

Automotive

Supplement to Locksmith Ledger International

May 2020

LOCKSMITHING

2020

A view Into the Future

**Smart Pro
vs. Chrysler**

**STRATTEC
2020 Update**

**Auto-Lock Repair
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- S4 Smart Pro vs. Chrysler**
Advanced Diagnostics' device did its job after the call came to help out with a notorious vehicle.
- S12 STRATTEC Update**
New solutions are provided for door and ignition locks on 2020 Ford Escape and Lincoln Corsair models.
- S14 Auto Lock-Repair Opportunities**
ASP's catalog has the information required to service your customers' older vehicles.
- S20 New Technology Requires New Approaches**
Programming and diagnostics are faster and better thanks to new tools, software and connectivity.

In Our Regular May Issue

- 48 Remote Generation**
In addition to reducing your inventory, the procedure allows you to improve your profit margins.
- 52 Distributor Corporate Profiles**
Take a look at three distributors specializing in the automotive market: American Key Supply, Midwest Keyless Inc. and Transponder Island.

» Advertisers Index

Company Name	Page	Web Site URL
American Key Supply	S15	www.locksmithledger.com/12369841
ASP	S11	www.locksmithledger.com/10915082
Autel US Inc.	S2	www.locksmithledger.com/21091903
HPC, a Hudson Lock Co.	S13	www.locksmithledger.com/10172692
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Midwest Keyless	S21	www.locksmithledger.com/12103643
Southern Lock & Supply Co.	S19	www.locksmithledger.com/10174614
Steck Manufacturing	S18	www.locksmithledger.com/10173492
STRATTEC Security Corp.	S23	www.locksmithledger.com/10173503
Transponder Island	S9	www.locksmithledger.com/11383966

Smart Pro vs. Chrysler

Advanced Diagnostics' device did its job after the call came to help out with a notorious vehicle.

BY STEVE YOUNG

On Friday, Dec. 6, 2019, I was getting ready to go to work, when I heard on the radio that there had been a mass shooting at the Naval Air Station Pensacola (NAS) where I used to work. Before long, we learned that an aviation student from Saudi Arabia opened fire on his unarmed classmates. The Escambia County Sheriff's office responded and eventually shot and killed Mohammed Saeed Alshamrani but not before he snuffed out the lives of three U.S. Navy service members and wounded eight more. Eventually, all 21 remaining Saudi flight students across the country were deported back to their home country after the attack was determined to be one of terrorism.

Apparently, none of the deportees felt obligated to pay off their vehicles, and all vehicles were repossessed, without keys. A friend of mine got the job to make keys for some of those vehicles, which was complicated by the fact that most had in-dash navigation systems that had been pulled out so the FBI could download the data to see where the vehicles recently had been. The FBI returned the navigation units after downloading the data but didn't reinstall them. My friend soon discovered that he couldn't program new keys into several of the vehicles, particularly the Ford models, until the navigation units had been reinstalled.

After the problems with the navigation units had been solved, my friend still had one vehicle he couldn't



This 2018 Chrysler 300 had been repossessed from a Saudi flight student.

program — a 2018 Chrysler 300. He called to ask whether I could do it. It took only a brief check to learn that the Advanced Diagnostics Smart Pro, indeed, could program that vehicle and video of the process had been posted on Advanced Diagnostics' YouTube channel. After watching the video, however, my dislike for Fiat, the owner of Chrysler, increased dramatically.

One of my first cars had been a 1969 Fiat 850 Spider, and that was all it took to ensure that I never again would own anything that Fiat made. But, when I learned that to program a new prox fob into this 2018 Chrysler 300, I'd have to do it from the trunk of the car using a self-powered programmer, my dislike of everything Fiat hit a new high.

Ever since Fiat took over Chrysler in 2014, the management of Fiat Chrysler Automobiles (FCA) has implemented European policies and procedures in a blatant attempt to force owners to return to the dealerships for service. Despite the advent of the National Automotive Service Task Force and the Motor Vehicle Owners Right to Repair

Act, FCA has done everything it can to make it difficult, if not impossible, for anyone other than a dealership to service its new vehicles.

For locksmiths, this began by shutting down access to the Sentry Key Immobilizer Module (SKIM) code, or the PIN that's necessary for programming. More recently, FCA began to use the so-called Star connector for programming anti-theft systems. FCA also hid the connector in places that are difficult to find and difficult to access.

TO THE RESCUE

The good news is that we have some dedicated vendors out there, such as Advanced Diagnostics, that refused to let FCA shut out locksmiths from helping the owners of Chrysler vehicles. Thanks to research and development, many products and procedures now are available to automotive locksmiths to overcome intentionally placed roadblocks. In fact, many Chrysler products have become easier to service, because the latest generation of programmers either bypass or pull the SKIM code



The Smart Pro from Advanced Diagnostics

directly from the vehicle, which makes it unnecessary to deal directly with the manufacturer or a code service.

Unfortunately, the 2018 Chrysler 300 still is a pain to service, but it can be done if you have the proper equipment and aren't too old or too big to crawl in and out of the trunk of the car. Because I work part time as Santa, I'm almost too old and almost too big, but I still got the job done. However, some of the language that I used during the job wasn't fit for the little kids who had so recently sat on my lap!

The Advanced Diagnostics Smart Pro is the updated replacement for Advanced Diagnostics' T-Code Pro and MVP Pro. The Smart Pro came out at about the same time that FCA started implementing its Star connection, so cables for new Chrysler vehicles aren't part of the stock package. They're available separately.

The cable required for the 2018 Chrysler 300 is the ADC2011, which isn't technically a Star connector cable. It uses a proprietary connection that plugs into a special connecting block that might be located in various places in the vehicle. The cable plugs directly into the OBD-2 cable that comes with the Smart Pro.

Different FCA vehicles might require the ADC2012 cable, which uses the Star connector and is plugged into the system typically near to the OBD-2 port. This cable also plugs directly into

the OBD-2 cable that comes with the Smart Pro.

Advanced Diagnostics recently began advertising that the Smart Pro has "30% more programming capability versus the leading competitors." I've had my Smart Pro only for a few months, and statistics was one of those subjects that I had problems with when I was in college. But my gut feeling is that number is about right. Ever since I got the machine, I've compared it with the other programmers that I have, and, indeed, I've found many vehicles that I could program easily with the Smart Pro that I either would have had to walk away from or use a specialty tool on.

PREPARATION IS VITAL

When I learned of the job, it was already early afternoon, and by the time I had researched what was required and was ready to go to the vehicle, it was near the end of the day. One of my problems was that the fob I had in stock had remote start, but the vehicle wasn't equipped for remote start. I found this out by calling a local Jeep dealership that I have a good relationship with. My friend in the parts department there was able to give me the Chrysler part number for the correct fob from the vehicle identification number (VIN) so I could cross-reference it with my vendor's part numbers. I explained the problem to the repossession company, but they told me that the main priority was to get the vehicle running as soon as possible, so they didn't care about an extra button on the remote that wouldn't do anything. I always try to be professional when I deal with a customer, so I like to do any necessary prep work before I show up on the job. Because this was the first Chrysler 300 that I tried to program, I also watched the video on the Advanced Diagnostics YouTube channel. As it turned out, I didn't quite do my homework as well as I thought.

When I arrived on site, the sun was



The ADC2011 cable is necessary to program the 2018 Chrysler 300 and some other Chrysler vehicles. The end that plugs into the vehicle is shown in the inset.



The ADC2012 cable is required to program certain Fiat Chrysler Automobile vehicles. The end that plugs into the vehicle is shown in the inset. It has a male and a female Star connector and is inserted between the two connectors in the vehicle.

going down. The vehicle was located at the back of the repo lot, and thanks to a recent rain, it was a bit like working on a car in a swamp. When I opened the trunk, I discovered that the previous owner kept a lot of stuff in there. My friend who originally got the job and I had to remove workout clothes, books, household items and just plain junk from the trunk to gain access to the connector. Next, we had to remove the panel that formed the floor of the trunk and covered the spare tire and battery. With everything out of the trunk, I could see the wiring harness running forward from the battery to a point where it disappeared under the seat cushion of the rear seat. Just before the cables



The junction box where I had to connect the Smart Pro was as far inside the trunk as you can get and under a flap of carpet.

disappeared, I saw two junction blocks where I knew that I'd have to connect my programmer.

After placing my wadded-up sweatshirt over the threaded shaft that held the spare tire in place, I was able to crawl inside the trunk without impaling myself. I peeled back the carpet to expose the connectors and plugged in my Smart Pro, while holding a flashlight in my mouth. After working my Santa-size belly back out of the trunk, I turned on my programmer and started to work. It worked only for about a minute and a half. Before I even could start the process, the programmer shut down because I failed to make sure that the battery in the unit was charged before I came out!

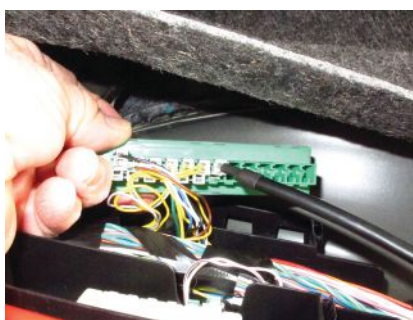
This was the first vehicle where I had no choice but to use the Smart Pro's internal battery. When I got the device, I charged the battery fully before I used it the first time, but on most vehicles, the



This is the connector that I tried to hook up to while working by flashlight. The proper connector is green.

Smart Pro operates off current that's supplied by the OBD-2 port, and I had been lazy about making sure that the internal battery was charged. (Now, I charge the battery every time I charge my jump-box, when I get home on Friday evenings.)

The next hour or so was wasted trying to cobble together some way to power the Smart Pro. For some reason, I hadn't put the power supply in the case with the device, and I wasted a lot of time trying to come up with an alternate



This is the correct connector to attach your cable to. Notice that it's green.

way to power the device. In the end, we decided that it was time to stop feeding the mosquitos and to come back in the morning with a fully charged battery. The moral of the story: Keep the battery in your Smart Pro charged, or keep the power supply with the device!

GETTING DOWN TO BUSINESS

Returning to the job the next day with a fully charged Smart Pro and a good night's sleep, everything looked better in the daylight. Even the mud was drier! This time, I also came armed with a couple of garbage bags for all the junk in the trunk, so I had a clear work area. The only real problem was that my friend wasn't there, so I essentially worked alone.

After I had all of the junk stuffed into the garbage bags, I crawled in the trunk and discovered that when I hooked up the Smart Pro the previous night, I plugged it into the wrong connector

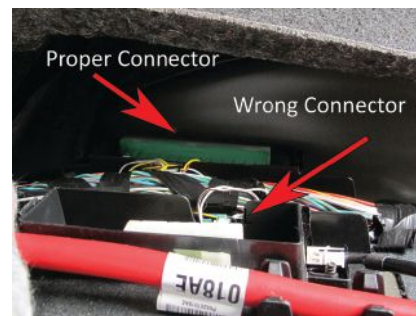
— DUH! There are two similar connectors located almost side-by-side. The connector that you have to hook up to is, naturally, the one that's the hardest to see and gain access to. It's located under a flap of carpet, almost as though the manufacturer was trying to hide it. The main thing to keep in mind is that the proper connector is green. Working by flashlight the night before, I hadn't even seen the second connector.

After making the correct connection with the Smart Pro, I struggled my way out of the trunk and began to program the vehicle. I checked the vehicle's battery voltage the night before and knew that I was dealing with a fully charged car battery, so I didn't hook up a jump-box. But if the battery voltage had been less than 11VDC, I would have used the jump-box.

START PROGRAMMING

After selecting the correct vehicle from the Smart Pro's vehicle selection menu, you get to the main vehicle menu. From here, you can program or erase the prox keys, see how many prox keys are programmed into the vehicle and check for fault codes. Rather than pulling and entering the SKIM code, the Smart Pro simply bypasses it. I chose to program a new prox key and then pressed the Connect button.

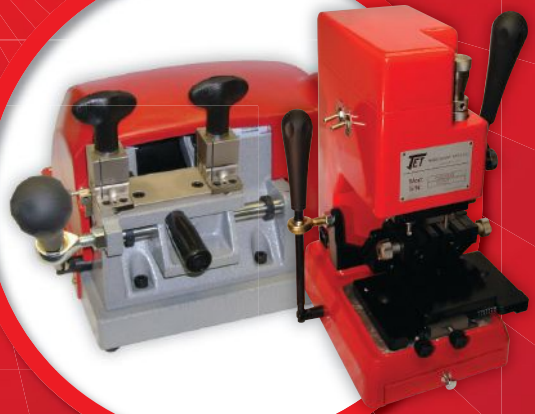
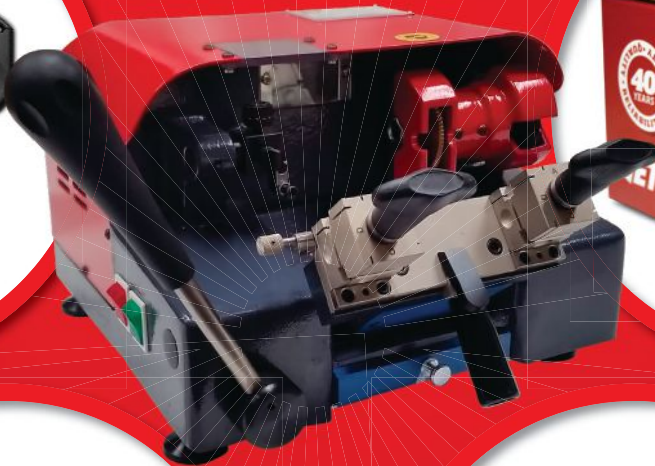
After pressing the arrow button to continue, I was instructed to "Switch hazards on," which means turn on the



Both connectors are mounted in the vehicle. The green connector that's hidden under the carpet is the correct one to attack, naturally.

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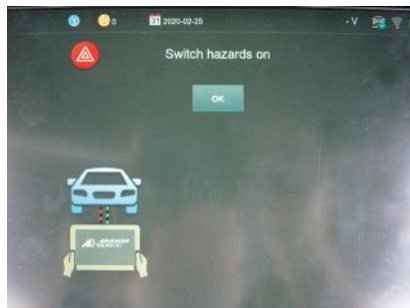
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The Jet Hardware logo, featuring the word 'JET' in a bold, stylized font with a red and white color scheme.

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The Smart Pro selects the correct vehicle. This page has a wealth of information about the vehicle and the programming process, which is designed to make programming easier.



This informational page is designed to remind you to turn on the ignition before you move forward.



This screen tells you how many keys are programmed into the vehicle, among other things.



On this screen, I chose the "Program Prox Keys" option on the right side before pressing the "continue" arrow.

vehicle's emergency flashers. Leaving the Smart Pro in the trunk, I moved into the passenger compartment to turn on the flashers. From what I've been told, this sends a "wake-up" message to the computer so programming can take place.

Returning to the Smart Pro, I pressed the "continue" arrow once again. The next screen showed me the VIN as well as the part number of the immobilizer and the hardware and software versions. It also showed me how many prox keys were programmed into the vehicle. The repo company didn't want me to erase the old prox keys, so I didn't, but I noted that two prox keys already were programmed, so when I was finished, there should be three.

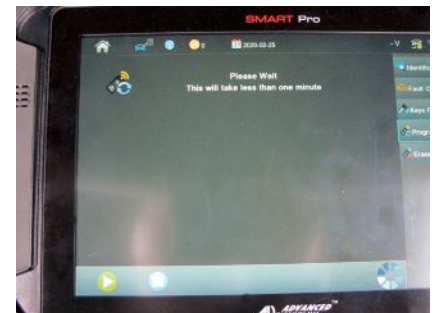
Next, I chose the "Program Prox Keys" option and pressed the "continue" arrow. That brought up a warning screen that told me to "Make sure that there are no wireless devices close to



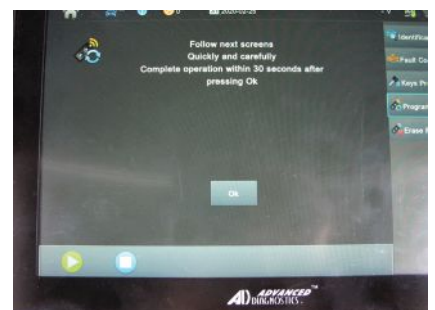
This screen warns you to keep wireless devices, such as your cellphone, out of the passenger compartment to minimize radio-frequency interference. Pressing OK moves you to the next step.

the prox key." This is to eliminate the possibility of radio frequency "noise" interfering in the programming process. I never had a problem with this, but, then again, I use a Bluetooth earpiece and normally leave my phone in the truck anyway. Pressing the "OK" button brought up a screen that told me to wait about a minute. I assumed that the device was opening communications channels to the computer and bypassing the PIN during this time.

After the delay, a new screen appeared that told me that I had to follow the next steps "Quickly and Carefully" within 30 seconds of pressing the "OK" button. Because I prepared by watching video of the operation, I already had the new prox key sitting on the front seat of the vehicle and was ready to complete the next steps. (This is another example why it's always good to review any



This is where the Smart Pro opens communications with the immobilizer module and bypasses the Sentry Key Immobilizer Module (SKIM) code.



This screen tells you to be ready to take the next steps "quickly and carefully." Those steps will program the new prox key into the vehicle. Having watched an instructional video beforehand, I knew what I had to do and was ready.

available videos before you tackle a job for the first time — you'll be prepared for steps such as this one.)

When I pressed the "OK" button, I was told to hold the new prox key near to the start/stop button and to "Continually press and release the unlock button" until I heard the power door locks cycle. I immediately went forward



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AUTOMOTIVE

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This screen directs me to hold the new prox key close to the start/stop button in the passenger compartment and repeatedly press the “unlock” button on the prox fob until the power door locks cycle.



I repeatedly press and release the “unlock” button while holding the prox fob near the start/stop button. When I hear the door locks cycle, I have programmed the new prox key successfully.



The programmer tells me that the vehicle now has three prox fobs programmed into it.

and grabbed the new prox key, sat in the driver’s seat and began to press and release the “Unlock” button on the fob. After pressing and releasing the button a couple of times, the power door locks cycled, and I was a happy man!

Returning to the Smart Pro in the trunk, the screen now told me that three prox keys were programmed. After pressing the “OK” button, I was asked whether I wanted to program any additional keys. I pressed “NO,” and the

programming finished and told me to test the new key. I turned off the Smart Pro and disconnected the cable before I cranked the car. It fired up perfectly.

As I finished up and showed the repo guy that all the functions on the key (except remote start) worked, I noticed for the first time the military patches stuck to the headliner of the car. Looking at that Arabic (I assume) script, I once again was reminded of the shooting and the three U.S. service

members who lost their lives that fateful day. Then, as I crawled in and out of the trunk for the last time to retrieve my programming cable and put the carpet back in place, I thought about how the killer infiltrated our military by pretending to be an ally.

Then I looked at that Chrysler 300 and couldn’t help but think about how Fiat is doing everything that it can to force its way of thinking onto the U.S. consumer. Although Fiat might not be violating the letter of the Right to Repair Act, it certainly is violating the spirit of the law with impunity. As I drove away, I did a lot of thinking about whom our real friends are. ■

Steve Young has been a locksmith since 1973 and has worked and taught seminars in the security industry for decades.



The GPS navigation hangs out of the dash, where my friend simply plugged it back in without mounting it after the FBI returned the unit.



An assortment of Arabic and English military patches that were stuck to the headliner of the vehicle are a grim reminder of why this car had been repossessed.



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STRATTEC Update: Ford and Lincoln Locks and Codes

BY GALE JOHNSON



STRATTEC Security Corp. has been the leading domestic manufacturer of locks and keys for the automotive industry for many years. STRATTEC is said to be the world's largest producer of automotive locks and keys.

One of the strengths of STRATTEC has been its ability to innovate and change with the times. Locksmiths will remember ideas such as internal weather flaps and sidebar locking systems first developed by Briggs and Stratton. As automotive security requirements increased, STRATTEC responded by producing laser-key systems, transponder security and automotive remotes.

For many years, STRATTEC technicians attended locksmith conventions around the country and provided classes in servicing new STRATTEC products. This year, 2020, is no exception. STRATTEC has developed a training program for servicing door and ignition locks now being installed on 2020 Ford Escape and Lincoln Corsair (MKC) models.

Both models use a laser-cut key system. Before discussing lock assembly, an explanation of the key-cut reading is essential. Begin by holding the key bow to the left and the tip of the key to the right. The key code series is 30001-31544. This tip stop key has 10 cuts. Spacing is: 992-902-811-720-630-539-449-358-268-177. Cut spacing is 0.0905.

There are five possible depths: 0.028, 0.051,

STRATTEC now provides ignition and door lock training for the 2020 Ford Escape and Lincoln Corsair.

0.075, 0.098 and 0.122. Depths are actual cuts from the top (primary) side of the key to the outer edge. Depth increments are 0.0236. All measurements are in inches. The key used for practice has cuts bow to tip of 5433124423.

IGNITION LOCK

Tumblers for spaces 2 through 10, bow to tip, use depth tumblers marked "R." Install springs for each tumbler. Select the required tumblers and insert in proper order. Hold down on the installed tumblers and turn the cylinder to show the reverse side. Install the correct depth tumbler marked "L" in the second space. The first space is left vacant. Fully insert the key and determine that all tumblers are flush with the cylinder exterior. Apply supplied grease to the outer surface of the cylinder.

DOOR LOCK

Left and right tumbler types are installed in an L-R-R-L-L-R-R-L-L-R arrangement bow to tip. Install tumbler springs in spaces 1-4-5-8-9. Install the correct depth tumbler marked "L." Hold down the installed tumblers and turn the cylinder to show the reverse side. Install tumbler springs in spaces 2-3-6-7-10. Install the correct depth tumbler marked "R."

2020 STRATTEC CATALOG

STRATTEC has produced yearly comprehensive catalogs for decades. The 2020 catalog contains application charts, onboard programming for transponder-equipped vehicles, plus illustrations of available key blanks, locks and electronic remotes. The STRATTEC catalog is free and can be downloaded at the STRATTEC website, aftermarket.strattec.com. ■



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Automotive Lock-Repair Opportunities

ASP's catalog has the information required to service your customers' older vehicles.



BY BUDDY LOGAN

You might believe that you no longer have to perform automotive lock-repair jobs because you make a good living programming transponder keys. Don't get too confident too quickly. As this article was written, much of the country was on lockdown because of the COVID-19 coronavirus outbreak. Because many of your customers face financial setbacks, a new vehicle might be out of the question for them, which means that older vehicles will stay on the road longer, increasing the demand for repairs.

Even before the coronavirus crisis, some people believed that automotive lock repair was a dead business, citing the elimination of passenger door locks and rear compartment locks on some new models and the increasing use of push-button start instead of mechanical ignition locks. But tens of millions of vehicles that have an ignition, two door locks and a rear compartment lock remain on the road. And they're staying on the road longer. The average age of vehicles on the road in the United States is between 11 and 12 years. If you priced a new vehicle lately, you'll find



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that that average age likely will increase.

The mechanical ignition lock hasn't disappeared from the newest models of vehicles. Although the higher the luxury level a new vehicles is, the more likely it will be to have push-button start, even some high-selling models, such as the Toyota Camry, still have a mechanical ignition lock. Plus, although rear-compartment locks are increasingly rare even on the low-end models, the key-operated passenger door lock still is there. So, the demand for automotive key repairs will be around for many years despite the doomsayers.

The locksmith faces several challenges to be successful in the automotive repair business: determining the parts necessary for a job, pricing the job right and getting timely delivery of parts. ASP Inc. has addressed all of these issues in its newest catalog, now accessible at www.carlocks.com.

IDENTIFYING THE RIGHT PARTS

Through the years, automotive lock manufacturers have come and gone, and now there are two: STRATTEC Security Corp. and ASP. Although some applications are covered by both, ASP and STRATTEC are mostly parallel companies that have similar parts for different makes and models. If you don't know which company has the necessary part, ASP's catalog lists all makes and models. If the vehicle you're working on isn't covered by ASP but is covered by STRATTEC, the ASP catalog will tell you that.

After you know the year and model of vehicle you're working on, go to www.carlocks.com, click Catalog on the home page, then click "LOCKSMITHS IN THE USA AND CANADA." This will take you to a long list of PDF files, starting with Acura Door Locks. Click on the correct vehicle, and the file opens, showing you all of the appropriate information that's available. Some applications are simple and straightforward; others require additional exploration to determine what's required.

For example, let's assume you have a job to replace a Honda ignition lock. Depending upon the year and model, it could be simple or complicated.

Clicking on Honda Ignition Locks takes you to a file listing all models and years, along with the key-blank reference. If you have to know only which tumblers or keying kit to use, check the key-blank reference and then scroll to the end of the file, where the tumblers and keying kits are listed according to which key blank is used. If you require a replacement cylinder, let's start with a simple example — the 2000 Honda Accord. This is listed as Accord 1998-02, using an HO03 key blank, and the ignition cylinder is C-19-120.

Now let's look at a more complicated example — the 1995 Honda Accord. You can't know exactly which cylinder to use until you take apart the old lock, because there's a design variation. This one is listed as Accord 1994-97, using HD103 key blanks. Two different part numbers are listed, with a note to scroll down and read the further information at the end of the grid. Doing that, you see an explanation about the two different designs of the end of the plug. Depending upon the design of the lock you're working on, you might be able to replace the cylinder only, or you might have to replace the housing, too.

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The 1994-97 Honda Accord ignition is probably the most complicated of all to determine which parts to use. Most other applications are much easier. If you can follow how to figure out what to use for a 1994-97 Accord, everything else will be a breeze.

Two additional pieces of information are unique to Honda ignitions: First, here's a warning about reverse-thread bolts holding the ignition lock to the steering column and, second, which models use this design. The use of reverse-thread bolts began in 2012; older locks use traditional bolts. Replacement reverse-thread bolts are available as part F-19-501. More important, if you work on one of the models that uses reverse-thread bolts and you try to remove the lock from the steering column without knowing this, you could end up making a trip to the Honda dealer for a new ignition lock and housing.

To our knowledge, the reverse-thread bolts are unique to Honda and are on only the following models:

- Accord, 2013-20
- Civic, 2012-20
- CRV, 2014-20
- Fit, 2014-20
- HR-V, 2015-20

Let's assume that someone brings you a Honda or Acura ignition lock to service, and you don't know the year and model. These ignition locks have a casting number on the side of the housing, and the Honda Ignition Lock section of the ASP catalog has a chart that associates which cylinder is used for each casting number. For example, one of the more popular housings has the number S5A. On the chart, "Ignition Lock Housing Cross Reference," you'll find that number in the left column. In the middle column, you'll see the key-blank references. Some S5A ignition locks use the HD103 key, which is the C-19-123 cylinder, and some use



The Honda Accord is one of the few models known to have reverse-thread bolts.

the HO03 key, which is the C-19-119 cylinder. Even if you don't know which year and model the lock came from, if the casting number is S5A, you can figure out which cylinder is used.

This example was for a make and model that's supplied only by ASP. For other models, the ASP catalog sections tell you where you can find the necessary parts. For example, a 2000 Chevrolet Camaro uses a VATS ignition that's available only from STRATTEC. If you go to the ASP catalog's Chevrolet Ignition Locks section and find the row for Camaro 1989-02, you'll see that. STRATTEC has a good parts lookup section on its website, aftermarket.strattec.com, where you can find the part for that 2000 Camaro. However, STRATTEC's website doesn't list anything that isn't in its product range. If you aren't sure, start your lookup with ASP. If it isn't there, it will tell you where to find the information.

Unfortunately, some locks are made by factories, such as HUF, that release parts only to the car dealers. An example is the 2005 Chevrolet Equinox. If you go to the ASP catalog, Chevrolet Ignition Locks section, and find Equinox 2005-06, it refers you to the Chevrolet/GM dealer for parts.

DETERMINING YOUR PRICE

The next step is to quote your customer a price for the job. Go to the home page of www.carlocks.com and click on "Pricing," which takes you to a password-protected page that has a price-list file

that you can use as a guide to quoting a job. There are three price columns on this file, and the pricing is structured to give everyone a reasonable profit while remaining competitive.

Dealer price: This is the suggested retail price for a similar part sold by car dealers. These prices are subject to change at any time by the car manufacturer, and actual selling prices by any particular dealer might be higher or lower. This should be considered a guide only to help make sure that your quoted price is competitive.

Max price: This is a suggestion for the maximum price that you should charge your customer for the part to maximize your chance of getting the job instead of the customer going to the dealer. Of course, there's no obligation to follow these prices; they're only suggestions, based on current market conditions.

Locksmith price: This is ASP's suggestion for the maximum price that you should be charged for any part by a distributor. Of course, distributors are under no obligation to follow these prices, but if you believe you're being overcharged, find another distributor.

One other consideration is shipping charges, which aren't included in the above estimates. For a customer whose priority is the lowest price and can wait longer for the job to be finished, you can opt for a slower, less costly method of delivery or include those parts in a regular order. If you require special delivery of a part, that will increase the shipping cost. There's no general rule about this. The best suggestion is to give your customer the option. A repair of a door lock might be able to wait. If the ignition were broken and the vehicle can't be driven, however, repairs might be required ASAP.

When deciding what to charge a customer, remember that times have changed because of the internet. The public has many more resources to price-shop compared with a few years

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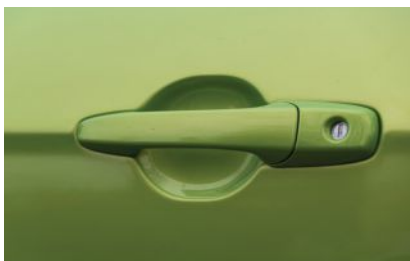
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ago. The car owner now quickly can find out what the dealer charges for a part by looking online. Some dealers appear to discount parts heavily at first sight. Digging deeper, you'll find that much of the discount often goes away by dealers adding exorbitant shipping and handling fees. But the first-impression discount price is often what sticks in the customer's mind, and if you aren't close to that price, the customer might go away. At one time, locksmiths could double their cost of every part. That simplified rule doesn't work now.

All of the files posted on the carlocks.com website are available for download. It might be useful to store the files on your computer, so you don't have to access the internet every time that you seek information. However, you'll have to check with ASP for updates. If you download files, you

should replace any updated file with the new one as soon as possible.

INFORMATION OPTIONS

An option for the part-number lookup and pricing guide is ASP's Autotel program. This program includes information about key blanks, codes, spacing and depths, transponders and remotes, so it's much more than a parts reference. One of the limitations, however, is that the program can't be updated as easily. The most recent update was 2015. A new update should be ready by summer 2020, delayed mostly because of the necessity to add more fields to accommodate the recent expansion of the range of remote keys. For parts information only, it probably is better to use www.carlocks.com as the first stop. More information about Autotel can be found at www.autotel.info.

One more option for all types of automotive lock and key information, including parts lookup, is Michael Hyde's Autosmart. The Autosmart books have been around for years, the latest being the 2019 edition. Particularly helpful is Michael Hyde's new app for Apple iPhone or Google Android cellphones named

MyAutoSmart, available on app stores with activation arranged by National Auto Lock Service (www.laserkey.com). In addition to parts lookup, app sections contain detailed information about transponder systems and programming equipment, making first keys, space and depths, which Lishi pick to use, keys, proximity remotes, etc. At the time of writing, all new ASP applications weren't in this program, but updates were expected. Ease of updating again is one of the benefits of the MyAutoSmart app compared with printed material.

Some versions of InstaCode software and apps also include a section for ASP parts lookup. As of publication, InstaCode wasn't up to date with regard to ASP applications, but that hopefully will be complete soon. More information about InstaCode can be found at www.whsoftware.com.

GETTING THE PARTS

The final step is getting the correct parts into your hands in a timely and efficient manner, so you can complete the job. Most traditional locksmith distributors are ASP distributors, ranging from stocking only a few items to stocking

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almost everything in the product line. ASP doesn't endorse or show preference to any distributor, but every effort is made to inform locksmiths of what to expect from each. On www.carlocks.com, click the Where to Buy heading to take you to more information about the ASP distribution system.

It's difficult to rely on one distributor for all of the requirements of your business. Some distributors concentrate on commercial-door hardware with little or no coverage of automotive products. Some distributors concentrate on automotive. Others are in the middle, offering a little bit of everything. The best suggestion is that if your preferred distributor isn't filling your automotive needs, find another distributor who can.

Remember also that many distributors work with a wide range of products,

and distributor salespeople can't be experts on everything. The ASP catalog is available to all distributors, but it would be helpful for you to figure out what you have to have on your own whenever possible and call the distributor with the parts numbers ready. Obviously, there will be times when you require the distributor salesperson's assistance. A good sales representative always will be happy to help. The better prepared you are, the better chance you have of getting the correct part quickly and efficiently.

One final note: Be careful if a distributor tells you that a part is "discontinued." Over the years, hundreds of parts have been discontinued, and most of those parts remain listed in catalog materials for the benefit of those who still have stock. But some distributor salespeople use the word

"discontinued" to mean that they no longer keep that item in stock. The item still might be in stock at other distributors or at the ASP warehouse and available as a special order. ASP's price list designates parts that actually are no longer available from the ASP warehouse, although it's possible that some might be available as old stock from some distributors. If a distributor tells you that a part is discontinued and it's on the ASP price list as an active part, call another distributor.

So, remember: There still are a lot of automotive lock-repair opportunities today and in the foreseeable future. A satisfied customer whose car lock you repaired today likely will lead to repeat business and recommendations to others for years to come. ■

Buddy Logan is the owner of ASP Inc.

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New Automotive Technology Requires New Approaches

Programming and diagnostics are faster and better thanks to new tools, software and connectivity.

BY MATTHEW SKUNDRICH

Automotive technology appears to change exponentially. For this article, I want to focus on the major changes in automotive programming and keys — more specifically, the changes in Chrysler vehicles — and how aftermarket programming tools have changed.

PROGRAMMING CHANGES

In 2006, I purchased a diagnostic scan tool from Bosch, the EsiTronic 2.0. The Modular Vehicle Communications Interface (MVCI) was a J2534 device, which was new and exciting in the automotive world. About two weeks later, while trying to diagnose a 2005 Dodge Charger, I determined the vehicle required a Powertrain Control Module (PCM) update to correct the customer's complaint. With the customer's approval, I moved forward with programming the Engine Control Module (ECM).

The process was complex. I dragged out my notebook computer, its charger and 75 feet of Ethernet cable to ensure a solid internet connection. After attaching the battery maintainer to the vehicle's battery, I went to the Chrysler Tech Authority website, www.techauthority.com, and downloaded the program, which directed me to download the necessary ECM file. The next step was to set up Java to download the file, which was trial and error along with numerous phone calls. Then I found out

it required an email address that had a .edu extension. Finally, I could program the PCM to the vehicle, which also loaded the most recent calibration.

After completing the program and PCM replacement, I realized the vehicle no longer had a throttle response, because the ECM had to learn the electronic throttle. Fortunately, my Bosch MVCI had the software to relearn the throttle on this brand-new vehicle. This process took about two hours.

Fast-forward 14 years: A body shop called me to program a 2020 Dodge Charger that had a new PCM installed; the old one was crushed in an accident. The only resemblance to the previous example would be the battery maintainer, and I highly recommend to always use a maintainer.

I now use an Apple iPad connected to the internet via the iPad's built-in 4G LTE network. I used the wiTECH 2.0 software along with the Mopar MicroPod II tool, which connects to the Wi-Fi broadcasted from the iPad. Just to be clear, unlike a decade ago, zero cables were involved! The interface and the iPad communicate in the cloud.

I found the necessary PCM and hit a button to start the programming



The Autel IM608

process. Unlike before, the file was sent to the MicroPod II via the cloud, which then uses Java built into the interface to program the vehicle.

The same software (wiTECH 2.0) used to program the PCM was used for all update functions. No other scanner was required. From start to finish, I spent 30 minutes on the job.

By comparison, the 2005 vehicle took 90 minutes longer. There are several reasons why, but all revolve around speed.

First, the speed of one interface isn't even in the same ballpark as the other. Technology changes exponentially with time. My current factory device is much faster than the older models. This means the device can process data faster and send it to the vehicle at a higher rate of speed.

Second, the automobile network is faster. For example, the Controller Area Network (CAN) used in older automobiles can send data at 1 megabit per second (Mbps), whereas CAN FD and Mega CAN, in 2020+ vehicles, can do it at 5 Mbps — five

times as fast. These communication protocols weren't designed when my older device was built.

One might argue that cables transmit data faster than Wi-Fi. That might be true, but Wi-Fi eliminates the need for (and time spent) dragging cables out and around. So, ultimately, wireless saves time, particularly with small file sizes.

MORE SECURE

The increase in device and network speed, along with changes in keys (from keyed ignition to push start), has contributed significantly to more-robust security measures. Let's go back to the 2005 Charger. That vehicle has a four-digit pin code that never changes for the life of the automobile. When I had to do the PCM replacement

function, I used the Autel DS708 to complete the job. All I required was the pin code, which the dealer supplied.

Now, when we jump to the 2020 Charger, there are several differences. First, and probably the most significant, is that the vehicle has what Fiat Chrysler Automobiles (FCA) refers to as a "rolling code." Although FCA calls it "rolling," it isn't a true rolling code. The vehicle is built with a five-digit lifetime code. However, to use the wiTECH software, you must enter a four-digit code. This is where the "rolling code" part comes in.

You secure the four-digit code either through the National Automotive Security Task Force (NASTF) or the dealer. To derive the four-digit code, the five-digit code is run through a logarithm.

Although I'm sure only the logarithm

engineer would know everything that goes into it, what I know is the four-digit code changes daily. Also contributing to the calculated code are where the vehicle was made and whether the pin-code request was from the dealer or NASTF.

The dealer code will be different from the NASTF code, and the two aren't interchangeable. The code logarithm on the FCA server uses two different logarithms, one for dealer requests and one for aftermarket (NASTF), and the server can distinguish between them. For example, if you use a Tech Authority (TA) login and try to use a dealer pin code, it will say "invalid pin."

There's another technological challenge for the aftermarket. After having one of its vehicles hacked and having

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issues with the federal government, Chrysler implemented additional vehicle-security measures by adding a Secure Gateway Module (SGM). This started in 2018 on select vehicles but broadened to all vehicles in 2019.

If you haven't heard of or seen an SGM by now, welcome to a new nightmare if you work only with aftermarket tools. Unless the SGM is unlocked, FCA vehicles won't execute commands sent from any scan tool, except for a viewing function, such as live data or code reading. It won't clear codes or perform any active test or special function. Until recently, the only way to unlock the SGM was through an OEM tool and a TA account.

TOOLS OF THE TRADE

What does this have to do with aftermarket tooling? Nine to 12 months ago, I beta-tested the Bosch ADS 625. The beta FCA software used AutoAuth and had the abilities to unlock an SGM. This was the first workaround that didn't involve a bypass cable.

Currently, to use an aftermarket tool, you have to check that the tool is approved by AutoAuth. For a minimal annual fee, your tool will be registered with AutoAuth. Then, you register your tool's serial number to your account.

For a task that requires an unlocked SGM, the tool will prompt you to log in to AutoAuth. After you're logged in, the SGM will be unlocked, and you can proceed. This is a huge advancement for aftermarket users, offering an alternative to the \$3,600 yearly rate for the wiTECH 2.0 software and TA.

Although the Bosch ADS 625 allows for diagnostics, it provides no help with programming keys. The tool doesn't have the capability to program keys or to pull any pin codes.

Increased security measures, such as the rolling pin codes and SGM, have affected the aftermarket world



significantly by forcing the development of workarounds. For example, to secure a pin code without NASTF, there are two basic options.

First, you can use a cable to bypass the SGM and connect to the CAN after the SGM. The tool's commands no longer are blocked by the SGM, which allows all functions to work, because the command is sent past the SGM on the network. Then you'll have to use a tool, such as the XTOOL AutoProPad, to pull the pin code.

Second, the Autel IM608 and IM508 are approved by AutoAuth. If you have a registered tool, you can pull the four-digit or five-digit pin codes via the on-board diagnostics port. As of publication, these tools were the only locksmith tools that could do this function without a bypass cable.

Unfortunately, there isn't a single tool that does it all — from keys to programming to diagnostics. Autel has the closest solution with the IM608. The IM608 allows key

programming and diagnostics and comes with a J2534 device. It was a true all-in-one tool until the introduction of CAN-FD and Mega CAN. Autel is developing an adapter to enable communication using the CAN-FD protocol and a new J2534 pass-through programming device to work with CAN-FD and Mega CAN protocols.

One solution is to combine Drewtech's Cardaq 3+ with the Autel IM608. The Cardaq 3+ is simply a J2534 box that has CAN-FD and Mega CAN capability.

As a cautionary note, even with these two tools, there remain times when you'll depend on NASTF to complete a job on the newest vehicles — when you require a rolling pin code on an FCA vehicle. Although the Autel tool can pull the lifetime five-digit code on most newer vehicles and program the keys, on new vehicles, a wiTECH 2.0 MVCI still might be required. Remember, the five-digit code that the Autel tools can pull won't work with your wiTECH 2.0 MVCI; that will accept only a four-digit code.

Don't lose hope. Most of the vehicles that require NASTF are under warranty. Most shops won't see those vehicles for a few years yet. For the minority of shops that do, your options are to spend money on multiple aftermarket tools or on a single Chrysler OEM tool.

So, technology certainly has changed. Aftermarket toolmakers, such as Autel, have responded to the changes. But don't sell your old stuff to pay for new stuff. Speed and current technology are great, but they also can cause problems with older vehicles. I keep older equipment, because sometimes speed kills. ■

Matthew Skundrich is the owner of Mobile Advanced Diagnostics & Programming in Orlando, Florida. He has worked as an automotive diagnostician for 15 years.



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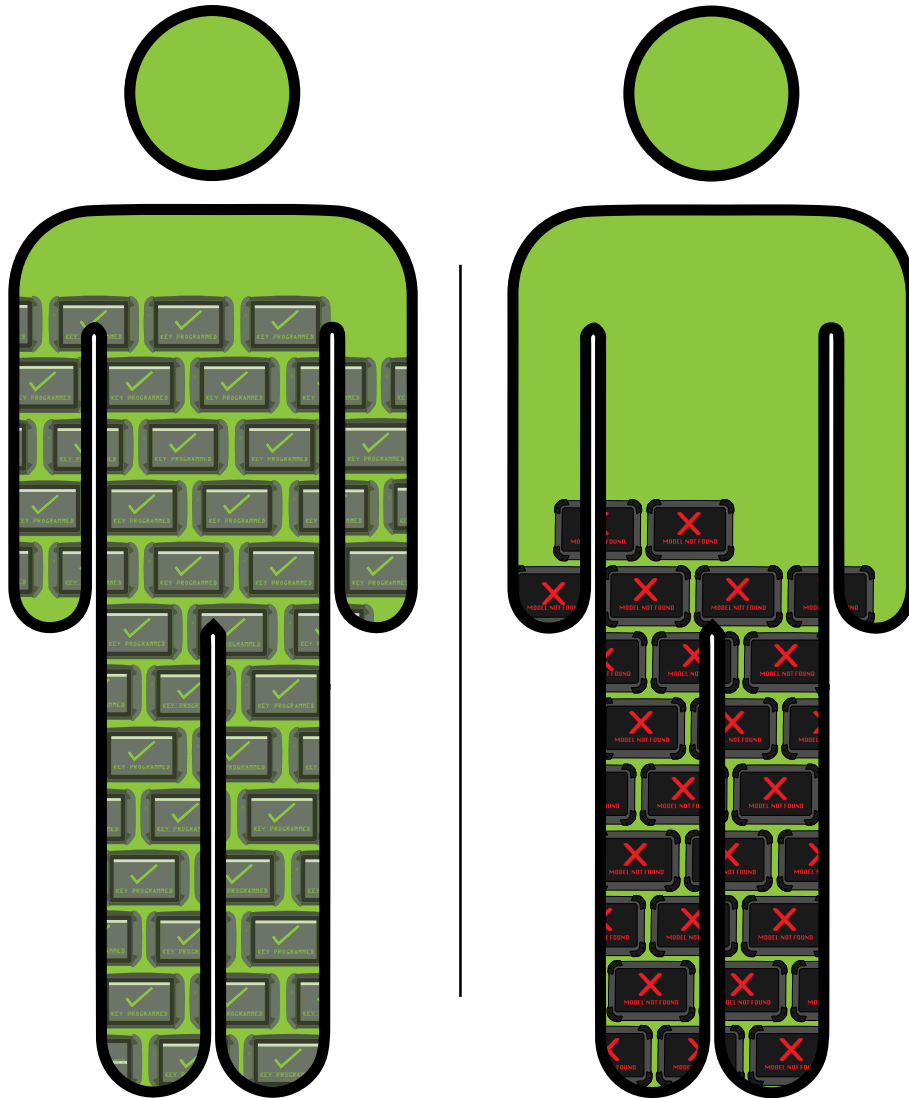
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