock system. For the 2014 model year, the redesigned Transit Connect (Photo 2) went to the Ford Focus 2-track lock system. Photo 3 shows a comparison of the Tibbe key versus the 2-track key. For this article I'll be discussing the 2009 – 2013 Tibbe-equipped vehicles.

The Transit connect is a very difficult vehicle to generate a key for from scratch. And unless you have the specialized equipment, you really should refer these vehicles either to the dealer or another locksmith who has the proper equipment. If however, there is no one equipped to work on the Tibbe locks, you might want to think about getting set up to do them. In my area, hundreds of these vehicles are in use as commercial vehicles. Once I got the word out that I could service these vehicles, I started getting customers who drove 50 – 75 miles for me to make duplicate keys for them. Weigh your options and decide if this type of work is for you.

## UNLOCKING THE TRANSIT CONNECT

Like all new vehicles, the Transit Connect features multi-layer weather-stripping at the base of the windows. I recommend using a plastic shim to protect the lower layers of the weatherstripping as you insert the wedges (Photo 4). If you do not shim the weatherstripping, the lower layer will roll under your wedge and make the fit of the window much tighter, and the weatherstripping may get torn by the wedge. I also use two wedges placed about 10 inches apart at the front of the main window.

In the photos, I'm using the Tech-Train 1026 tool (Photo 5) from Lockmasters, Inc., but a variety of under-window tools will work as well. I like this tool for this job because the door panel is wider than usual and this tool will reach the handle assembly without dragging across the top of the door panel. The width of the tool also allows me to use leverage to very quickly and easily push the door handle out rather than attempting to pull it.

I use the shim to protect the

Photo 3. Tibbe Key vs new 2-track key

*Photo 4. Plastic shim protects weatherstripping as wedges are inserted*

*Photo 6. Shim used again to protect weatherstripping as tool is inserted.*

*Photo 7. Remove wedges before pulling tool up inside the vehicle*

*Photo 5. Tech-Train 1026 tool*

weatherstripping once again when I insert the tool into the door (Photo 6). Once the top of the tool is below the base of the window glass, I'll work the top portion up along the inner surface of the glass. As soon as I see the inside weatherstripping bulge upward as the tool comes up, I'll stop and remove the wedges before pulling it up any further. If you don't remove the wedges, you are making the job harder and risk breaking the window glass. The Transit Connect has a relatively roomy fit around the window glass, which makes inserting and removing the tool very easy (Photo 7).

Once the tool is inside the vehicle, I'll position the tip of the tool inside the handle trim so that the tip is behind the forward end of the inside handle (Photo 8). Photo 9 you shows that the tip of the tool is behind the forward end of the handle, but the shaft of the tool is at the rear of the handle. Because of the shape of the TT-1026 tool, I now just push the shaft of the tool forward to unlock the door. Leverage will push the handle out easily as I move the tool. This is much easier than actually trying to pull the handle.

If the vehicle has power door locks, it is also equipped with a central locking system. Unless the battery is dead or disconnected, moving the handle out will not only unlock the door, but also both front doors and both sliding doors. This is important because many of these vehicles are equipped with barricades between the front seats and the cargo area. If the keys are locked in the rear portion of the van, this will give you access to the rear. If the vehicle does not have power door locks, only the door that you are working on will be unlocked.

Photo 8. Tool placement

Photo 9. Pushing shaft of tool forward will push handle out & unlock door.

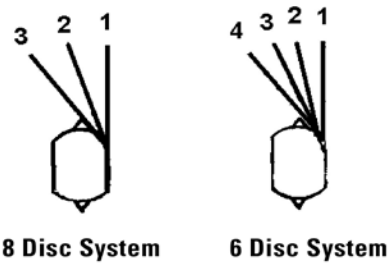



Photo 10. Angled cuts in 6-disc system vs. cuts in 8-disc system.

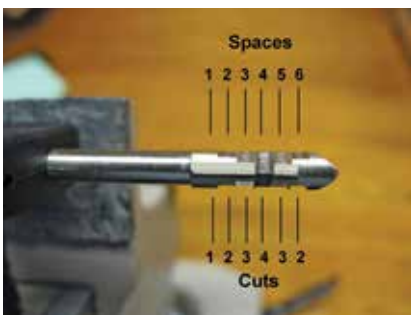



Photo 11. Six-wafer Tibbe key cut to: 1 2 3 4 3 2

Photo 12. Full set of discs & spacers from 6-disc Tibbe lock.

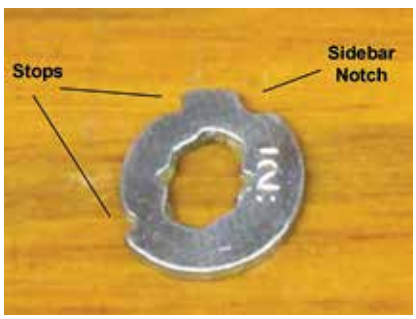



Photo 13. Close-up view, single Transit Connect disc.

## TIBBE LOCK SYSTEM

The Tibbe lock system was introduced around 1985, and soon became the standard Ford lock system in Europe. It has also been used on Jaguar and Merkur vehicles as well as others not sold in North America. The operating principle is somewhat similar to the Abloy system, in that it uses rotating discs instead of pin or wafer tumblers. The rotating discs work in conjunction with a sidebar to provide excellent security. Positions of the individual discs are determined by angled cuts made on the key blade. This type of system tends to be very rugged and pick resistant, although several picks have come on the market specifically for the Tibbe system.

Before the introduction of the Ford Transit Connect, the Tibbe system was almost extinct in North America. At one time, dedicated Tibbe key machines were available from most key machine manufacturers, but now those machines are hard to find. Instead, there are several Tibbe adapters available for common machines such as the Framon #2, Framon SD1 & SD2, the HPC 1200 and the Ilco Universal II. All of these adapters will allow a locksmith to originate a Tibbe key or to duplicate one after decoding it.

There are two basic Tibbe Systems: the 6-disc system and the 8-disc system. The 8-disc system is normally found only on older Jaguars in the U.S. The 8-disc system uses a key that is longer than the 6-disc system. In addition to the difference in length, the two systems also use different cuts on the key. Photo 10 shows a comparison of the cuts in the two systems. As you can see, the 8-disc system uses only three angles while the 6-disc system uses four angles. Since you need to decode the key before making a duplicate, it is important to know which system you are working with.

All Ford Transit Connect vehicles use the 6-disc system so there are four angles used on all of those. The number one angle is essentially a "no cut" in that the surface of the key as it comes out of the box would be all number one cuts just as on many traditional systems. The number four cut runs from the outer edge of the key all the way down to the small fin that runs the length of the key blade. The number two and three cuts are evenly spaced between the number one cut and the number four cut. Photo 11 shows a six-wafer Tibbe key cut to the following cuts: 1 2 3 4 3 2. With just a little practice, you should be able to visually decode a properly cut Tibbe key in just a few seconds.

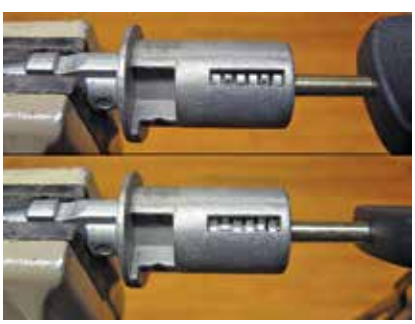


Photo 14. View through the sidebar slot showing configuration of discs locked & unlocked.

Photo 15. Tibbe lock chamber & sidebar pin.

*Photo 16. Lock with incorrect key inserted & sidebar in raised position*

*Photo 17. Lock with correct key inserted & turned, allowing sidebar to drop into unlocked position.*

*Photo 18. Usually the easiest door lock to remove is on rear door.*

Just as in a mechanical combination lock, the Tibbe locks use a fixed spacer placed between each rotating disc to prevent unwanted movement from being transferred from one disc to the next. Photo 12 shows a full set of tumblers and spacers from one 6-disc Tibbe lock placed alongside the lock chamber from which they came out. The spacers are in the upper row and the discs are in the lower row. Each disc has a sidebar notch that aligns with the sidebar when the proper key is inserted as well as one larger notch with a stop on each end that limits the movement of the disc inside the chamber. Photo 13 is a close-up of a single disc, where you can see the sidebar notch, the stops and the number of the cut that is associated with that disc. In the Ford Transit Connect, all of the discs are numbered with the exception of some "Dummy Discs" that are labeled with a "D".

When the correct key is inserted and turned, each disc rotates to a position that places them under the sidebar. When all of the sidebar notches are properly aligned, the sidebar can drop into the notches. Photo 14 is two shots of the same lock with the sidebar removed. In the top image, the individual discs are not aligned and in the lower image the discs are properly aligned so that the sidebar can drop into place. In the Tibbe locks the sidebar is actually a steel pin that floats freely in a slot in the side of the lock chamber. Photo 15 shows the lock chamber with the sidebar pin next to it. Note that the sidebar chamber is filled with grease. Tibbe locks are designed to be lubricated with grease and the grease will help hold the sidebar in place as you reassemble the lock. Photo 16 shows the sidebar in place in the locked position; in this position the lock will not turn. Photo 17 shows the sidebar in the unlocked position which will allow the lock to turn.

## DOOR LOCK REMOVAL

All of the door locks, including any locks

*Photo 19. Fiberboard trim panel secured with 11 upholstery clips.*

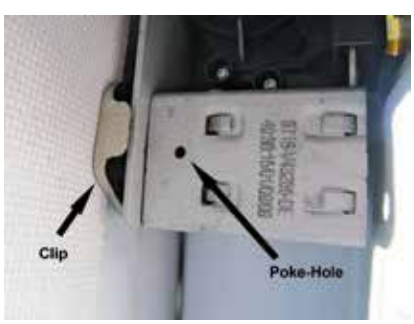



*Photo 20. Lock is held into armored box with 2 retainers.*

*Photo 21. Anti-rattle clip removed with pliers.*

*Photo 22. Use an ice pick or similar tool to access the active retainer through the poke-hole*

*Photo 23. If equipped with power door lock , fuse is behind panel on left side of dash.*


*Photo 24. Power door lock fuse is #163.*

*Photo 25. Once the active retainer has been depressed, rotate lock counter-clockwise & pull free of door.*


*Photo 26. Lock secured into door by 2 lugs that engage in slots in lock housing.*

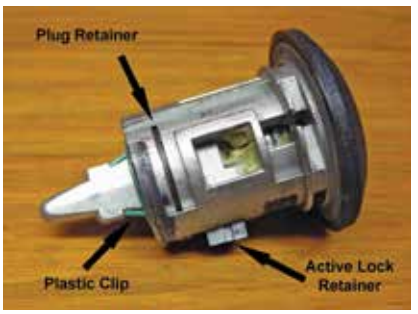



*Photo 27. Lock removed, showing one of the slots that engage with lugs as well as part of plug retainer and plastic anti-rattle clip.*

*Photo 28. Use 2 small screwdrivers to gently lift tabs on plastic clip & slide clip off.*

*Photo 29. Return spring wound around plastic clip will come free of lock.*

*Photo 30. 2 ends of horseshoe plug retainer.*

*Photo 31. Horseshoe retainer as seen from rear of lock.*

*Photo 32. Horseshoe retainer removed from the lock.*

*Photo 33. Lock cylinder components.*

on the sliding doors (if equipped) are removed in the same basic way once the inner door panel has been removed. In this case, we are removing the lock from a rear door, which has the easiest access in most cases. On most cargo vans, a fiberboard panel, (Photo 18) secured by 11 plastic push-in upholstery clips, (Photo 19) must be removed in order to access the lock. The lock is secured into an armored box inside the door with two retainers (Photo 20). One is a large horseshoe clip that appears to be designed to prevent the lock from rattling, and the second is a very substantial active retainer built into the side of the lock housing. The horseshoe clip can be easily removed with a pair of pliers (Photo 21). The active retainer can be depressed with an ice-pick or similar tool through the poke-hole (Photo 22).

If the vehicle is equipped with power door locks, it is necessary to remove the power door lock fuse before attempting to remove the lock. The fuse box is located on the left hand side of the dash behind a snap-on cover (Photo 23). This cover also conceals the OBD-II port that you will need to access if the vehicle is transponder equipped. The power door lock fuse is #163, which is a 20 amp fuse located in the lower row of fuses, fourth from the right (Photo 24). If you do not remove the power door lock fuse, the central locking system will attempt to lock the door as you turn the key to depress the active retainer, which will make it very difficult to remove the lock.

When the key is turned into the unlock position, the active retainer can be depressed. With the retainer depressed, rotate the entire lock counter-clockwise and pull it out of the door (Photo 25). Two lugs inside the lock mount engage in the two slots in the outside of the lock housing (Photo 26).

## LOCK DISASSEMBLY

Photo 27 shows the lock after it has been removed from the door and the active retainer that we depressed in

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*Photo 34. Lock plug & disc stack.*

*Photo 35. Discs placed in chamber with numbered sides up & a spacer between each disc.*

*Photo 36. Lug on inside of chamber must fit between the two stops on the disc.*

order to remove the lock. Unlike most automotive door locks, this lock is disassembled from the rear. The black cap on the front does not need to be removed unless you need access to the shutter assembly. The lock chamber is held into the lock housing with a horseshoe retainer (only one side visible in this photo) and a plastic anti-rattle clip at the rear of the cylinder.

Use two small screwdrivers to gently lift the tabs on the anti-rattle clip and then slide it off of the tailpiece of the lock (Photo 28). The lock return spring is wound around the anti-rattle clip and will usually pop off as you remove the clip (Photo 29). Photo 30 shows the two ends of the horseshoe retainer where they extend through the side of the lock housing. Pressing in on both ends of the retainer will release it so that it can come out of the opposite side of the lock housing. Photo 31 shows the horseshoe retainer from the end of the lock cylinder. Not shown in the photo is a small clear plastic bushing between the retainer and the back of the plug. Take care as you remove the retainer and the plug that you do not lose or damage this plastic bushing. The lock plug can now be pulled out of the housing from the rear. Photo 33 shows all of the major

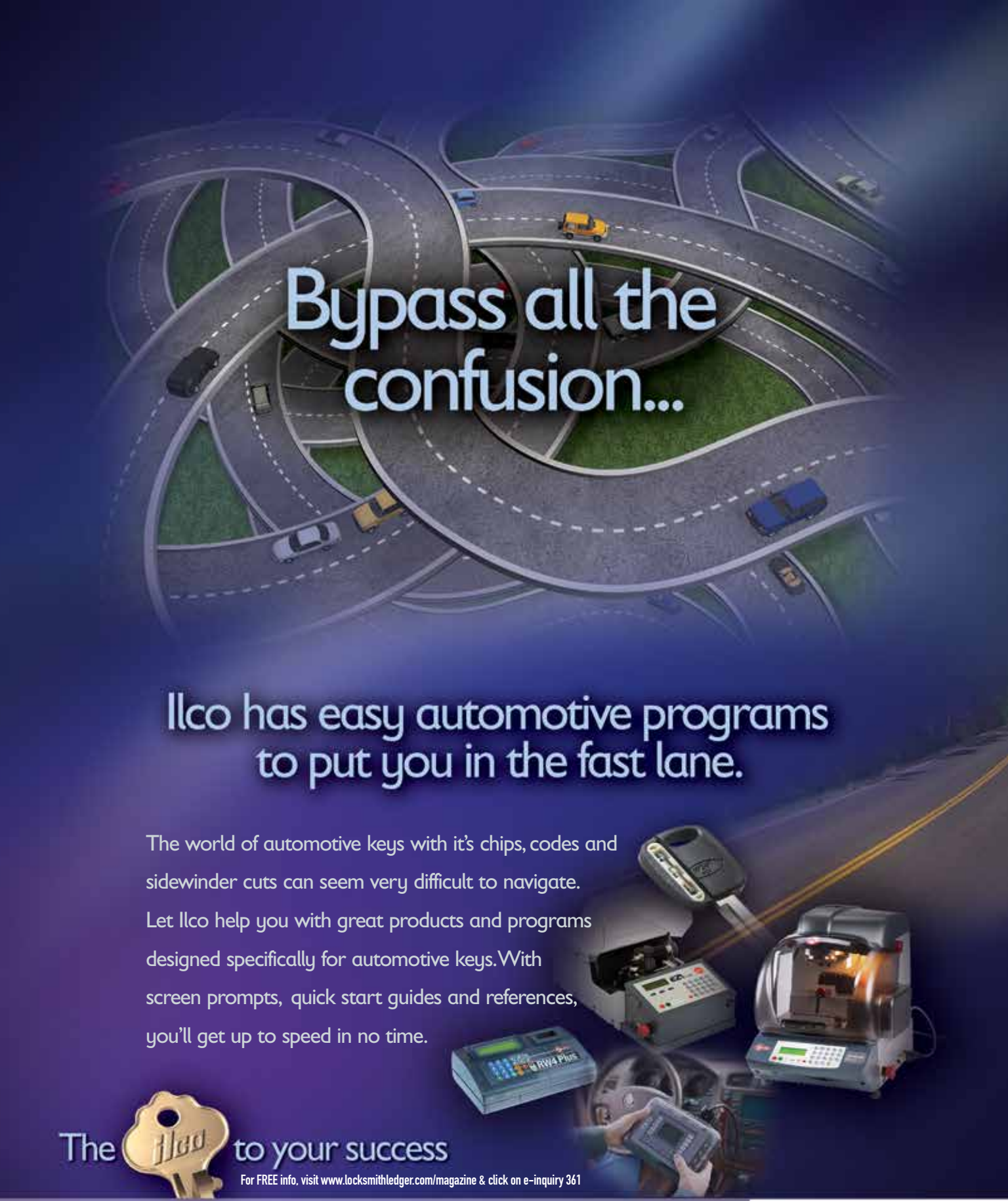


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*Photo 37. Transceiver ring (if equipped) must be released to access poke-hole.*


*Photo 38. Poke-hole is hard to see, located at the tip of the arrow .*

*Photo 39. Lock cylinder removed from column.*

*Photo 40. Ignition lock as seen from rear.*

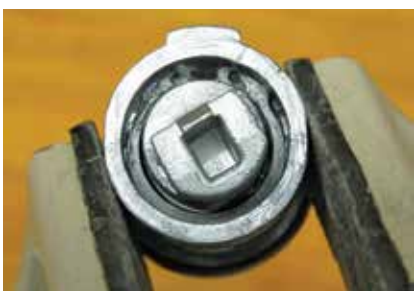

*Photo 41. After timing ring has been removed, you will see an internal Truarc ring.*

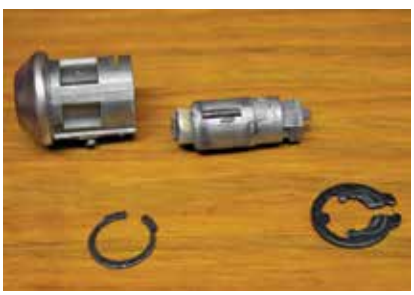

*Photo 42. Tibbe ignition cylinder components.*

components of the lock including the plastic bushing and the sidebar pin.

Now that the plug has been removed from the lock, we can service any damaged components, decode the lock, or rekey it by removing and / or replacing the discs (Photo 34). Make sure that there is one spacer between each disc and that the discs are inserted into the lock with the numbered side toward the face of the lock. A lug cast into the inner wall of the chamber fits between the two stops on each disc (Photo 36). As the key is rotated, the discs move as far as the stops will allow. When the correct key is used, the individual sidebar notches will align under the sidebar, allowing it to drop within the chamber. Once the sidebar has dropped into place the lock plug can rotate along with the discs, which will unlock the door.

One interesting thing to note about the Tibbe locks is that the sidebar can only drop in when the key is turned in one direction. This allows the doors to be locked by any key, but unlocked with only the correct key. If you are using a Tibbe pick to pick and / or decode the lock, you will always want to try a key in the lock first to see which direction you need to pick the lock.

## IGNITION LOCK

After the steering column shroud has been removed, the transceiver ring (if equipped) must be released to gain access to the poke-hole for the active retainer (Photo 37). Two tabs on the transceiver ring snap onto the two lugs on the lock housing. Carefully pry up each tab and pull to release the transceiver ring. Photo 38 shows the lock cylinder in place with an arrow to indicate the position of the poke-hole for the active retainer. When the lock has been turned to the "ON" position, the retainer can be depressed with an offset scribe or a Shrum tool. After the retainer has been depressed, the lock will pull free of the steering column (Photo 39).

With the lock removed (Photo 40), you may notice a striking resemblance to the Ford Focus and other flat-faced Ford ignition locks. Many of those vehicles are sold in Europe with Tibbe locks in place of the 8-cut locks that we are familiar with here in North America. The steering columns were designed to accept both the 8-cut ignition and the Tibbe ignition cylinder.

A major difference between the Focus-style ignitions and the Tibbe ignitions is that after the timing ring has been removed from the end of the plug, a second internal Truarc ring must be released to remove the plug from the housing (Photo 41). Unfortunately, this is as far as you can go. The shutter assembly is crimped onto the top of the lock chamber (Photo 43) and if you were to remove it, I doubt that you could put it back together in such a way that it would function properly. ■

*Photo 43. Shutter assembly is permanently attached to lock chamber, which prohibits further disassembly.*

For servicing the fuel lock and hood lock, see the expanded online article at **www.locksmithledger.com/ 12057410**

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