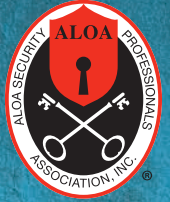


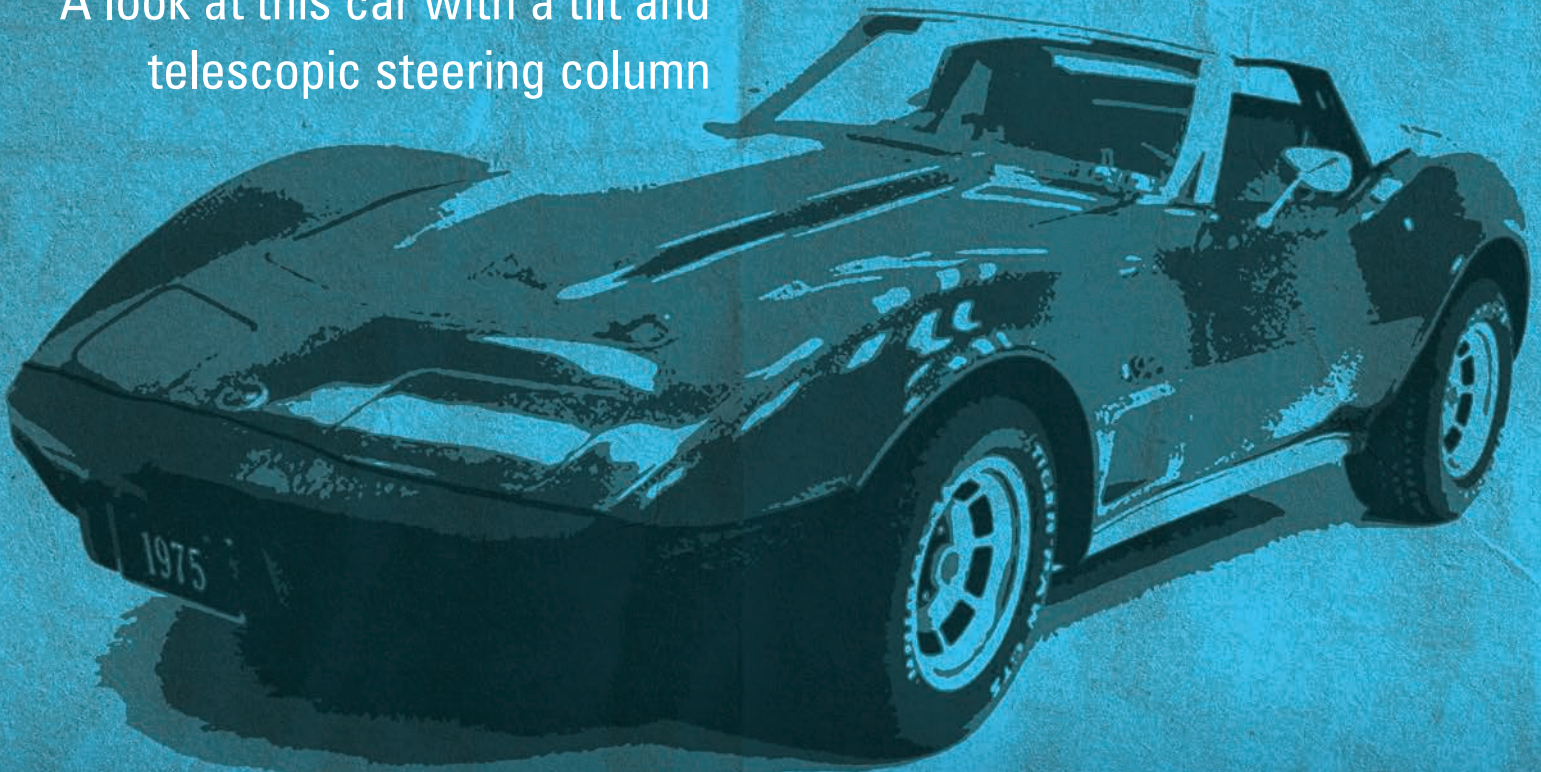
KEYNOTES

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Replacing an Ignition Lock on a **CLASSIC CORVETTE**

A look at this car with a tilt and
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Dealing With a Dodge ProMaster Ignition Failure

A walk-through for removal and repair

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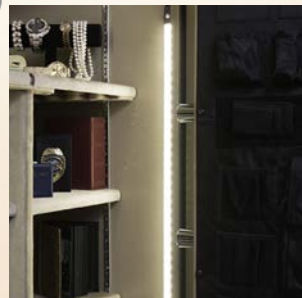
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In Honor of Aaron Fish

HERE WE ARE IN NOVEMBER, and 2020 doesn't seem to be getting much better. We are all still suffering from various parts of this pandemic. And our industry keeps suffering irreplaceable losses of late. Last month, we noted the passing of Mark Miller of Lockmasters and former ALOA Board Member John Arnold. This month, we are mourning the loss of another industry legend, Aaron Fish.

For those who don't know, Aaron Fish had a huge impact on our industry. From inventions and patents to establishing Ucan and purchasing and developing companies such as Simplex and Ilco, he has left a lasting legacy. And one big part of that legacy is his lifelong dedication to education and his donation of time and funding for the Aaron M. Fish Security Training Center at ALOA headquarters in Dallas.

This education center would not have been possible without his vision, passion and dedication. He was instrumental in this project, and ALOA will be forever grateful for this training center to help make education more accessible to professionals across the industry. Thank you again to Aaron and the entire Fish family.

You can read longer tributes to Aaron Fish and Mark Miller in this issue of *Keynotes*. Please take the time to read about the men they were and their lasting impressions on our industry.

"Thank you for bearing with us through these trying times, and we are hopeful 2021 will allow us all to get back to 'normal' a bit more."

Changes Keep Coming

ALOA operations keep on going as usual, and we've continued to adjust as needed during this new world order. It's about time for our fall ALOA Board meeting, and things will look a bit different this year. Instead of us all traveling to Dallas, we will be saving money (and our health!) by meeting via video conference. We'll have two Zoom calls to discuss ALOA business and plans for next year.

The board and staff have been working hard to keep ALOA strong and viable through this pandemic. We have had to make many changes, but because we've been proactive, the association continues to provide needed services and benefits to members. Thank you for bearing with



us through these trying times, and we are hopeful 2021 will allow us all to get back to "normal" a bit more.

In the meantime, please take advantage of all of the web-based benefits such as webinars and reading this magazine cover to cover. It's so important to keep patronizing the companies and organizations that have continued to support ALOA and our members. If you're in the market for some new products or equipment, please consider buying from our associate members and advertisers.

I hope you all stay safe and healthy. Have a wonderful Thanksgiving and start to your holiday season, and best wishes for an improved 2020 through the end of the year.

Respectfully,

Jim Wiedman, CML
President
ALOA Security Professionals
Association, Inc.
president@aloea.org

Introducing a New ALOA Podcast

IT'S NOVEMBER, AND THE COVID-19 pandemic still rages on. I hope that everyone is taking care of themselves and that all of your loved ones are well. It's also now flu season, so consider getting a flu shot this year — we want to see all of our members safe and healthy into next year!

Despite the toll this pandemic has taken on our nation's people and economy, the world goes on. ALOA board and staff have been hard at work to minimize the impact that this has all had on our organization and, therefore, on our members. While we've sadly had to cut staff and have suffered the loss of convention income, we've managed to keep your benefits in place. We even plan to take the magazine back to print production next year (though we'll keep the digital edition too!).

Not only have we kept benefits, we've also been creating new ones and adapting to this new world. In-person events have been difficult this year due to health and safety concerns, but ALOA has ramped up its online education with a good number of new webinars. Hopefully, you've been able to take advantage of a few of

those and earn some CEUs. If you haven't, we are always hosting new ones. Take a look at the calendar on ALOA.org to find out more and register, or contact education@aloe.org with your questions and suggestions. Or perhaps you'd like to teach a webinar!

You will also soon see the introduction of an ALOA podcast. Hosted by Bill Lynk, this series will interview industry experts on a range of topics relevant to the security industry. It will be available on many of the popular podcast content apps, and we plan to regularly release new episodes. Read a bit more about it in the "What's New" section of this issue, or email education@aloe.org.

Renew Your Membership

By now, you've likely received your ALOA membership renewal materials. Please be sure to review and send in your renewals by December 31 to keep your membership active. You'll also see that there are add-ons available, including packages for additional educational opportunities such as webinars. You can renew online at aloe.org, or you can send in the paper forms if you'd prefer. If you have any



questions, please feel free to reach out to us at membership@aloe.org. We are always here to address your questions, concerns and suggestions.

Included in your renewal packets are reminders of some of the benefits you receive, from free professional bonding and *Keynotes* magazine to discounts on education and a FindALocksmith.com listings. One item I'd like to highlight again is access to health, vision, dental, life and other insurance programs through LIG. Right now, we are in the open enrollment period, so please take advantage of this affordable benefit! Read "What's New" in this issue to find out how to sign up.

Please continue to stay safe. We look forward to seeing everyone as soon as it's safe to do so. We're so looking forward to the 2021 conventions!

Mary A. May

Mary A. May
Executive Director
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Get Excited for SAFETECH 2021!



SAFETECH 2021 IS STILL A GO AS OF NOW, SO MARK YOUR CALENDARS! COME Renovate Your Career in Reno, NV, April 12-17 with classes and networking. We have a great lineup of classes this year, from safe deposit classes and forensics to manipulation and advanced safe drilling and defeat. There's something for everyone, from business owners and experienced safe techs to those just beginning their careers. If you were looking forward to taking a class at the 2020 convention, take a look at the lineup for this year!

SAFETECH 2021 will be held a bit away from the main strip at the Atlantis hotel. Make your reservations now by calling (800) 723-6500 and mentioning "SAVTA" or "SAFETECH." Room rates are \$139 per night Friday to Sunday and \$109 per night Monday to Thursday, with no resort fee.

Reno is a fun city by itself, but it's also a gateway to a number of outdoor activities. Spend some time on nearby Lake Tahoe, or go hiking, rafting or golfing at one of the area's 45 golf courses.

The full registration brochure will be available in January so you can plan your classes. For questions, please contact conventions@aloe.org. See you in Reno!

Open Enrollment Is Here for ALOA Members

IF YOU WEREN'T AWARE, ALOA SPAI PROVIDES access to affordable health insurance options as a member benefit — and open enrollment is here! As members, you can secure coverage for yourself, your family and your employees through LIG Solutions.

Coverage options vary by state but include major medical, Medicare/Medicare Advantage, short-term health plans, vision, dental, disability, life insurance and more. For those over 65, open enrollment is October 15 through December 7, and for those under 65, it runs November 1 through December 15. For more information, visit www.ligmembers.com/aloe or call LIG at (888) 582-9813.

NEWS BRIEFS

- **Securitech** was recognized in the 2020 Security Sales & Integration Product Awards. For its AUTO-BOLT MAX. The awards measure how manufacturers' devices perform in actual deployments in the field.
- Representatives from the Wilson Bohannon Lock Company went to the White House October 5 for the Made in America Product Showcase, where businesses from each of the 50 states were invited to display their American-made products. Wilson represented Ohio and displayed their brass key padlocks. To be eligible for the showcase, the product must be "all or virtually all" made in the United States, according to the Federal Trade Commission.

IN MEMORIAM

- **John S. Dorsey, CML, CPS**, passed away October 16. He had been a member of ALOA since 1977 and a SAVTA member since 1994. He was 76.
- **James Jacobs, RL**, has passed away. He had been a member of ALOA since 2000.

Stay Tuned for the ALOA Podcast Debut

DID YOU HEAR? ALOA HAS A PODCAST! CALLED “Locksmith Talk With ALOA,” the podcast will cover topics of importance to the industry. Host William M. Lynk, CML, CPS, CMIL, ICML, M.Ed., will interview security industry professionals in each episode.

Episodes will be released soon, but you can go ahead and subscribe on one of the various podcast directories such as Spotify, Stitcher, Apple Podcasts or Google Podcasts. Simply search for “Locksmith Talk With ALOA” and then subscribe to be notified of new episodes. For more information or assistance, contact education@aloe.org.



PRODUCT BRIEFS

» **Access Tools** has introduced the Easy Off Twist Socket Set, designed to aid in the removal of damaged or locked lug nuts during roadside services without a key. With our exclusive sure twist grip technology locked wheel lugs spin off with no effort.

Five socket sizes fit most lock lug nuts on the market. Sizes include 17 mm, 19 mm, 21 mm, 23 mm, and 26 mm.



» In 2018, **LockOne** launched the LKM10K Lock Series to address Federal Specification FF-L-2890 revisions. The company has released five new models to address SCIF security/life safety requirements: Type I Push Pull Standalone Access Control Model, Type III Panic Bar Standalone Access Control Model, Type VII Push Pull Lock Down Model, Type IX Push Pull Exit Only Model and the Type X Panic Bar Exit Only Model. For more information, contact Lockmasters at (800) 654-0637 and press 2.

» **Lucky Line Products, Inc.** has released the Touchless Door Opener and Stylus. This multi-functional brass door opener and stylus features a door hook to pull open doors without touching door handles. The flat stylus tip can push buttons on touchscreens, elevators, ATMs or gas station pumps. It includes a key ring, and measures 4.1" x 1.5" x .16". It is sold one per pouch and is available in packs of five.

» **IDN-Acme** and **IDN-Wilco** have released a new merged product catalog. New products include hands-free, wave-to-open solutions, facial recognition, electronic access control solutions, automotive fobs and transponders, and more. In addition, new cross-reference guides and additional resource guides are included. The most current information can also be found on the online catalog at www.idn-inc.com.



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We Need Your Help

Attention, ALOA Members:
Help us eliminate the industry scammer problem by screening these applicants, who are scheduled for clearance as ALOA members, to ensure they meet the standards of ALOA's Code of Ethics. Protests, if any, must be made within 30 days of this *Keynotes* issue date, addressed to the ALOA membership department, signed and submitted via e-mail to membership@aloea.org or via fax to 214-819-9736. For questions, contact Kevin Wesley, membership manager, at Kevin@aloea.org or (214) 819-9733, ext. 219.

CALENDAR

For a complete calendar of events, visit www.aloea.org.

NOVEMBER

November 4-6

IML Security Expo
Orleans Hotel and Casino,
Las Vegas, NV

DECEMBER

December 7-12

Six-Day Locksmithing Fundamentals
ALOA Training Center, Dallas, TX
education@aloea.org or
(800) 532-2562, ext. 101

APRIL 2021

April 12-17

SAFETECH
The Atlantis, Reno, NV
conventions@aloea.org or
(800) 532-2562

JULY 2021

July 25-31

2021 ALOA Convention & Security Expo
Caribe Royale, Orlando, FL
conventions@aloea.org or
(800) 532-2562



A Case Update

FINALLY, THE PRESIDENTIAL ELECTION IS HERE, AND WE WILL hopefully stop all this civil unrest in our great and beautiful country. As forensic locksmiths, we follow the law as part of our daily work ethic. Many of us have a law enforcement background, and I know I thank God that I'm not out on the streets dealing with this upheaval.

As I indicated in my last page, I have a case involving a sliding glass door lock that locked upon closing, securing the door so the occupant was trapped on a fifth-floor balcony with no access into the building.

I went to the site yesterday and removed the existing lock for forensic examination and now have it in secure storage until an order is given on next steps. There is talk of X-raying the lock body for hidden obstructions or just disassembling and photographing each component. The advantage of X-raying is that it will show obstacles or blockages in the lock body. What it will not show is wear of internal parts. Photographing and measuring these parts will check for tolerances and undue wear.

Because this is an active case, I cannot share details, photographs, opinions and/or conclusions at this time. I have had cases in the past on padlocks, door closers, doors and frames, glazing in doors, safes, fire code violations and lock malfunctions. As I indicated, I do not do automotive forensic investigations because that is a field within itself, and I will be the first to tell you that I am not an expert in automotive locks. We have many CFL automotive experts in IAIL to whom I am more than happy to refer this type of work.

New Credential and Logo

Last month, I mentioned that our new CFL-Architectural is now Certified Forensic Fire Door Inspector (CFFDI) and that we will be releasing a new logo to go along with it. Let me know if you have any questions.

The reason for this change is that fire door forensic inspection is the pinnacle of knowledge, and a CFLs who are also certified as a LSFDI or CFDI can be awarded the CFFDI credential if they have passed the CFL Architectural exam and either of the LSFDI or CFDI exams. There seems to be more demand for this level of inspections today. Building and fire codes along with doors, frames and hardware is an incredible amount of knowledge, and putting this all into one credential will give the hiring entity a sense of relief that they have hired the right person.

To be a member of IAIL, you must also be a member of ALOA/SAVTA. Our additional dues are \$50 a year, and our membership is open to any ALOA/SAVTA member. We hope to start offering our courses online soon, but we're not there yet. Hopefully, next year will bring our annual conventions back with on-site education so you can enjoy your forensic classes once again.

"Hopefully, next year will bring our annual conventions back with on-site education so you can enjoy your forensic classes once again."

If you have any comments, suggestions or questions, please contact me at ial-president@aloea.org or reach out to one of our directors near you. ☎



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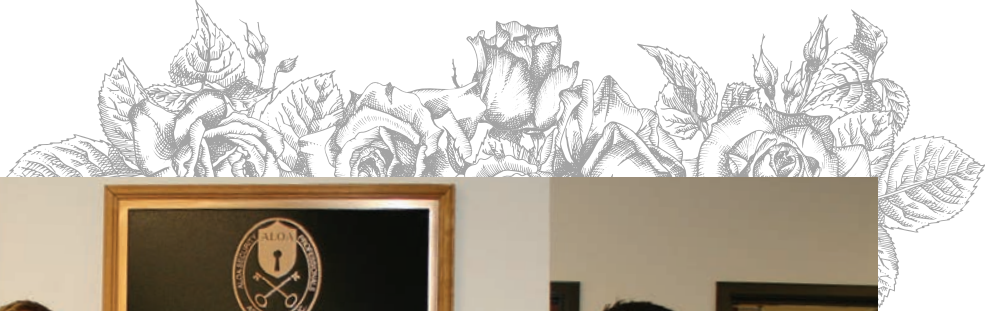
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In Memory of **Aaron Fish**



Take a look back at the life and accomplishments
of this industry legend. **By Tom Demont**

AARON MAX FISH, SEPTEMBER 14, 1932, TO OCTOBER 1, 2020, WAS known throughout our industry as the locksmiths' locksmith and was beyond a legend in the world of locksmithing! Growing up in Montreal, Quebec, Canada, his passion was locks and keys, and his early experience was hanging out, helping his father and Uncle Nusi in the S. Fish general repair shop. He learned how to duplicate keys and do general lock repair, and by the time Aaron was 11, he was making house calls to make repairs and open locks for homes and cars.



His family attended the dedication of the Aaron M. Fish Security Training Center at ALOA headquarters.

Uncle Nusi left the repair shop and went to work for Dominion Lock as an outside salesman, calling on locksmiths and shoe repair shops. When Uncle Nusi was in the Montreal area, Aaron would travel with him from time to time, learning the sales side of locks and keys.

Around age 17, Aaron opened A. M. Fish Wholesale Lock Supplies. He bought from Uncle Nusi and resold to locksmiths.

Aaron and Uncle Nusi became a powerful force that threatened Dominion Lock, and Uncle Nusi was terminated along with Aaron's sales agreement with them. Aaron swore that, one day, he would put them out of business.

He grew his wholesale business by developing more manufacturers to help them compete with DL in Canada. This led to Aaron developing the Canadian Key & Lock Supply (CKLS) brand of key blanks and padlocks to help boost busi-

ness. Some of you old-timers might remember that MD Kramer carried this line of products.

Founding Unican

By the 1960s, Aaron worked diligently to develop a push-button mechanical access control lock, as there was demand from Bell Canada. Finding a small cabinet lock manufacturer in New York called Simplex gave him the basis for the newly patented push-button mortise door lock.

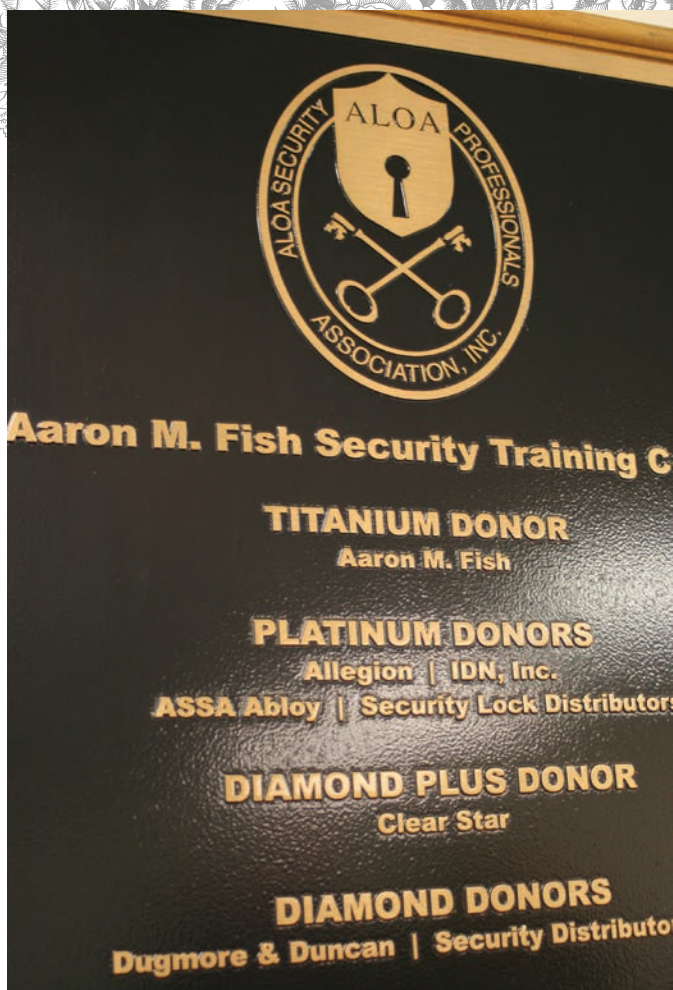
Unican was formed, and by 1965, it was off to a great start with contracts from Bell Canada and various U.S. government agencies.

It was time to expand into a new era with an initial public offering of Unican Security Systems Ltd. Stock was offered at \$2.25 per share Canadian. Though a scary time for Aaron and his team, the offering was a success and launched Uni-

can as a major player in the security hardware industry.

By 1971, Unican had its eyes on Ilco as part of its expansion into the U.S. market. There was pressure from the U.S. government to only buy American-made products, and future sales of Unican products were in jeopardy. To secure its right in the U.S., Unican purchased Simplex Security Systems Inc., the manufacturer of its main component to the push-button door lock. It then created an assembly plant in the U.S. to assemble these components.

By early 1972, the sale of Ilco to Unican was complete. With a vast holding in the U.S. after buying Simplex, Ilco and Kiel in a short time, Unican become the dominant player in the security hardware market. In early 1980, Sager fell to Unican, making it the largest key-cutting machine manufacturer in the Americas. Then, in 1984, Dominion Lock fell to Aaron after



Aaron Fish was an industry legend whose accomplishments will leave a lasting legacy for years to come.



Aaron Fish spoke at the dedication of the new ALOA education center in Dallas, which was named for him in honor of his generous donation and dedication to education.

years of negotiating, and the convergence from DL to Ilco began.

The next series of acquisitions was rapid with Orion (a key blank and key machine manufacturer in Italy), Taylor Lock (a key blank and key machine manufacturer in Philadelphia), Bassick-Sack (a furniture hardware manufacturer in North Carolina), the Locksmith Ledger, PPL (Jimmy Taylor's safe lock and safe deposit lock manufacturing company in Kentucky) and Mas-Hamilton in Kentucky.

In 2001, Aaron sold the Unican group of companies to the Kaba Group, which was absorbed by the Dorma Group and is now known as dormakaba. Aaron established the Aaron M. Fish Family Foun-

dation, which contributes to the Royal Victoria Hospital, Jewish Children's Hospital, an engineering scholarship fund and the Lock Museum and Education Center in Montreal.

A Lasting Education Legacy

In 2014, Aaron reached out to ALOA to help his fellow member locksmiths build a new educational center. As the president at the time, I was honored to work with Aaron and his dear friend Viril Mullins to develop a program and build this new center.

The Aaron M. Fish Security Training Center — built as part of ALOA's headquarters in Dallas — was dedicated in the fall of 2015. More than \$340,000 was

raised to build this impressive state-of-the-art training facility for locksmiths and security professionals. Joining Aaron in this effort were IDN, Security Lock, ASSA ABLOY, Allegion, ClearStar Security Network, Duncan & Duncan and many locksmith companies around the world.

On a personal note, I worked for Aaron as an independent sales representative for his Ilco and Unican-Simplex companies in the mid 1990s. I was impressed with his foresight and drive for perfection, but I really never understood it fully until I met and worked closely with him on the education center project. I can honestly say that he was an inspiration to work with, and we became friends. I will miss him greatly. ☺

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Exit Strategy Basics

Consider your options for funding your retirement and transitioning out of your business. **By Noel Flynn**

IN THIS 15TH ARTICLE IN THE “TOOLS FOR MANAGING YOUR BUSINESS” series, we’ll discuss preparing for and executing your exit strategy and what to expect when transitioning out of your business. There are many aspects of an exit strategy that should be tailored for your business and situation. Thus, readers should seek specific guidance from their business, tax, insurance and legal advisers.

As mentioned in a previous article, according to the U.S. Bureau of Census, about 90% of businesses in North America are family-owned or -controlled. Data also indicates that 60 to 80 percent of small business sales include owner/seller financing. You’ll want to keep this data in mind as you contemplate your exit strategy.

Youthful Invincibility Has a Shelf Life

After much procrastination, you are finally interviewing candidates for a position in your business, and you proudly mention your company’s 401(k) retirement plan. But you witness a recurring lack of interest by younger applicants and conclude that all they

care about is how much money they will make today. Disappointed, you ask yourself, “Why don’t they realize how important a retirement plan is?” Perhaps it’s the same reason that years ago, in your youth, you would have reacted in similar fashion. But now you have different priorities, simply because you are: 1) older and 2) wiser. We can only wonder whether your spouse would agree with the second part.

While this analogy is a bit off target, the underlying message is relevant. Retirement may not be top of mind for you today, but it will be here before you know it. Suffice it to say that, as a business

owner, it's best to begin planning your exit strategy sooner rather than later.

When to Begin

Many experts suggest that business owners begin planning their exit strategy almost immediately after startup. This reminds me of when financial planners tell younger people that they should save at least 15 percent of their income in a qualified retirement plan. Although sound advice, the reality is that you'll likely have your hands full just trying to launch and ensure business survival in the early stages. Yes, you should focus on growing your business, but *don't wait too long to begin thinking about your end game.*

Keep in mind that your circumstances *will* likely change over time. We can all expect to age (some gracefully and others, not so much), and one of the more common occurrences is deterioration of the business owner's health. Life has been known to throw us sudden curveballs, and sometimes these can happen while we're still relatively young.

The point is that we may not always be in control and might be unexpectedly forced to sell or liquidate our businesses. The good news is that many of the steps for growing our business will also help to increase its perceived value, marketability and appeal to a potential buyer.

Building a solid, successful business is consistent with the notion of enhancing options for our ultimate exit. A well-run, financially sound business with appropriate infrastructure will tend to be more successful and appealing to virtually any suitor.

Exploring Your Exit Options

There's nothing inherently wrong with planning a WUID exit plan. You know the one: "Work Until I Drop." Indeed, for many "type A" personality entrepreneurs, this one is very common, primarily because

their business is also their passion. "What would I do with myself if I was not running my business?" Sound familiar?

But here's the catch: None of us knows our "expiration date" (I've looked all over my body for one), so avoid the common trap that risks leaving your kids and/or spouse in a financial mess.

Let's be a bit more direct and ask: "What happens if you unexpectedly drop dead or become incapacitated?" So much for your bulletproof WUID exit strategy!

Yes, you might be able to just cease operations and liquidate when the time comes, but let's think about that for a moment! This approach requires navigating and coordinating the various timing issues and related land mines. You'd probably have some vehicle, equipment or building leases. You'd likely then try to sell your inventory, equipment, supplies, tools and any other hard assets.

But what's that stuff really worth, especially under such "fire sale" circumstances, assuming you can even find a buyer? Having liquidated entire companies, I can surmise that you probably have more worthless crap ("one man's trash is another man's treasure") than you are willing to admit and will likely be very disappointed in your sale proceeds. Think garage sales!

One other familiar potential exit lane looks like this: "My plan is to sell the business to my kids." This option is very common, but it begs the question of how and when (also if) you will actually get paid. Do you really believe that your kids will have the money to buy your business? Will they require a source of funding and, if so, will they (and the business) qualify for a loan? Can the business's cash flow handle debt service for a loan? Will your kids even want to take over your business? You are the one who wanted them to get a good education so they would have attractive career choices!

Remember how hard you worked all

those years to suppress the business's profit (on paper) so you could pay less in taxes? Are the kids really qualified to run your business without you, or will they run it into the ground? Statistically speaking, each subsequent generation of owners increases the risk of failure.

You could do a hybrid exit model where you gradually back off, working fewer days per week but remaining available to "keep an eye on things and protect your flank." Here again, your implicit assumption is that you'll not have been prematurely called back to the mother ship and will be healthy enough to function in a leadership or managerial role.

Some Sensible Steps to Take

Obviously, the younger you are and the more people who depend upon you and your income, the more vulnerable you will be. Even if you have not yet developed a clear exit strategy, there are some things you can do to improve your situation.

One step is to have your business buy life insurance on *you*. It's common for companies to purchase what's called "key man" (you can call it "key woman" or "key person") insurance, and some lenders will insist on such coverage as part of a risk hedge. It's a bit like a home mortgage lender requiring PMI (private mortgage insurance). Typically, if you have a conventional mortgage loan and your down payment is less than the traditional 20% requirement, you'll need to carry and pay for PMI, at least until you develop adequate equity. This reduces the lender's risk, and the borrower is paying for it. If you're the lender, what's not to like?

This reminds me of long ago when I held a mortgage brokers license, which was required when transacting business deals (finance of startups, mergers, acquisitions and business recapitalizations) where assets included real estate.

Although there's no such thing as a free lunch, when you're sufficiently profitable, you can reduce your tax liability and protect your business and loved ones at the same time. Would you rather pay more taxes on your profits or use some of that money to carry insurance? Premiums for key man insurance coverage are a deductible business expense, and the proceeds from such coverage are typically paid to the company upon the demise or incapacitation of the insured. Depending on the structure and ownership of the business (and your beneficiaries), this could be a worthwhile consideration, but consider that such coverage may end prior to your death.

Alternatively, you could carry and directly pay for personal life insurance coverage, with the proceeds payable to whomever you designate, and this coverage could prevail at the time of your death. Either way, life insurance can offer protection for those left behind, especially if your departure is unexpected and when you are younger. Of course, discuss this with your accountant, attorney and licensed insurance agent. Sure, having life insurance is somewhat obvious, *but you would be amazed at how many business owners just never get around to actually doing it.* Talking about it is not good enough, and it's too late when you suddenly wake up on the wrong side of the dirt!

Incidentally, life insurance is not generally considered to be a good investment, although there are so many different types of coverage that you may have access to a policy that offers accumulation of cash values. The policy may even earn interest, which can sometimes partially offset the premiums. Consider life insurance primarily as a defensive strategy rather than an investment. Again, seek guidance from your licensed insurance agent, financial planner, accountant and/or other relevant adviser.

Retirement Planning and Investments

One common exit strategy is to use the profits from your business to fund your personal retirement investments. This approach is appealing for at least two reasons. First, you will possibly reduce your business and personal tax liability, depending upon your business structure. You could effectively have the business (directly or indirectly) fund your retirement investments such as 401(k)s or IRAs, using profits that would otherwise be used to pay taxes. Look at the after-tax impact of various options and avoid or defer tax liabilities until your tax rates may be lower.

The second reason this approach is appealing is that you are building your retirement fund separately and, thus, insulating it from your business. *For those who don't want to have their retirement dependent on the ultimate successful sale of their business, this can be a desirable option.*

In many instances, personal retirement accounts are protected (exempt) from lawsuits, bankruptcy and certain other liability risks. This can be an effective way to protect some of your personal assets and retirement savings, but check with your legal adviser for liability issues.

Another common approach (if your business has a retail and/or warehouse location) is to buy your building(s) personally and then lease/rent the premises back to your business entity. Under this scenario, the business is indirectly paying the mortgage (which is a tax-deductible expense for the business) for your personal investment in a building. The expectation is that your building is likely to be worth more when the time comes to sell it, perhaps as part of, or even the foundation of, your retirement and exit strategy. Your lease would typically also require the business to pay for maintenance and repairs. Frankly, especially if you own a building over decades, don't be surprised

if your building can be sold more easily and profitably than your business.

This reminds me of when I would ask small business owners who sold their business at retirement (and also sold their building) the rhetorical question, "What business were you in?" As expected, they would typically reply, "The XYZ business or industry." But more often than not, the numbers would suggest that their primary business was actually real estate investment, which was funded by their XYZ business!

Think about banks, gas stations, fast-food restaurants, drug stores and other businesses that own well-located buildings. The cash flow from the business pays the mortgage on the building, which increases in value over time. Such buildings are often held by a separate real estate holding entity that may be owned or controlled by owner individuals and may be leased back to the operating company. The building owners may be able to avail of the accelerated depreciation of the building (creating a phantom loss for tax purposes) and, thus, offset some or all of their personal income tax liability. Remember, depreciation is a deductible business expense, but nobody ever writes a check to pay for it!

Back in the late 1980s, I was executive vice president of a real estate syndication firm whose portfolio included thousands of apartments and dozens of shopping centers (in eight states), which were owned by more than 100 limited partnerships. These financial instruments were sophisticated, regulated securities that offered higher-income investors tax shelters of up to as much as a five-to-one write off for every dollar they invested.

This was accomplished largely by apportioning the accelerated depreciation (which resulted in an on-paper income loss) from the limited partnership's owned real estate. Thus, a doctor with a



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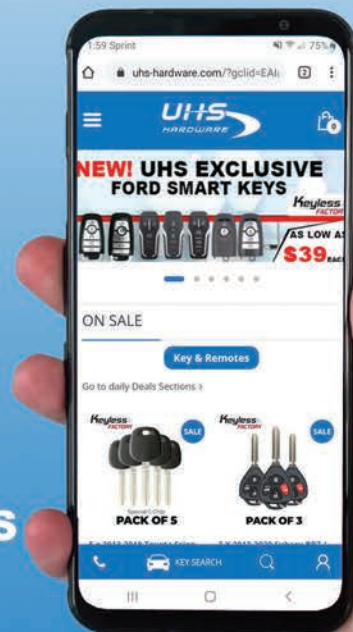
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high income could use his/her share of the loss from one or more limited partnerships to reduce or entirely offset their personal income tax liability.

Indeed, it was not uncommon for some wealthy investors to actually receive a check from the IRS, whereas they would have otherwise had a personal income tax liability of several hundred thousand dollars for that tax year. This may be too much information, but the point is that investors have been using accelerated depreciation of real estate as a legal income tax shelter mechanism for decades. Although some of the laws and tax regulations have changed over time, if you own a building, you can use the same fundamental method.

How to Enhance the Perceived Value of Your Business

Reflecting on the more than a dozen articles in the “Tools for Managing Your Business” series, there have been numerous suggestions and techniques about how to make your business successful. Although the term “successful” is often narrowly interpreted to mean profitable, that’s a one-dimensional description. A business should be profitable and have positive cash flow, but a solid infrastructure can offer the owner more time for quality-of-life endeavors and make the business appealing to a prospective buyer.

Sure, sometimes businesses have been purchased despite their poor financial performance — or even because of it. Very profitable companies with strong cash positions sometimes purchase unsuccessful firms primarily for their NOLs (net operating losses). The underperforming company’s NOL can be carried forward to reduce or offset the acquiring company’s current and future taxable income liability. Although this subject is far beyond the scope of our article,

“One common exit strategy is to use the profits from your business to fund your personal retirement investments.”

this concept is germane to exit strategies and understanding a particular type of buyer’s motivation.

Competitive, strategic and tax considerations can and do form compelling rationales for acquisition and sometimes merger. But, generally speaking, it can be risky to overly depend on such fortuitous opportunities as your exclusive exit strategy. Remember, you also want to get the best possible price, terms and timing, if/when you sell your business. Ideally, position your business so it appeals to a broad range of potential buyers.

Think about a particular business that might be an attractive acquisition for your own business. Assuming that you had an opportunity to buy it, what would make it more appealing (other than price)? Ideally, it would have a steady cadre of established and successful clients/accounts that are growing and punctually pay their bills, with none representing more than 10 to 15 percent of your total sales volume.

But as a prospective buyer (even more so, as a passive investor), you’d also prefer an established entity with solid organizational structure, experienced and professional staff, appropriate tools and equipment and in-place procedures, processes

and best practices. In other words, a business that is reasonably autonomous and did not require extensive reconfiguration, investment, handholding and micromanagement. With all this in mind, let’s do some reverse engineering.

Make your own list of desirable acquisition attributes and then see whether your existing business would pass such a sniff test. Now do it again, but this time, remove yourself from the equation. Without you, does your business resemble the scene from *The Wizard of Oz* when the curtain was pulled back to reveal the true identity of the wizard? Can your business withstand the kind of scrutiny anticipated from a potential buyer’s due diligence?

If we cut through the BS, one good indicator is if you’re able to take an occasional day off without manning the crisis hotline every minute. Be honest: Can you *really* take one or a few days off and have the business run without you? No, it does not have to run *as well* without you. But does your absence cause a disaster? If so, what does this suggest about the value of your business if/when you aren’t present? No, cloning is not yet a solution, and in your case, society at large might object to a second you! Do your employees welcome and even pray for you to take a day off?

What’s My Business Worth?

There are many books about how to estimate your business’s value. But, ultimately, any business or asset is only worth what a buyer is prepared to pay for it when not under duress to conduct the transaction. This article does not attempt to suggest formulas or other methods of determining the value of your business. But let’s take a look at real-world factors that influence the relative value.

Yes, you can consider the hard assets that the business owns (inventory, tools, equipment, vehicles, buildings, etc.), and

it's easier to estimate the value of this part. Beyond that, there are many variables that tend to influence the perceived value. Profitability and cash flow are among the most important elements of value. You can chat about buyers and value with a business broker in your area, but remember: They are motivated to complete a sale and thus collect their commission, which is typically 10% of selling price.

Far too often, business owners convince themselves (even without the aid of marijuana, opioids or liquor), that their business is worth some astronomically high value. With that in mind, this is probably a good time to reveal that the Easter Bunny is not real! Go ahead and take a reflective moment before moving on.

I've played key roles in both large and small company acquisitions, and my experience has been that standard formulas (which can be somewhat useful) are often *not* the driving force in establishing purchase price. In the real world, we need to think about who the buyers are and why they are interested in buying the business.

Are they planning to merge or absorb your business into their existing company? Is the buyer a passive investor looking to be an absentee owner and expecting the business to essentially run itself? Of course, a primary determining factor of price is why the company is "on the block." Who initiated the discussion and why? How many potential qualified buyers are there?

There are always at least two prices: cash and terms. If you're expecting to receive a check with full payment and just walk away, you will no doubt receive a relatively lower price for your business. You will also likely face some tax consequences associated with a sudden and large slug (lump sum) of income for that particular income tax year. Needless to say, requiring a cash deal will also severely narrow your population of potential buyers.

Of course, in a cash sale, you won't have to strap on the risk associated with getting paid in the future, and this risk is very real.

Once upon a time, a small business owner asked my opinion regarding the offered price of an unsolicited cash offer for her successful business. Upon considering all of the known elements, my recommendation was to accept the price.

The seller did the deal but initially felt they received less than a fair price for the business. However, when the new buyer/owner subsequently drove the business into the ground in less than one year and had the state chasing them for sales taxes, suddenly that lower cash price didn't look so bad after all! Strange things can happen.

Payment terms almost always result in a higher price than an all-cash deal but definitely carry greater risk. But if your buyer company fails or files bankruptcy, your chances of getting paid any balance due could evaporate or greatly diminish. You can possibly negotiate a hybrid model with a substantial down payment and the balance financed over typically three, five or seven years.

Other Terms and Conditions

Sometimes, transaction terms include the seller remaining available (or actively on the payroll as a consultant) for a transitional period.

Some types of deals are structured so that the ultimate sale price is somewhat dependent on the performance of the business after the sale. This is known as an "earn out." The idea is to mitigate the possibility of the business falling apart (possibly because of primary customer accounts being lost) shortly after the sale. Such arrangements provide a smoother transition while the new ownership takes control. Unless there are binding contracts for continued work with customers,

what assurances does a buyer really have that these customers will remain loyal? Probably none!

Buyer's Due Diligence

Although this article is about exit strategies, you might one day find yourself in the role of a buyer. Or, part of your exit strategy could include a merger as an interim step or end game.

Under such scenarios, you'll probably have a vested interest in learning as much as possible about your intended seller or partner firm. Indeed, part of your exit strategy may be to look at acquisition candidates to hone your skills in this area long before you're expecting to sell your business.

You can expect to sign an NDA (non-disclosure agreement) in which you pledge to protect confidential information about the seller company that is disclosed during your due diligence process as prospective buyer. Some companies (more than you might suspect) do this as a guise for competitive market research. I leave it to you to sort out the ethical issues!

You might not know the Latin phrase *caveat emptor*, but you are likely to be familiar with the English translation: "buyer beware." Perhaps nowhere is this concept more important than in a potential buyer's due diligence process.

Due diligence means the research, inspection and assessment process that a buyer engages in prior to a purchase. Some would call it "kicking the tires," "looking under the hood" or "doing your homework."

Take the example from one of my past lives where I was asked to help a buyer structure an offer to acquire a well known, branded, 100-plus-year-old consumer products manufacturer. The buyer was an experienced and a savvy businessman but had never been directly involved

in acquiring a business without the assistance of a professional team.

In short, my contribution was successful, the lawyers drafted the agreement and the deal was done. The buyer was very familiar with the acquired company but nonetheless engaged in some appropriate due diligence prior to the sale. Some of this relied heavily on a few individuals employed by the acquired company who were going to become members of the new owner's management team.

However, after the sale, the buyer learned that virtually all of the materials used in his manufacturing process were on the company's books at seriously understated costs. Apparently, the company's accounting standard cost information had not been updated, and gross margins were seriously inflated.

Conclusion

As you think about an exit strategy, here are some considerations:

- It's never too soon to begin identifying your options and engaging in exit planning.
- Even if your plan is sound, you may not be in complete control of your destiny.
- Contemplate buying insurance as a method of protecting those who depend on you.
- If the business includes a building, evaluate buying it personally and leasing it back to the business.
- Identify ways to reduce your business tax liability while funding your retirement plan.
- Decide how much your retirement should depend on the successful and timely sale of your business.
- Inject yourself with frequent doses of reality truth serum when it comes to estimating the probable real-world value of your business.

“Although there's no such thing as a free lunch, when you're sufficiently profitable, you can reduce your tax liability and protect your business and loved ones at the same time.”

- Don't be a neophyte when it comes to buying and selling a business. Educate yourself and ideally get some experience before you try to sell your business
- No, I was not kidding when I said that the Easter Bunny is not real!

As you consider each of the items in this list, ask yourself what the common thread is that runs through all of them. Certainly, one obvious and inescapable observation is that under virtually any scenario, a truly successful business provides more viable options for your eventual exit. Moreover, a well-run company (one with a solid infrastructure that's not overly dependent on you) will enhance the appeal and perceived value of your business to just about any potential buyer.

If you prefer to be less dependent on selling your business as your main exit strategy, you may be more comfortable paying yourself a higher level of compensation and using that to fund your personal retirement plan savings. This would help build a more protective barrier between

your business and personal retirement savings while deferring taxes until later on — when you will likely be subject to lower income tax rates.

Keep in mind that you don't have to fully embrace either end of the spectrum for your exit strategy. You may prefer to hedge your reliance on the successful sale of your business by building a personal retirement investment account such as a 401(k) or IRA. These approaches are not mutually exclusive.

Hopefully, at least some of the information in this article has been informative and useful. Think about what's important to you and how that might change as you get older and approach retirement. Don't get hung up on doomsday scenarios, but consider that you may not always be able to call the shots in your business or personal life. Good health must not be taken for granted. Leave room for a safety net to help protect those who depend on you and erect a firewall between your business and retirement savings account.

The next topic in this series is “Managing Your Sales Force,” where we will discuss how to build, organize and direct your sales team. Incidentally, members requested this topic in a recent survey. ☺



Noel Flynn is a degreed business management consultant with global senior leadership experience, including more than 20 years in manufacturing, wholesale distribution and consulting sectors of the security industry. Noel has been a senior executive, officer, board director and adviser to not-for-profit and for-profit companies in numerous industries worldwide. This includes being an ALOA SPAI board member since 2011, and he is also an ACE instructor, developing and teaching business management. Contact him at nflynn@aloea.org.



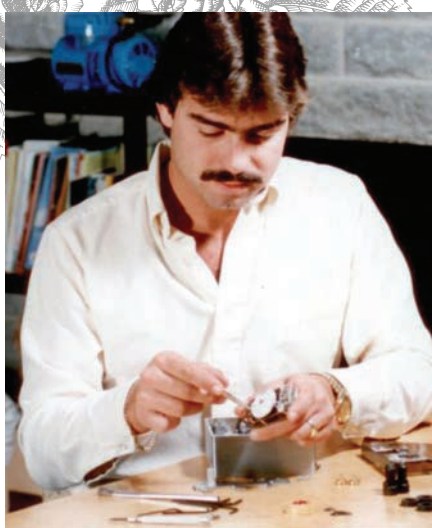
In Memory of **Mark Miller**

Scott Said of Lockmasters pays tribute to this industry legend.

ON SEPTEMBER 21, 2020, THE SECURITY INDUSTRY LOST ONE OF THE great ones, Mark C. Miller. He was born on January 30, 1963, in Rochester, NY, but Nicholasville, KY, was his home for the last 45 years. As a fourth-generation safe technician, Mark grew up in the security industry. He worked at Sargent & Greenleaf and LA GARD before beginning his 34-year career at Lockmasters. Mark became president in 1998 and the owner and CEO of Lockmasters Inc. in 2005. He was the third-generation owner of Lockmasters, which was founded by his grandfather, Harry C. Miller, in 1955.



Mark C. Miller, owner and CEO of Lockmasters Inc., passed away September 21.



Mark worked at Sargent & Greenleaf and LA GARD before beginning his 34-year career at Lockmasters.



Mark and the Lockmasters team held an LSI open house during the 2019 SAFETECH Convention.

Mark was an accomplished technician in his own right. He was one of the first Certified Professional Safe Technicians, a SAVTA Hall of Fame inductee and a Philadelphia Award recipient. Mark prided himself on promoting the industry through education, product innovation, salesmanship and giving back to his employees and community.

Lockmasters founded SAVTA in 1986 and donated it to ALOA in 1993, but Mark still wanted to contribute. He established the Friends of SAVTA Live Auction, which he personally hosted every

year through 2019. His efforts helped raise over \$500,000 for education. If you ever attended the auction, you witnessed his fun-loving and giving nature. The last year he hosted the auction, he happily matched all other SAVTA members' donations. Anyone who knew Mark was never surprised by his generous nature.

Dedicated to Education and Innovation

Mark knew the importance of continuing education. Early in his career, he traveled the world holding training

courses. So it was no surprise when he purchased Lockmasters Security Institute (LSI) in 2013 from his father and built a beautiful new state-of-the-art training facility. It's a facility like no other in the world and is home to his grandfather's industry-famous lock collection. SAVTA members may remember visiting the LSI open house during the 2019 SAFETECH Convention. Mark continued to add to the collection over the years. During his travels, he never missed an opportunity to check out antique shops or search the internet for unique locks and safes. He took delight in sharing stories of the locks and safes that line the halls of LSI.

Mark was an immense advocate for the security industry. In 2001, during a time of national emergency, Lockmasters and Mark helped developed the first life safety, high-security pedestrian door lock. Today, the second-generation LockOne LKM10K has secured thousands of doors in government and military facilities. The Lockmasters' team is grateful that Mark's legacy will continue as new LockOne models continue to be developed.

There was no better salesman than Mark Miller, and he had a special way of making people feel important — because they were. He enjoyed interacting with customers at tradeshow, on sales calls or in the classroom. He made every event special, no matter how small. He was a “hands-on” guy, whether he was showing a drill rig to a student or setting up safes in a customer's shop. He worked with people when they needed help, because he valued them (*Figure 6*).

The industry knew Mark as an inventor, salesman and successful entrepreneur, while those of us lucky enough to have worked with him can reminisce about all the great times we shared with him. He took joy in hosting “over-the-top” employee events and hand delivering



Mark enjoyed interacting with customers at tradeshows, on sales calls or in the classroom.



Mark was a “hands-on” guy with students and customers.



Mark is shown with his wife, Stephanie and two daughters, Madeline and McKenzie.



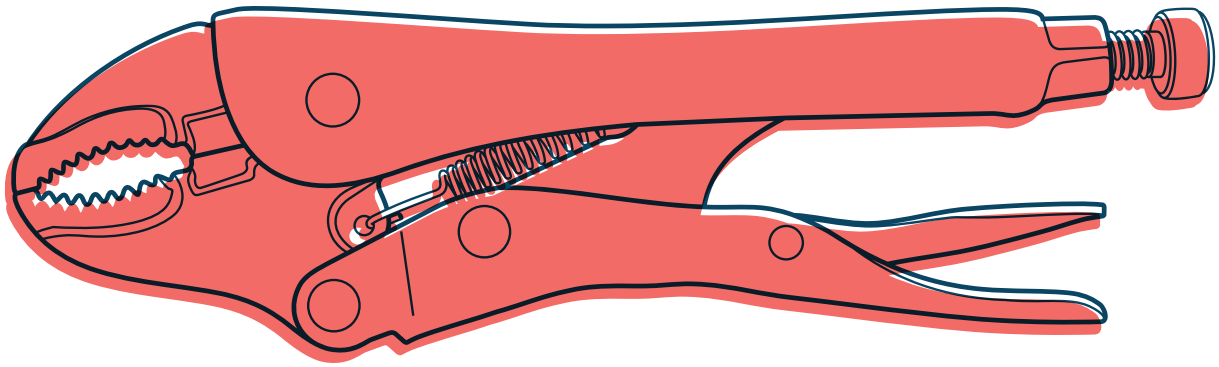
He had a contagious smile and brought light to any room.

commemorative coin sets during the holidays. Mark treated his employees like family, and family was a priority to him. He loved and cherished his wife, Stephanie, and two daughters, Madeline and McKenzie. He was the definition of a girl dad, always showing love and kindness. No matter how busy he was, his family always came first.

The community where he lived will remember him for his overwhelming generosity, especially at Thanksgiving and Christmas. Lockmasters provided 400 Thanksgiving meals to Nicholasville residents and Christmas gifts to over 100 families’ children. This loss will be felt by many.

If you met Mark once, he gave you his

time and attention. If you knew him for a short time, you knew he cared about you and your family. If you were fortunate enough to call him a friend, there was no one better to have in your corner. If you called him husband or father, you were blessed. We will all miss his contagious smile. He brought light to any room, and he will forever be missed. ☹



DEALING WITH A DODGE PROMASTER IGNITION FAILURE

Andrew Taylor walks you
through removal and repair.

I'M GOING TO DISCUSS A DODGE PROMASTER WITH AN IGNITION THAT SUDDENLY WOULDN'T TURN. The interesting part of this truck is that the locks are now on the Fiat SIP22 keyway rather than the familiar Chrysler keyway that we all know and recognize. These ignitions use a set of sidewinder tumblers to work a sidebar.

In this vehicle, enough debris had collected in the ignition that the sidebar would not sit down into the slots to allow it to turn. As it uses an active retainer, you must be able to turn it to the on position to remove it and affect repairs, and there are a few ways to achieve that.

One would be to drill an access hole through the housing to add pressure to the sidebar while the key is inserted. Another method is to cut a fresh blade and add turning pressure with Vise-Grips to force it to turn. I chose that method this time

because I really didn't know the design yet, as shipping issues made the wait time for a replacement cylinder unbearable for the customer. I would have preferred to study a replacement before attempting it, but instead, I was asked to try my luck — and luck was with me, as a couple of snaps with the Vise-Grips got it to turn.

If you can get it to turn one more time, you don't need to remove the column covers because there is an access hole to hit the retainer. But if you do need to bring



Figure 1. The tumbler has a tab that rides in the cuts, and you can see the notch for the sidebar to set into.



Figure 2. The sidebar does not have exposed springs behind tabs like most sidebar designs; it's not an easy part to remove.



Figure 3. Vise-Grips are used on a freshly cut blade to force the ignition over without damaging the original key.



Figure 4. The author is accessing the active retainer after the covers are removed.



Figure 5. The blue circle points out the access hole for the retainer when the covers are still in place.



Figure 6. Using an Allen wrench, the author is removing the first of four screws holding the lower column cover in place.



Figure 7. The third and fourth screws for the lower cover are further down, but still reachable.



Figure 8. This photo shows one of the two screws for the upper column covers near the steering wheel.



Figure 9. The third screw for the upper column cover is in the lower right corner, keeping it from sliding off.



Figure 10. The angle of your drill shot is at the red arrow (it's not an easy shot with the dashboard in the way). Here is where the sidebar sits.

the drill, you'll find a total of seven screws holding the covers in place. The first two for the lower cover are fairly easy to reach with an Allen wrench, but the second two are much further down the column and awkward to reach because of a shelf that runs under the column. Once that's out of the way, you'll find the first two screws for the upper cover close to the steering wheel and the last one in the lower right corner, all from underneath.

Once you have the covers out of the way, you can locate your drill point to create that access hole. On the side away from the retainer, at right angle to the keyway, you want to drill a small hole $\frac{3}{4}$ " back from the face of the lock. Remember that you'll be drilling through two layers of metal before you reach the sidebar, so you want to pay attention to the "feel" of the drill as it cuts through each layer. You want to access the sidebar, not drill through it! If you aren't comfortable with the drill, you might want to stick to the method I used.



Figure 11. This is the spring-loaded bar behind the chrome ring that must be pushed to allow the core to turn to the left.



Figure 12. In the red circle, you can see the slide piece that has a point that must line up with a slot in the casing to remove the core.

Repairs After Removal

Once you have the cylinder out, repair gets interesting — it's not a simple lock to disassemble. After removing the clip on the back side of the cylinder, you have to turn the core to the left toward an invisible accessory position, which is blocked by a spring-loaded bar. To push this bar, you have to pop off the chrome ring around the face.

Once turned in the right position, a point on this slide piece in the rear of the core can line up with the slot in the casing... but wait, there's more! That slide piece gets extended by the tip of the key you are using to turn the lock, so it's blocked from coming out anyway. You have to turn the core without the tip of the key pushing on that slide piece!

My solution was to cut $\frac{1}{4}$ " off the tip of the key so it could line up the tumblers for the sidebar without moving that slide piece. That made it a bit of work to insert the key, as the tip needed a high cut.

But the other option of picking it with my Lishi while holding pressure on the sidebar and moving the spring-loaded bar I mentioned earlier all at the same time seemed quite difficult.

After disassembly, you can finally service this beast and clean out the debris. As you can see by the pictures, the sidebar is actually loaded from inside the cylinder, unlike most other designs, so you have to remove the face to remove the sidebar. Certainly something to avoid!

It's easy to see that the designers of this lock had no plans for servicing in the field other than directly replacing. If you try to order a replacement, you'll find it only as a set that includes matching door locks because they had no plans on you ever rekeying this thing. Of course, determination can see the job through. 🧐



Andrew Taylor, 57, has been locksmithing since 1983 and self employed since 1989. He originally apprenticed under Tom Sprouse in New Jersey and is the owner of Taylor Locksmith in Virginia Beach. He does commercial, residential and automotive work but prefers automotive for the variety.



SERVICING AND REPLACING AN IGNITION LOCK ON A CLASSIC CORVETTE

Sal Dulcamaro walks you through
this job where the car has a tilt and
telescopic steering column.

ALTHOUGH I SPENT THE LAST SIX YEARS AS AN INSTITUTIONAL LOCKSMITH, I started out as a commercial locksmith in the mid-1970s. I started as a one-man shop, worked with my brother for a few years and then went back to being a one-man shop again. I did a bit of everything: residential, commercial and automotive locksmithing. I dabbled a bit in safe work, but mostly just safe lock combination changes rather than safe lockouts. I did quite a bit of automotive lock work ranging from lockouts to fitting keys and various lock-related repairs.

Automotive locksmithing has changed dramatically through the years. In the early 1990s, many cars started to have electronic ignition locking systems that involved transponder keys that required programming — often with specialized and expensive equipment. Many of my fellow locksmiths at the time decided to sell or dump most of their automotive locksmithing tools and parts and get out of that segment.

I saw that trend but decided to stick with working on auto locks on the premise that many older-generation used cars were still on the road and needed keys fit and other services. I didn't do a high enough volume of auto lock work to make it worth investing in all the new equipment and products to service all or most auto lock tasks.

As the years passed, more and more new cars required key programming, and fewer cars with old lock technology remained on the road. My level of involvement in auto locksmithing diminished. The investment required to stay deep in auto

locksmithing became very expensive, and there was a trend for locksmiths who worked solo to either become automotive locksmith specialists or to stick with just residential, commercial and maybe safe lock work.

In the new millennium, I started turning down most auto lock service calls and referred them to the automotive specialist locksmiths I knew.

I invested in a few serious auto lock reference guides that identified what kind of locking system applied to specific makes and models of cars. I'd look up any car that a potential customer needed serviced to see if I could work on it with my old-school tools and equipment. If I heard it was a car from the 1960s or 1970s, I didn't even have to think twice. Year by year, I worked on fewer cars.



Figure 1. A 1975 Corvette has a tilt and telescopic steering column.



Figure 2. The horn pad for the Corvette has already been removed.



Figure 3. A closer view of the horn pad also shows the locking lever that releases the column to telescope downward or upward.



Figure 4. The horn contact is lifted off the steering wheel.



Figure 5. The locking lever is attached to the "star" screw by two small screws.

I did have one customer (you could call him a commercial customer) who ran a custom Corvette restoration company. He restored Corvettes, and in many cases, he needed work done on the car locks. That was one of my few consistent avenues of auto locksmithing. I still occasionally got calls from him after I became an institutional locksmith.

Servicing a 1970s Corvette

I'm going to show the servicing and replacement of an ignition lock for a 1970s

Corvette. A 1975 Corvette (see *Figure 1*) is a General Motors car with a tilt and telescopic steering column. Many GM cars had tilt steering columns, but the tilt and telescopic column was primarily limited to more deluxe models such as Corvettes and various models of Cadillac. This style of tilt/telescopic steering column was not uncommon on other high-end GM cars from 1969 into the 1980s when the first GM steering column ignition locks were introduced.

The horn pad for the Corvette has

already been removed in *Figure 2*, exposing the screws that hold the upper horn contact in place. A much closer view (*Figure 3*) shows it in better detail along with the locking lever that releases the column to telescope downward or upward. After the three screws are loosened and removed, the horn contact can be lifted off the steering wheel (*Figure 4*).

The locking lever is attached to the "star" screw (*Figure 5*) by two small screws opposite each other. Moving the locking



Figure 6. The locking lever is in the locked position.



Figure 7. The author made scribe marks where the two screws were previously to ensure all was returned to the same position upon reassembly.



Figure 8. The combination of star screw, telescoping lock lever and spacer is lifted off as a group.

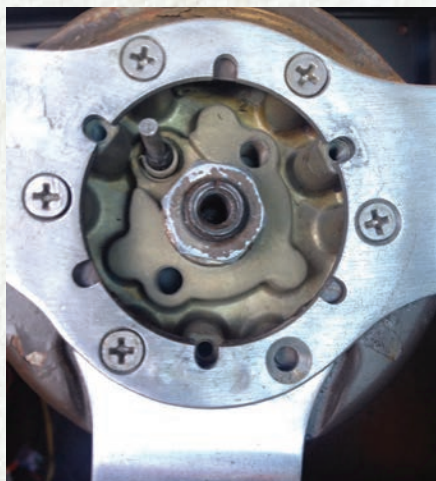


Figure 9. There is a nut holding the steering wheel on the column.



Figure 10. The author used a $\frac{9}{16}$ " socket to loosen the steering wheel nut.



Figure 11. The steering wheel nut is removed.

lever tightens or loosens the star screw, which frees up and allows adjustment of the steering column's telescopic position.

The locking lever, when rotated clockwise, locks the steering column height. If you turn it counterclockwise, you can lift the column upward or push it downward. Once you reach the height you prefer, turn it clockwise to lock it back into place again. It's in the clockwise locked position (*Figure 6*) with one of the two screws removed from the star screw. After the second screw was removed (*Figure 7*), I made scribe marks where the two screws previously were so I

could ensure all was returned to the same position upon reassembly.

After the star screw is loosened, the combination of star screw, telescoping lock lever and spacer is lifted off as a group (*Figure 8*). There is a nut holding the steering wheel on the column (*Figure 9*). I believe I used a $\frac{9}{16}$ " socket (*Figure 10*) to loosen the steering wheel nut. After removing the steering wheel nut (*Figure 11*), I could see the matching scribed marks on the post and the steering wheel to indicate the position for reinstalling the steering wheel.

Pulling the Steering Wheel

The next step is pulling the steering wheel since it's pressed in place and won't just pull off after the nut is removed. Since the star screw was removed, the column height is not secured. It will move up and down to various heights. I used a screw with threads that matched that of the star screw (*Figure 12*). I started the screw into the threaded opening (*Figure 13*) and used an Allen wrench to drive it into the threaded hole (*Figure 14*) until it was deep enough to lock the column in place so it wouldn't telescope up and down.

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Figure 12. The author used a screw with threads that matched that of the star screw.

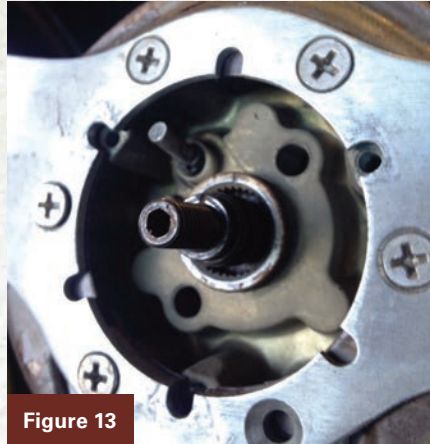


Figure 13

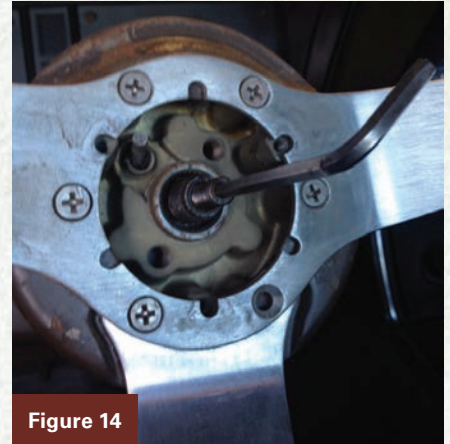


Figure 14

Figures 13 and 14. The author started the screw into the threaded opening (*Figure 13*) and used an Allen wrench to drive it into the threaded hole (*Figure 14*).



Figure 15. The wheel puller is shown.

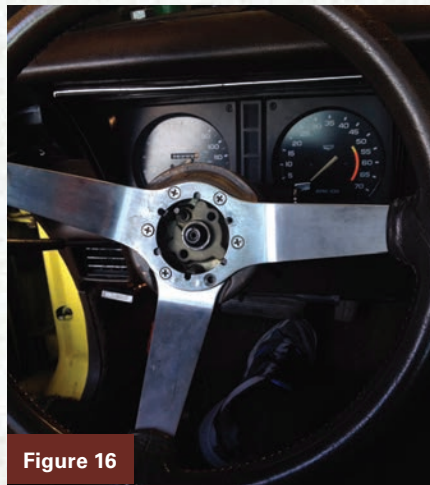


Figure 16



Figure 17

Figures 16 and 17. The steering wheel is still in place (*Figure 16*) but can now be lifted off with relative ease (*Figure 17*).

I attached my wheel puller (*Figure 15*) and tightened the center bolt until it released the steering wheel from its pressed fit. The steering wheel is still in place (*Figure 16*) but can now be lifted off with relative ease (*Figure 17*). The steering wheel is fully off in *Figure 18*, and the spring-loaded locking pin can be seen projected into the locking plate between the 10 and 11 o'clock positions on the locking plate. A straight-on look (*Figure 19*) gives a much more detailed view. That is what locks the steering wheel from turning when the key isn't in use.

The horn contact carrier retainer looked perfectly intact in *Figure 19*, but



Figure 18. The steering wheel is fully off.



Figure 19. A straight-on look gives a much more detailed view of the spring-loaded locking pin.



Figure 20. The horn contact carrier retainer is starting to break apart.



Figure 21

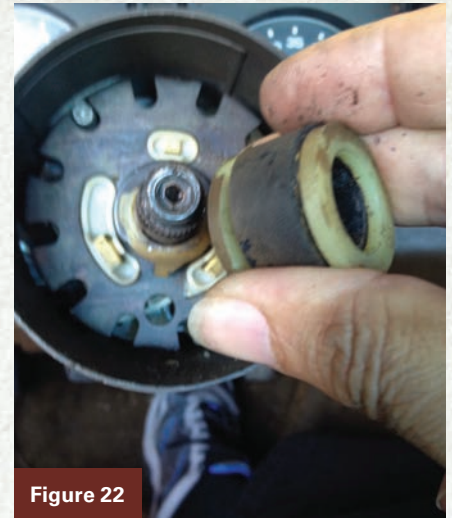


Figure 22

Figures 21 and 22. The author started to lift off the bushing (*Figure 21*) until he had it completely removed (*Figure 22*).



Figure 23. There is a “C” clip that holds the lock plate in place under considerable pressure.



Figure 24. You can’t slide the “C” clip off without assistance from a lock plate compressor.



Figure 25. The lock plate compressor has the lock plate partially compressed.

when I tried to lift it off (*Figure 20*) you can see that it’s starting to break apart.

You’ll see later that I replaced that broken part with a new one. I started to lift off the bushing (*Figure 21*) until I had it completely removed (*Figure 22*). There is a “C” clip that holds the lock plate in place (*Figure 23*), but it’s held under considerable pressure. You can’t just slide the “C”

clip off without assistance from a lock plate compressor (*Figure 24*).

I actually had a more specialized version of a lock plate compressor just for the tilt/telescopic columns. I was able to use this one because I tightened that screw in place of the star screw to hold the telescopic column firm without moving up and down uncontrollably. My other

lock plate compressor had a screw with the matching threads of the star screw to lock the column in place while compressing the lock plate. Since I already had a screw securing the column, I didn’t have to be concerned with that.

The lock plate compressor has the lock plate partially compressed in *Figure 25*, but not yet enough to release the “C” clip.



Figure 26. The lock plate was compressed enough to allow the “C” clip to slide out of position.



Figure 27. The author removed the “C” clip.



Figure 28. The lock plate is removed.



Figure 29. The turn signal switch is preventing access to the ignition lock.



Figure 30. The author removed the screw to the turn signal lever.



Figure 31. A magnetic grabber tool is shown.

After a few more turns deeper, the lock plate was compressed enough to allow the “C” clip to slide out of position (Figure 26). I was then able to remove the “C” clip (Figure 27).

After loosening the nut on the lock plate compressor, I could relieve the tension on the lock plate and removed the lock plate compressor from the threaded shaft of the steering column. With that tool removed, I was able to remove the lock plate (Figure 28).

The turn signal switch (Figure 29) was then the only thing directly in my path preventing access to the ignition lock. Depending on the version you are

working on, you may have a few different levers attached to the turn signal switch assembly (Figure 29). I removed the screw to the turn signal lever (Figure 30). Other than those possible screws, there are three screws that hold the turn signal switch in place. I often use a magnetic grabber tool (Figure 31) to avoid dropping screws down the steering column as I remove them.

I started to loosen one of those three screws (Figure 32), and after it was loose enough, I used the magnet to pull the screw out without dropping it (Figure 33). You can see that the magnet holds the screw rather securely (Figure 34).



Figure 32. The author started to loosen one of the three screws.



Figure 33. The author used the magnet to pull the screw out without dropping it.



Figure 34. The magnet holds the screw securely.

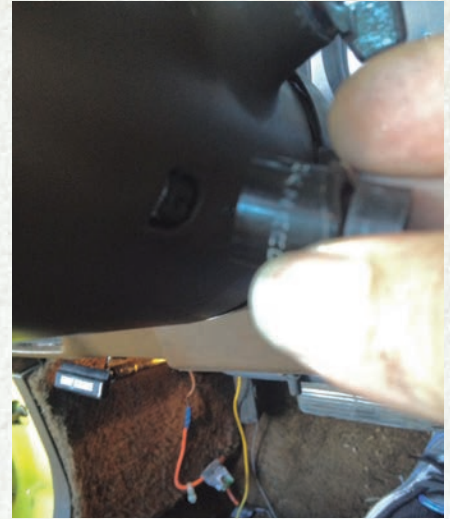


Figure 35. The emergency flasher switch is slightly below the ignition switch.



Figure 36



Figure 37

Figures 36 and 37. With all screws removed, you can pull out the turn signal switch (Figure 36) to expose access to the ignition lock (Figure 37).



Figure 38. An angled hook tool is grabbing part of the key warning buzzer switch.

The emergency flasher switch (Figure 35) is slightly below the ignition switch. I loosened the screw and started to remove the part.

With all screws removed, you can pull out the turn signal switch (Figure 36) to expose access to the ignition lock (Figure 37). There is a key warning buzzer switch located in a slot under the ignition lock, and I have an angled hook tool grabbing part of it to pull it out in Figure 38. A closer view of it with it removed from that

slot (Figure 39) shows where I hooked it to pull it out.

There is a spring-loaded tab on the ignition lock that holds it in place in the column. There is a slot in line with the lock toward its back end (Figure 40). A later version of the lock had a screw retainer. This column is actually equipped to accept that style of lock. There is an empty screw hole just above the screw roughly in the middle of the photo and just below the lock itself. There is probably a special

narrow-tipped tool for compressing the spring-loaded tab, but many years ago, I just took a grinder to the shaft of a slotted screwdriver to make it narrow enough to fit into the slot (Figure 41). A piece of spring steel might accomplish the same task if you applied sufficient pressure to compress the tab. In Figure 42, I'm using my tool to press the tab to release the ignition lock. Pull outward on the ignition lock while you're compressing the retainer until it releases and comes out.



Figure 39. This image provides a closer look at the key warning buzzer switch.



Figure 40. There is a slot in line with the lock toward the back end of the spring-loaded tab.



Figure 41. The author used a grinder on the shaft of a slotted screwdriver to make it narrow enough to fit into the slot.



Figure 42. The author is using his tool to press the tab to release the ignition lock.



Figure 43. The old lock is shown.

The Lock Is Released

The old lock is shown in *Figure 43*. You can see the retainer tab toward the tail end of the lock and the code number stamped on the circumference of the lock. I don't recall if the lock was just bad and had to be replaced or if the customer just wanted it to work on a different key. The new replacement lock (*Figure 44*) is ready to be installed in its place.

That style of ignition lock just snaps back into place. Slide it into the opening where the old lock was and the retainer will catch into the slot that I pressed inward with my tool to release the old lock initially.

The key warning buzzer switch goes back next. There is a small plastic part toward the back of the ignition lock that protrudes when you insert your key. That's what engages the buzzer switch and creates the alert that you left your key in the ignition. You pretty much reverse the disassembly procedure and to put everything back. The turn signal assembly has to be repositioned and the screws reattached. The warning buzzer switch goes back and then the various lever arms, if they were removed.

The lock plate goes back over the top of the turn signal switch, and the lock plate compressor is reattached to compress the lock plate far enough to allow the "C" clip to go back in place. Once the "C" clip is fully engaged, the lock plate compressor can be removed.

This is where we deal with the horn contact carrier retainer. If you recall, that part fell apart from being so old. When you have plastic parts that have been in place for more than 30 years, it's not unusual for them to corrode and come apart. Fortunately, my customer was a company that restored Corvettes and carried all kinds of parts. The new part (*Figure 45*) was almost black but otherwise identical to the original white



Figure 44. The new replacement lock is ready to be installed.

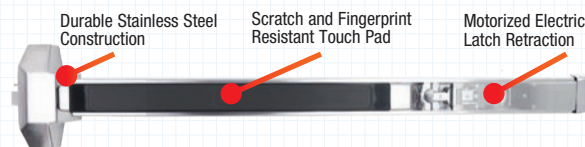


Figure 45. The new part was nearly identical to the original white plastic part.



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Figure 46



Figure 47

Figures 46 and 47. The author lined up the part to the correct position (*Figure 46*) and then placed it over the shaft and the “C” clip (*Figure 47*).



Figure 48. The part snapped into place and fit perfectly.

plastic part. I lined up the part to the correct position (*Figure 46*) and then placed it over the shaft and the “C” clip (*Figure 47*). It snapped into place (*Figure 48*) and fit perfectly.

Finishing Up

After sliding the bushing back in place over the shaft, I reattached the steering wheel, making sure the alignment marks lined up, and then pressed it downward part way. After I pressed the steering wheel as far as I could with hand pressure, I reattached the nut and tightened it down with my ratchet wrench and socket. Once the steering wheel was in place, I removed the screw that I put in the place of the star screw to hold the telescopic column in place.

The last task was to put back the telescopic locking lever and star screw and make sure everything was aligned properly. I had scribe marks so I could place the two screws back in the correct spots in relation to the star screw.

Once it was all attached, I made sure that the locking lever properly released and locked the telescopic column and

**“I ACTUALLY
HAD A MORE
SPECIALIZED
VERSION OF
A LOCK PLATE
COMPRESSOR
JUST FOR THE
TILT/TELESCOPIC
COLUMNS.”**

everything was held in place properly. Finally, I replaced the horn pad and tested it to make sure everything functioned properly.

I did get a few extra horn contact carrier retainers to keep in my tool kit. The next telescopic steering column that I work on wouldn’t necessarily be for someone who had spare parts. When working on older cars, it’s not unusual for the plastic parts to fall apart and require replacement.

Back in the day (when they were relatively new), I’d rarely have to deal with extra parts that were normally functional and intact. If I had worked on a Corvette tilt/telescopic column for a private owner, there’s a good chance I wouldn’t have had the extra parts, as I don’t typically need to replace them with that kind of auto lock job.

Sometimes you can anticipate those kinds of things, but sometimes, you find yourself up a creek without a paddle. Experience can prepare you for unforeseen problems, but sometimes you just have to go with the flow and work out the problem as best you can. ☺



Sal Dulcamaro started in locksmithing in 1975 at age 17. He practiced as a commercial locksmith before becoming an institutional locksmith in 2014 for a large

hospital. He has been a technical writer for more than 30 years, with more than 300 magazine articles published. He previously served as a contributing editor and a technical editor for Reed’s Security Reporter.



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ALOA occasionally makes its members' addresses (excluding phone numbers and email addresses) available to vendors who provide products and services to the industry. If you prefer not to be included in these lists, please check here: ☐

PROFESSIONAL INFORMATION

Please check the description that best describes you (check all that apply)

- | | | |
|--|--|---|
| <input type="checkbox"/> Locksmith Owner | <input type="checkbox"/> Automotive | <input type="checkbox"/> Employee Technician |
| <input type="checkbox"/> Electronic Security | <input type="checkbox"/> Security Professional | <input type="checkbox"/> Mechanical Door Locks & Hardware |
| <input type="checkbox"/> Institutional | <input type="checkbox"/> Safes | <input type="checkbox"/> Investigative |
| <input type="checkbox"/> Other _____ | | |

Are you licensed to perform Locksmith/Access Control work in your state? ☐ Yes ☐ No If Yes, License # _____

Business License # _____ EIN # _____

Any other license held by applicant (Contractors Lic., Low Voltage) _____

Any other states you do business in and licenses held in those states _____

List all phone numbers used by your company/companies: _____

Number of Employees _____ ☐ Store Front Business ☐ Mobile Only

How did you learn locksmithing/access control? _____

How long have you worked in the locksmithing/security industry? _____

ALOA member Sponsor Name/Who introduced you to ALOA?

Sponsor Name (Required) _____ ALOA Number _____ Years known _____

Have you ever been a member of ALOA before? ☐ Yes ☐ No If Yes, when? _____ ID #, if known _____

Are you a member of any local locksmith association? ☐ Yes ☐ No If Yes, name of association: _____

Give the names and phone numbers of two industry-related references:

Name _____ Company _____ Phone Number _____

Name _____ Company _____ Phone Number _____

IMPORTANT: Have you ever been convicted of a felony? ☐ Yes ☐ No If yes, please give details on a separate sheet.

All convictions are reported to the Advisory Committee for review.

A routine background check is performed on all new applicants, unless you live in a State in which passing a background check is a part of the licensing requirements. Non-US citizen background checks are required. If you live in a country that does not allow third party background checks, you will be required to submit an authentic report upon request (no copies/duplicates allowed) before final membership approval can be granted. A copy of your business permit/license, license number, business card, company letterhead or suitable proof of employment in the locksmith/access control business must accompany application.

TYPES OF MEMBERSHIP AND REQUIREMENTS

Check only one box from the categories listed below:

Active Membership

Persons actively engaged in the locksmith/access control industry for a minimum of two years and have achieved one of ALOA's recognized program designations.

- | | | | |
|--|-------|--|-------|
| <input type="checkbox"/> US and US Territories | \$255 | <input type="checkbox"/> I elect to Go Green | \$230 |
| <input type="checkbox"/> International | \$270 | <input type="checkbox"/> I elect to Go Green | \$200 |

International Association of Investigative Locksmiths Membership

Must be an ALOA Member in order to join the IAIL.

- | | |
|--|------|
| <input type="checkbox"/> US and US Territories | \$55 |
|--|------|

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- | | | | |
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| <input type="checkbox"/> International | \$270 | <input type="checkbox"/> I elect to Go Green | \$200 |

Probationary Membership – No Sponsorship Required

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- | | | | |
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| <input type="checkbox"/> International | \$270 | <input type="checkbox"/> I elect to Go Green | \$200 |

Allied Membership

Persons whose position in the locksmith/access control industry relates to locksmiths, and cannot qualify for any other class of membership.

- | | | | |
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| <input type="checkbox"/> International | \$270 | <input type="checkbox"/> I elect to Go Green | \$200 |

Note: Your application will be processed with a 90 day waiting period.

Any institutional locksmith not using his/her work address must submit a letter from employer stating that you are an institutional locksmith.

DUES AND FEES

An application fee and the appropriate dues must accompany the application in order for processing to begin.

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US and US Territories	\$70
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Australia, Bahamas, Barbados, Belgium, Belize, Bermuda, China, France, Haiti, Philippines, UK	\$210
Israel, Korea, Papua New Guinea, Saudi Arabia, United Arab Emirates	\$360

Applicants from countries not listed must submit background check and report from local Law Enforcement with application.

FINAL CHECKLIST

- | | |
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| <input type="checkbox"/> Required Proof of Employment in Industry | _____ |
| <input type="checkbox"/> Annual Dues Amount | _____ |
| <input type="checkbox"/> Application Fee | _____ |
| Total Amount Due | _____ |

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I understand and consent that in the course of reviewing this application ALOA may review publicly available information for the purpose of verifying the information submitted and do a background check.

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Signature _____ Date Signed _____

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HIGH SECURITY SYSTEMS

Part 2

In this multi-part series, **William M. Lynk, CML, CPS, ICML, CMIL, M.Ed.**, discusses 10 popular systems designed for institutions.

Medeco³

MEDECO HAS A RICH HISTORY IN THE SECURITY FIELD THAT DATES back to the late 1960s. The unique rotating angled pins have helped keep many facilities safe and secure over the decades. The current Medeco M3 is patented until 2021 and offers both excellent key control and high security. Even though the Biaxial bottom pins have only six depths, the angled pins help to allow millions of useable combinations within a single system!

System Overview

Most institutions use a variety of fixed and IC cylinders (see *Figure 26*). This brief list is provided to show how interchangeable cores in general fit into the picture:

- Original Product 3100/3200 ICs – sidebar and rotating bottom pins; BHMA/ANSI A156.5 and A156.30
- Biaxial™ 3100 Series LFIC (Yale Retrofit); not UL437
- Biaxial™ 3200 Series LFIC; UL437; BHMA Grade 1
- Medeco3 3200 Series LFIC; UL437; BHMA Grade 1
- Medeco Hotel Function LFIC; UL437
- Medeco Classic KeyMark and Medeco x4 LFIC; non-UL437; angled keyway to vertical keyway; retrofits LFIC Sargent, CorbinRusswin, Schlage and Yale; standard SFIC pinning
- KeyMark SFIC; non-UL437; angled keyway to vertical keyway; SFIC pinning

Of all the lock manufacturers, none exemplifies “the breaking of paradigms” quite like Medeco. Throughout its history, Medeco’s leadership in the lock manufacturing

arena has been evident to almost everyone. Even the general public sees it today on television via drama series, news specials and movies. With a focus on high security and top-quality products, this “different way of thinking” has elevated Medeco to one of the major high security lock manufacturers in the world.

Medeco is often called “The Father of Retrofitting,” so let’s look at how and why this creative ingenuity has catapulted the company into its illustrious place in history.

This revolutionary concept, first patented in 1985 by Medeco, introduced the system of angled key cuts to fit special chiseled, angled cylinder pins (*Figure 27*). The tumblers are elevated and rotated to find the correct seated position in the key grooves within the chamber. This happens because of the unique cuts on the keys, as well as the special offset tips on the pins.

Note that recent patents are far different from the original patent of the 1960s. It covers both the keys and the cylinders.



Figure 26. The Medeco 3200 LFIC is pictured.

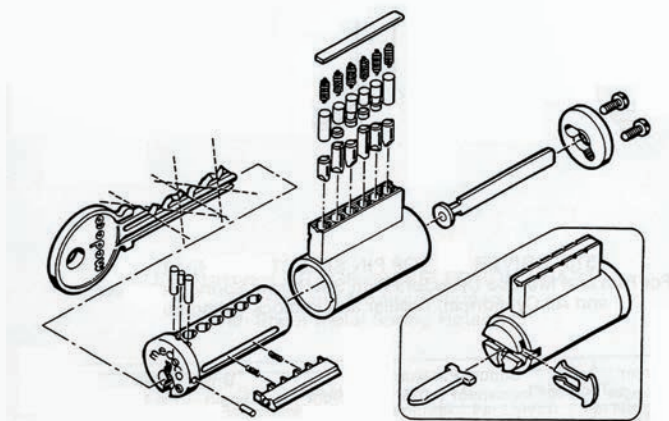


Figure 27. This image provides an exploded view of a Medeco key-in-knob cylinder.

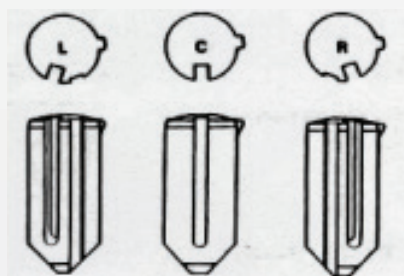


Figure 28. The left, center and right Original Product bottom pin orientations are shown.

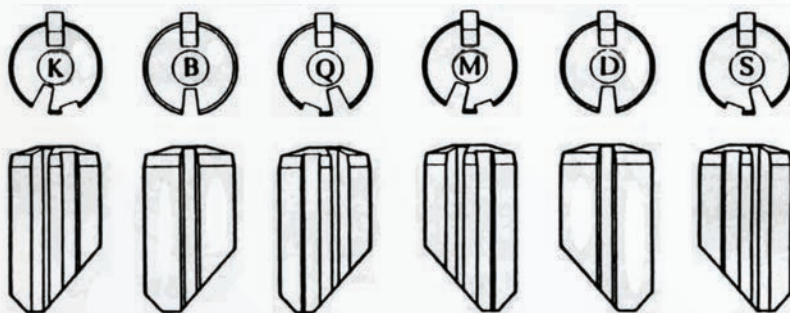


Figure 29. Here, you can see the six orientations of the Biaxial bottom pins.

Cylinder Operating Principles

Medeco locks operate under the principles of a standard pin tumbler. This can be called single-locking action. But a Medeco lock also incorporates a sidebar that protrudes into the shell, thus creating a dual-locking action.

Along one side of the pins is a slot that must align (via rotation by key insertion) with the legs of the sidebar. The chisel-pinned tips of the bottom pins allow them to be rotated by the key as it is inserted into the plug, to be finally seated within the corresponding angle cuts of the key. The bottom pins are not only rotated, but are simultaneously elevated to the correct shear line so the plug is permitted to turn.

With the addition of a slider mechanism in the Medeco3 cylinders, a third locking mechanism has been added. The slider mechanism aligns with the sidebar, based on a key-side milling that is cut at the factory. The exacting tolerances of the Medeco cylinder coupled with the triple-locking action provide a highly pick-resistant lock. Drill-resistant inserts, rods and ball bearings protect both the shear line and the sidebar within the cylinders, making the Medeco locks quite resistant to many common forms of attack.

In addition, Medeco cylinders are also less susceptible to

common wear and tear on the bottom pins. This is because the chiseled tip of the bottom pins never comes in direct contact with the bottom of the key root. The pins rest on the sides of the cut, providing excellent wear resistance. With this consideration in mind, one can see that the wear on the sides of the pins will not affect cylinder operation — a huge contrast to pins in traditional tumbler cylinders.

Technical Data

Original Product Pin Specs

Pictured in *Figure 28* are Original Product bottom pins. With pins of three different angles — combined with six different depths at a .30" increment within a 6-pin cylinder — 34 million theoretical key combinations exist. Notice that the side groove does not run the full length of the pin, as it does in some of the Biaxial pins. Some of the Series 10 pins do, however, run the length of the pin.

Biaxial Pins

The Biaxial pins (*Figure 29*), as well as Original pins, have a diameter of .135", and the bottom pins of both types have a tip

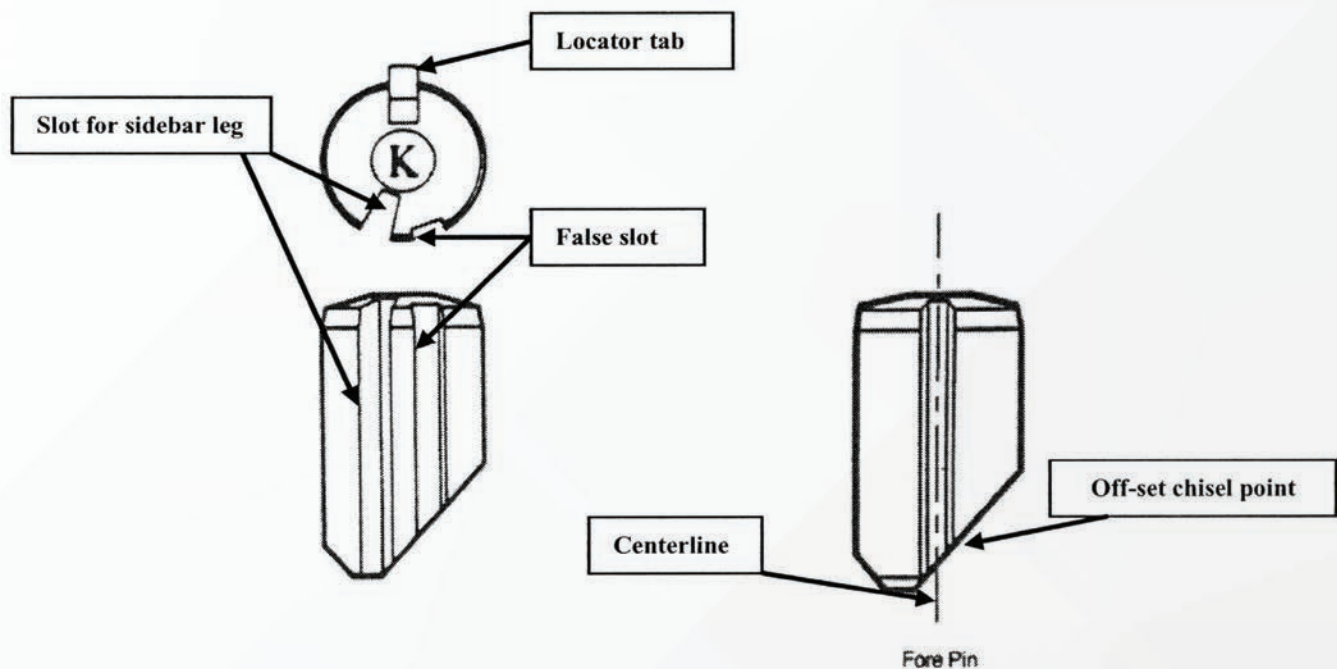


Figure 30. This image shows an analysis of a rotating Medeco Biaxial bottom pin.

angle of 85°. The bottom pins are made from brass with nickel plating, providing additional wear resistance. Silver-colored wafer pins are manufactured from hardened steel and are nickel-plated for rust resistance. The groove located at the top of the bottom pin was designed for pick resistance. Left- and right-angle pins also contain a false slot for pick resistance, though the center pins do not.

At the top of each pin is a locator tab (a tiny protrusion) that is used to limit the pins' rotation in the chamber. It rides in the locator tab slot along the pin chamber wall. They work in unison to limit pin rotation motion from 40° to 50°.

Biaxial Pin Orientations

Within six depth values lie six different pin orientations, or directions. They are:

Left – Front (Fore – FL)	Center = Front (Fore – FC)	Right – Front (Fore – FR)
Left – Back (Aft – AL)	Center – Back (Aft – AC)	Right – Back (Aft – AR)

Those of us who are good sailors recognize the alternate terms used for “front” and “back.” Few, however, know that many a

frigate has sailed to the doors of Medeco delivering raw materials for pins, springs, locks and hardware, thus the adoption of the seafaring terms for its pins.

Take a look at *Figure 30* to see exactly what a Biaxial bottom pin looks like, as well as its parts.

Creation of the Biaxial Bottom Pin Letters

Despite what some may think, Medeco did not arbitrarily create the bottom pin letters, nor are they derived from the first names of the tech department staff members. There was a systematic method to the nomenclature.

Original Product has bottom pins that are oriented three ways:

Left – Center – Right

The engineers took the first letter of each of these orientations to create the basis for the additional orientations made possible by the Biaxial system. Since “fore” means “before” and “aft” means “after,” that is exactly how the letter designations were used. Thus, you have all six of the Biaxial bottom pin orientations.

Some relate it to the 1968 Stanley Kubrick movie *2001: A Space Odyssey* where the computer HAL was one letter away in each position from IBM. (Arthur C. Clarke, co-screenwriter, claimed this was unintentional, and stated that if he

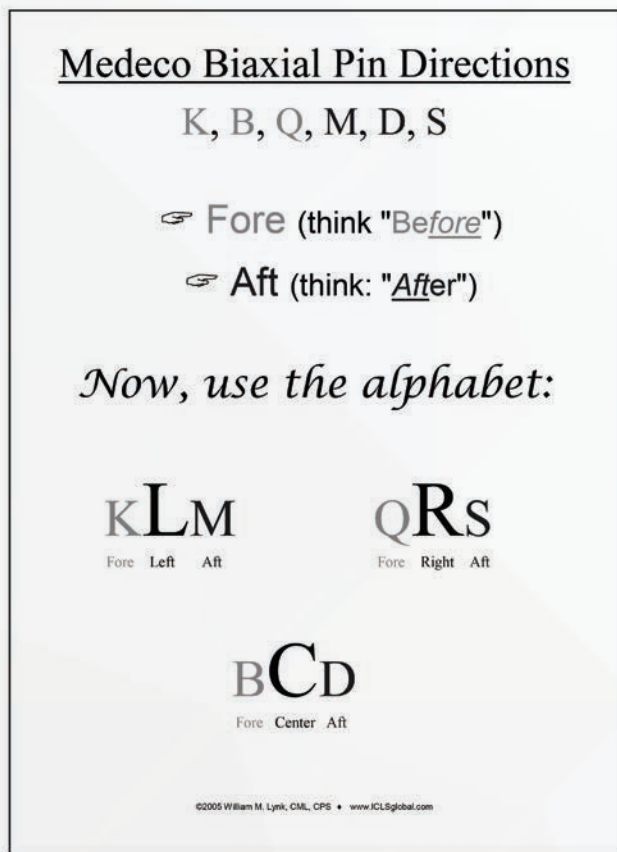


Figure 31. This chart explains the directions (orientations) of the Biaxial bottom pins.



Figure 32. BEST is virtually synonymous with the “small format interchangeable core.”



Figure 33. Pictured is an SFIC key-in-lever lock, one of the many types SFIC hardware that accepts BEST cores.

had noticed it before it was too late, he would have changed it. HAL stands for **H**euristic **A**lgorithmic Computer.) Be that as it may (or may not), the chart in *Figure 31* will help make this clearer.

Keyways and Key Control

There are seven levels of systematic key control offered. They include:

- *Level One:* Commercial keyway — available to locksmiths as a stock keyway.
- *Level Two:* Card-controlled keyway — more controlled access, but still available to locksmiths. Key-cutting capability is only allowed at the distributor level or at Medeco; locksmiths are not permitted to cut keys.
- *Level Three:* Contract controlled; restricted keyways — factory-controlled only.
- *Level Four:* Factory-controlled; Omega keyway — most controlled; no key blanks available and no provisions for making duplicates.
- *Level Five:* Biaxial line — card-controlled and contract-restricted.
- *Level Six:* Biaxial line — end user programs.
- *Level Seven:* Factory-restricted.

Conclusions

What does the future hold for Medeco? With a company as innovative as this, one would expect the future to be astonishingly bright. And it may be. Even in the face of so many mergers, creativity still needs to thrive within a company whose middle name is “Security.”

Pin cylinders that rotate above the plug and change constantly like a lottery spinner? Automotive interchangeable cores... what a market! Only within the walls of Medeco are these kinds of secrets being developed. A wedding of ingenuity and marketability — that’s what Medeco seems to be about. And the future may already be here... behind those closed doors.

BEST Cormax

BEST, the oldest and first interchangeable core company in the world, is virtually synonymous with the “small format interchangeable core,” or SFIC (*Figure 32*). Best Access Systems, now a part of dormakaba, offers several systems that can be considered high security within its expansive hardware line (*Figure 33*). Its standard cores and keys — which include the eight Premium W Series cores, previously patented — by themselves are not high security. The Classic Best Peaks line is currently

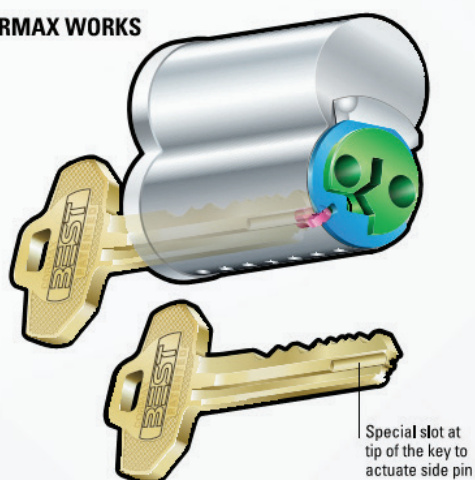


Figure 34. The Cormax core shows the small slider pin at the right back of core.



Figure 35. The Cormax key blank has a cutout at the tip for the slider pin.

HOW CORMAX WORKS



Patented side pin engages slot in core body and sleeve, preventing rotation unless the proper CORMAX key is present.



Patented side pin slides out to disengage from the body and sleeve when the proper CORMAX key is inserted.

Figure 36. This graphic shows how Cormax works.

out of patent, but the blanks have not yet been manufactured aftermarket. However, Cormax (previously MX8) fills the bill.

System Overview

BEST's newest product, Cormax, is under patent and offers exceptional key-control potential. Cormax keyways J, K, L and M can retrofit to cores in those standard keyways (even aftermarket), but because of a thinner milled key blade, the standard keys in those keyways will not fit into or operate a Cormax core of the same keyway. This reverse compatibility feature is similar to various Schlage and Kaba Peaks products on the market.

The operating principle of the Cormax core is based on a small slider pin at the rear of the core (Figure 34) that correlates with a cutout near the tip of the key (Figure 35). There are eight positions for each J through M keyway. There is also

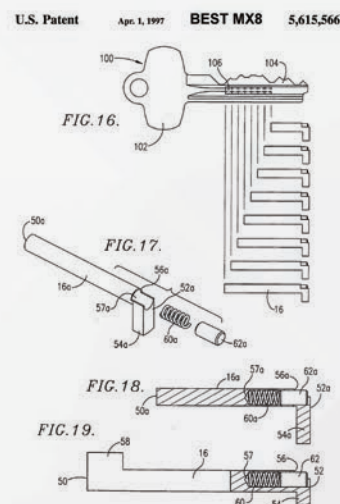


Figure 37. Pictured is the original patent drawing for Cormax when it was MX8.

another set of proprietary keyways that are new and can be obtained based on geography and other factors. They do not retrofit any existing BEST keyways and are milled thicker in blade width (Figure 36).

More specifically, the Cormax System is available in two series of keyways: the M Series and the X Series. Each series offers a different blend of features. For example, Cormax can provide geographic exclusivity to the customer to help maximize convenience while optimizing security. The patent (No. 7,681,425) is valid until May 2027 (Figure 37).

Technical Data

The keyways tell the story of how Cormax might be integrated into your facility, especially if you already have an SFIC system, and they include any of the J, K, L or M keyways.



Figure 38. The BEST 5C core and related housings are shown.



Figure 39. The long blade blanks are shown alongside standard-length SFIC blanks.

M Series Keyway Features

- Patented keys operate both Cormax and Standard BEST cores (backward compatibility) with existing BEST keyway.
- (J, K, L and M only) Standard keys do not operate Cormax cores.
- Available in large-bow, long-blade and long-nose key blanks to work with special applications.
- Available in core designs for use in special application locks, such as high security mortise, hotel cylinders and glass display-case locks.

- Uses the same combining kits and key-cutting equipment as the Standard BEST keyways.
- M Series keys operate Cormax cores and Standard (non-patented) BEST cores. Standard key blanks do not operate Cormax cores.

X Series Keyway Features

- Distinctive key design includes thicker key blanks with larger bow for added strength and easier handling.
- Keyways are unique to Cormax, offering even higher key duplication protection.
- Cormax keyways use the standard combining kit, minimizing the expense of system changeover.
- X Series keys operate Cormax cores only.

Pin Kits and Tools

Cormax was based on an existing patent that was purchased by BEST well into its life. One of the reasons BEST liked this patented concept was that it did not involve having to alter any SFIC housing (a big “no-no” for BEST) for the core to fit in. Housing modification for existing hardware is necessary for products such as Scorpion SFIC, Sargent XC, Arrow Plus, etc. because of the added sidebar and other small security devices.

An additional bonus is that existing BEST pin kits, capping blocks, capping presses and key combiners (punches) could all still be used without modification. And the core could be combined and sealed as with any previous BEST core — a win-win for BEST and its end users.

But, there still exists one type of high security cylinder that could also be used — not new, but an adjunct for many institutional locksmiths. It has been called the “Protected Mortise” by some, or the 1E7J4 Mortise by BEST aficionados in conjunction with the modified 5C core.

BEST High Security Core and Mortise Cylinder

Filling the need for a cylinder that was UL 437 listed, BEST created a special protected mortise cylinder housing and matching core that can withstand quite a brutal attack (*Figure 38*).

Known as 1E7J4, the cylinder is manufactured from a stainless steel casing that’s highly polished and quite strong. The 5C core is not UL 437, is manufactured slightly differently than most small format cores and is recessed into the housing by a little more than ½". The core itself has a cutout on the control lug so it will fit into the special mortise housing. It also has two small recessed indentations on either of

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5C Core - Left Side View

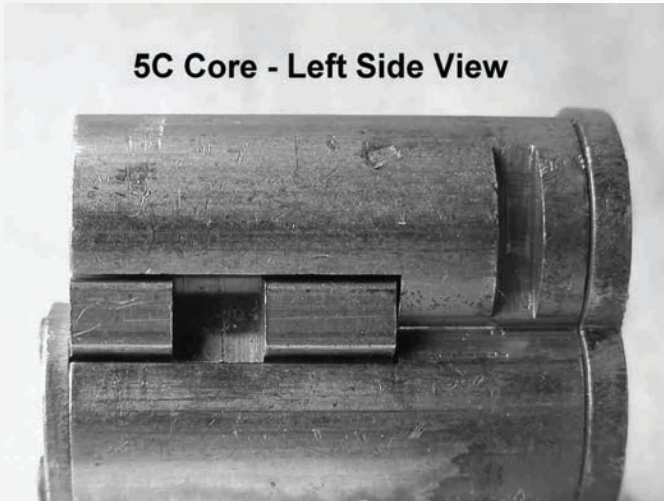
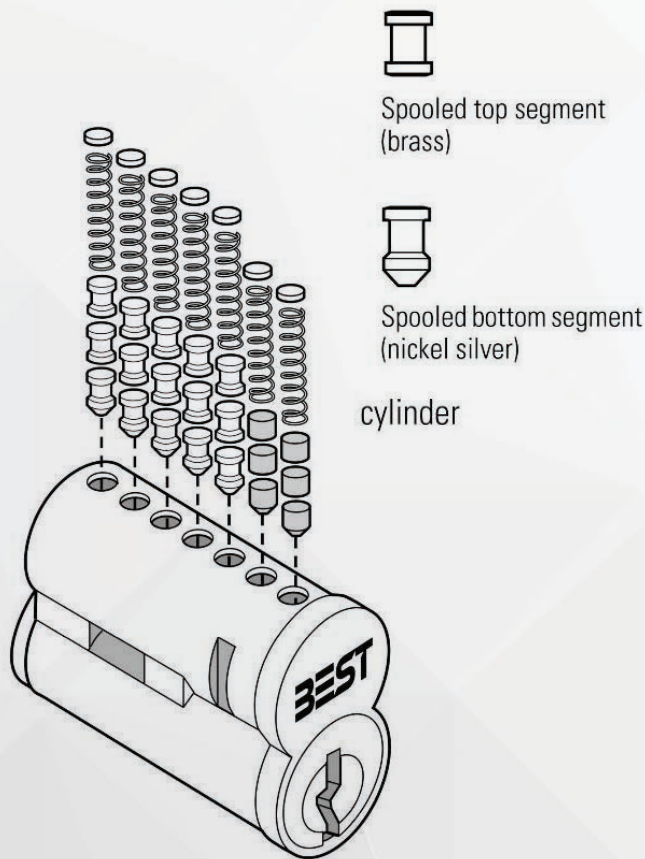


Figure 40. A side view of the 5C core is given.



Loading the 5C core for the 1E7K4 cylinder

Figure 41. The pins used within the 5C core and its housings are shown.

the upper sides of the core near its faceplate. To maintain the UL listing, this core must be combined at the factory.

There's also a large coverlet over the face of the mortise so the core is completely secluded and incognito. The collar is made of stainless steel and specially designed. This is why the $\frac{5}{16}$ " blanks are necessary to completely access the core inside. This was introduced to deter picking attempts (Figure 39).

When the control key operates the core, the core with the special thick coverlet face is removed together. The core can then be extracted by sliding it downward, outside of the mortise collar. The hardware (as a unit) meets UL 437 requirements but is only manufactured for use in mortise locksets (though padlocks were once manufactured for the same special 5C core) (Figure 40). If the locksmith chooses to combine the core at the facility, it will not have the UL 437 listing, as the factory uses special spool pins along with stainless steel pins for increased picking and drilling deterrence. It is then ordered as a 1E7K4 (Figure 41).

Conclusions

Aside from BEST being the creator of the small format interchangeable core over a century ago, the company has shaped its destiny in many ways. Once a company owned by a tight-knit family, following a staunch "end-user-only" distribution method, it is now owned by a major conglomerate and follows the standard distribution format. BEST continues to hold steadfast to the original idea of a superior product that still truly 'interchanges' within its realm though others have veered from that conceptual path. Even though its price point may be substantially higher than most of its competitors, its quality has not been forsaken. Perhaps with no large parades down Main Street USA, we can only guess what the next patent 'event' will be like. Sound the trumpets...it's coming soon. 🎺



William M. Lynk, CML, CPS, M.Ed., has been a locksmith since 1975 and is the owner of www.ICLSglobal.com. Bill is an IC specialist, an industry author, the subject matter expert on IC for ALOA, and an ALOA ACE instructor, teaching classes on interchangeable cores and master keying across the country. He has originated SFIC Technical Manuals for both national and international lock manufacturers, and maintains a working relationship with the major lock and security manufacturers throughout the world. In 2013 and 2015, he was named *Keynotes* Author of the Year.



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The graphic for SAFE TECH 2021 features a stylized sun with rays, a mountain range, and a city skyline with a bridge.

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The Lockdown and the Retrofit

Learn how to remove a concealed vertical rod under a low ceiling without having to take down the door. **By Tony Wiersielis, CPL, CFDI**

LAST NIGHT, I WAS WORKING IN A SCHOOL AT the southern tip of New Jersey, and I came upon what you see in *Figures 1-4*. This device provides a way to secure a door from the inside during a lockdown without going into the hall to do it. *Figures 1 and 2* show how it's mounted when not in use. *Figure 3* shows it deployed, and *Figure 4* provides a close-up view of how it attaches to the wall. Apparently, the end user adjusts that cable clamp for length. This item is sold by no-surrender.com.

I tried this out, and I noticed that the door could open partially. From the inside, I noticed there was a lot of pressure exerted against that eyebolt, and it seemed to me that it might pull out of the wall if you leaned into the door. I don't know if a better installation of the eyebolt would improve security or not.

To me, it was an overly complicated, cumbersome way of securing the door that might be easy to defeat, but I don't have any other experience with it. I converted two doors from cylindrical levers to panic bars. Because there was no lever or knob to hook the loop end of the cable onto, this device was unusable on those doors.

I also noticed the ubiquitous use of those magnet strips you see in schools — the ones that cover the strike so the latch can't go into the hole. For the uninitiated, the lock is often a store-room function, locked all the time. To lock down, the door is opened slightly from the inside and the magnet is slid up or removed so the latch goes into the hole.

I don't know. The natural state of a latch is extended, not compressed, as it is with the door closed and the magnet in place. I wonder if, eventually, the springs behind the latch will fail when they are needed most. If there's a fire and possible panic, will anybody remember to remove the magnet?



Figure 1



Figure 2



Figure 3. The device is deployed.

Figures 1 and 2. You can see how the device is mounted.



Figure 4. This photo provides a close-up view of how it attaches to the wall.



Figure 5



Figure 6

Figures 5 and 6. A number of devices protected the old bars.



Figure 7. The head of the bar was quite narrow.



Figure 8. The screw and finish washer held one half of the outside trim in place.

Another Retrofit

This is another situation where I realized that I could write an article about what I was doing when I was already partway through the process. This one is mostly about a method of removing a concealed vertical rod under a low ceiling without having to take down the door. This is handy to know how to do if you're working alone or don't like removing and replacing doors.

There's also the horrendous chop job the first installer did to the doors and how we covered up the mess. I learned a nifty way of cutting an aluminum push plate in the process as well. Here goes.

We were converting electric concealed vertical rod devices, top rod only, to PHI MLR surface vertical rods, also top latch only. MLR is short for motorized latch retraction, which is much quieter than solenoid operated bars, and it doesn't

require a huge inrush of current to work.

It's been a while, so I don't remember if the old bars were Corbin or Yale. The doors were extremely "busy" and constantly getting hit with beds, gurneys and carts, so there were a number of devices protecting the old bars (*Figures 5 and 6*). The head of the bar was quite narrow (*Figure 7*), and *Figure 8* shows the screw and finish washer that held one half of the outside trim in place. Note from the



Figure 9



Figure 10

Figures 9 and 10. *Figure 9* shows what the author was up against on the inside, and *Figure 10* shows the outside.



Figure 11. Pat is bending the plate at the scored line.

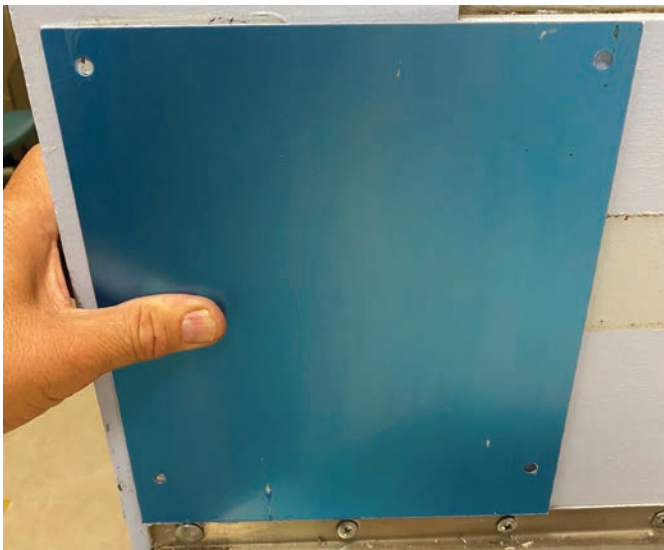


Figure 12. The author is holding the plate and checking for fit.

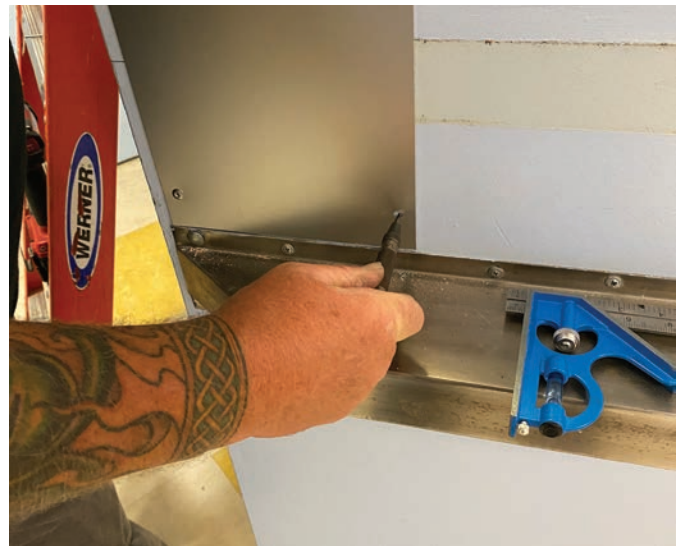


Figure 13. Pat is punching for the holes.

paint lines that this was hidden by the cover on the head of the bar.

Figure 9 shows what we were up against on the inside, and *Figure 10* was the outside. We were kind of screwed until I remembered that I had a stash of really wide aluminum push plates in my truck. The issue was cutting them cleanly. Pat (the guy I was working with) taught me something new that day. Ordinarily, I might use a Dremel to cut one of these, but I'm never happy with the edge. Pat

used a straightedge and multiple passes with a utility knife to score the plate. *Figure 11* shows him bending it at the line; it broke cleanly, requiring a little bit of filing to clean it up. Genius!

Figure 12 shows me holding the plate and checking for fit. Note the top right screw is just below a piece of glass, commonly known as a "light" in a door. That situation tends to give me agitation; glass tends to be unforgiving and dangerous.

It all worked out. In *Figure 13*, Pat is

punching for the holes; we drilled and riveted the plates on, also visible in *Figure 13*. I feel that rivets are cleaner-looking than screws in this instance, and nobody is unscrewing them. If you have a situation in which part of your lock is going to rest on top of a screw on a push plate, rivets don't stick out as much. I might go into detail about rivets and rivet guns in a future article. There are some dos and don'ts about using them that you'll want to know.



Figure 14



Figure 15



Figure 16. The ceiling was close to the top of the door.



Figure 17. The author is pulling the rod assembly up into the ceiling.



Figure 18. The author is using locking pliers to clamp the rod.

Figures 14 and 15 show the finished product on a door with and without the stainless guard. Looks pretty clean to me.

This last pictures show how to get the concealed rod out of the door. Obviously, I did this when we removed the old bars. The ceiling was close to the top of the door (*Figure 16*), and *Figure 17* shows me pulling the rod assembly up into the ceiling. I didn't get far because of some ductwork. You want to be cautious when

you do this; you don't know if some fool left a live wire up there, and you'd rather not get shocked off the ladder. Tip: Use the back of your hand to lift and move ceiling tiles instead of your fingers — no fingerprints.

In *Figure 18*, I'm using locking pliers to clamp the rod as far up as I can get it, and I'm using Pat's Milwaukee 12-volt mini bandsaw to cut it. Note that I'm not holding the pliers; they are resting on top of the door.

Don't let go of the rod while you're pulling it up and reclamping it, because you will sorely regret it if you have to retrieve it from inside the door. I have a DeWalt bandsaw that I use to cut mullions and panic bars and I love it, but it's too big and heavy for this kind of thing. Since I also use 12- and 18-volt Milwaukee tools, I am absolutely buying this soon. It's a joy to use.

I kept pulling the rod up and then ran into a cotter pin that didn't want to come



Figure 19. The author pulled the rod up and ran into a cotter pin that didn't want to come out.



Figure 20. The author used a Milwaukee 3" cutoff tool to remove the cotter pin.



Figure 21. These pieces were left after the rod was cut.



Figure 22. The author had to cover this cleaned-up hole.

out (Figure 19). I used my Milwaukee 3" cutoff tool to remove it (Figure 20). I could have used this tool to cut the rods as well, but it gives off some dust in the cutting process that the bandsaw doesn't. Smoke alarms going off in hospitals is extremely bad karma.

Figure 21 shows the pieces left after I cut the rod into sections. If you don't have either of the tools I used, you can use a hacksaw to do what I did. Not a lot of fun, but it's better than dropping the door.

Something to remember: When you put on a push plate to cover holes or damage, you're also providing a clean, flat surface to install your lock. That being said, you need to be sure that a thin plate is not the only thing you're screwing into. You need to be screwing through or into plate and door for a strong install. Through-bolting is al-

most always stronger than screwing into something, if you can do it.

Last thought: Figure 22 shows a cleaned-up hole I had to cover. The previous installer apparently used a hole saw to drill from one side of the door. It caused a ragged edge on the hole when it came out the other side. The push plate couldn't lie flat on top of it, so I used my cut-off grinder to remove the burrs. You don't want a wavy surface under your hardware. 🌀



Tony Wiersielis, CPL, CFDI, has more than 30 years of experience and has worked in most phases of the trade throughout the New York metropolitan area. He was named *Keynotes* Author of the Year for 2016.

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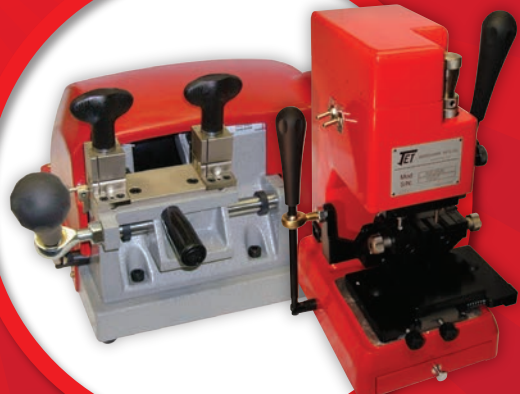
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