

AFD Ep 460 Links and Notes - Car Starters and Ignitions [Bill/Rachel] - Recording Feb 20, 2023

- [Bill] Prior to the invention of the electric car ignition, starting a car was a grueling - and often dangerous - process. A driver had to hand-crank the engine to get it started, and the engine could kick back, breaking a finger or arm. The force of the kick back could be severe enough to maim or even kill. Today we're outlining the history of the electric car ignition, which changed that, and more recent ignition technologies...
- [Rachel] In 1908, Byron Carter, the founder of the Jackson Automobile and Cartercar companies, died of pneumonia as a result of injuries sustained while trying to hand-crank start a car on the Belle Isle Bridge near Detroit. After this accident, Henry M. Leland, the head of Cadillac, sought to invent an electric self-starting ignition device. When Leland and his team of engineers weren't able to develop a device that was small enough to be practical, he reached out to Charles Kettering, who was known for his automotive inventions. Kettering, along with his team at Delco, or Dayton Engineering Laboratories Company had a practical model ready by February 1911.
- Kettering's ignition performed the 3 functions that ignitions still perform in modern cars: 1) engine starter, 2) producing the spark for ignition of the fuel, and 3) source of electric current for lighting and other electronic components. Leland ordered 12,000 ignitions for his 1912 Cadillac models, and Delco transitioned from research and development to production. Soon after, Kettering's electric starter replaced the crank start, and opened up automobile ownership to people who didn't have the strength to start up the previous models, such as women.
- [Bill] Sidenote on Kettering: he was pretty infamous for some of his other inventions. He also invented or helped invent both leaded gasoline and ozone-depleting freon. When he was developing leaded gasoline, he hired a medical expert to proclaim that it was safe for humans. In 1945, he helped to found what would become known as the Memorial Sloan Kettering Cancer Center, a research center that applies the principles of industrial research to cancer research, but his legacy is one of causing cancer as well as treating it. Kettering Health is also a big network of Dayton and Cincinnati area healthcare providers named for Charles Kettering. The Dayton suburb of Kettering is also named for him, and it is where he lived.
 - https://en.wikipedia.org/wiki/Charles_F._Kettering#Belle_Isle_and_self-starter
- [Bill] Another source we looked at was an AAA member magazine article from the Fall/Winter 2022 issue on the electric car ignition and car key technology. One point they emphasize about the now-traditional or old-school electric key ignition is that the keys controlled the flow of electricity in the vehicle. No key, no start. Obviously car thieves and people who lost their keys found workarounds in later, more advanced vehicles, but the starting and ignition process is much more abstracted today, as we'll discuss... In fact today some people start their cars with a smartphone app! And of course many vehicles no longer use fuel, so they start but don't ignite.
 - https://en.wikipedia.org/wiki/Car_key
- [Rachel] <https://www.caranddriver.com/news/a14499282/the-evolution-of-car-keys-is-more-interesting-than-you-think/> An article from CarAndDriver.com covers somewhat the same material, but includes more detail:
 - Although the main features of Kettering's invention have remained largely unchanged, the way drivers start their cars has undergone some major innovations over the past century, starting with how drivers use keys to start their cars. In the first decades after the self-starting ignition became the standard, keys were used mainly to turn on and off the electric current. The driver also had to push a starter button to start the engine once the electric ignition was turned on.

It wasn't until the 1949 Chrysler models that keys that could start the car with a turn of the ignition were introduced. This is how Popular Mechanics described it: *Among the innovations of primary interest to the driver is the combination ignition and starter switch which eliminates the starter button. The car starts by turning the ignition key slightly beyond the 'ignition on' position. When released, the key automatically returns to 'ignition on'. Aside from the convenience to the driver, this starter makes it impossible for children to move a car which has been left in gear by pushing the starter button.*

- In 1965, Ford came out with a double-sided key, with cuts on both sides so you could insert your key in either orientation to start your car. In the 1960s, the dual key, which could both open doors and start the car, started to appear. Prior to this, cars came with both a door/glove compartment (aka jockey box in Idaho and Montana) key and an ignition key. Door keys and ignition keys showed up at around the same time. The first fully-enclosed car was a 1910 Cadillac, but they didn't really take off until around 1913. Prior to that, car cabins were fully exposed to the elements or had a soft convertible top
 - The 1986 Chevrolet Corvette was the first to add anti-theft features to the key, adding a coded resistor to the key that is needed to start the car. By the '90s, most GM cars had this Vehicle Anti-Theft System. If the electrical resistance of the resistor is wrong, or the key is a normal key without a resistor, the circuit of the car's electrical system will not allow the engine to get started.
 - The 1983 AMC/Renault Alliance had the first version of a remote-entry key fob, but it wasn't widely adopted until the '90s.
 - In 1990, Lexus introduced laser-cut keys. The precision of the laser cuts made them harder to counterfeit.
 - Also in 1990, the switchblade key fob with the keyblade flipping out from a remote-locking key fob was introduced by Mercedes-Benz. It's now used to this day in most Volkswagens.
 - In 1993, Chevy Corvettes introduced the first proximity key. Unlike modern proximity keys, it couldn't start the car and still required an ignition key, but it could automatically lock and unlock the doors when it detected the fob close by.
 - In 2003, Mercedes-Benz offered the first fully-functional proximity key in the form of its Smart Card, which was designed to fit in a wallet like a credit card. However, the Smart Card wasn't durable. The next year, their proximity key was integrated into a hardier fob.
 - In 2004, Chevy Malibus offered the first factory-direct remote start function.
 - And starting in 2018, Tesla offered an app that made drivers' smartphones the key using Bluetooth to mimic a proximity key. There is also a credit card-style proximity key for backup if the phone dies.
- [Bill]
<https://www.cnbc.com/2022/09/08/tiktok-challenge-spurs-rise-in-thefts-of-kia-hyundai-cars.html>
- We'd be remiss if we didn't mention the recent TikTok trend of stealing Hyundais and Kias in the United States.
 - *A dangerous challenge spreading on TikTok and other social media platforms has car owners and police departments on alert across the country — challenging young teens to steal certain cars off the street using a USB cord. The target? Certain makes and models of 2010-2021 Kia and Hyundai vehicles that use a mechanical key, not a key fob and push-button to start the car. Investigators tell CNBC the trend started last year and the number of cars being stolen is continuing to surge across the country.*

The trend challenges teens to steal a car off the street by breaking into the car, popping off the steering wheel column and hot wiring the vehicle using a USB cable, similar to the wire used to charge a phone

The thieves post videos online of stealing and driving the cars, using the hashtag “Kia Boys” — which has more than 33 million views on TikTok. The social media company said in a statement it “does not condone this behavior which violates our policies and will be removed if found on our platform.

Ken McClain, an attorney in Missouri, says some of the blame for the stealing spree falls on the automakers — Kia and Hyundai — claiming the companies built cars that are too easy to steal.

McClain calls the issue a “defect.” His firm has filed class action lawsuits in 12 states so far: California, Colorado, Florida, Kansas, Illinois, Kentucky, Iowa, Minnesota, Missouri, New York, Ohio and Texas. He’s also preparing to file in as many as seven other states.

“We’re receiving dozens of calls a day,” McClain said. “The manufacturer[s] ought to be paying for this.”

Kia and Hyundai weren’t able to comment on how many vehicles are included in the make and model years and would potentially be at risk.

A Kia spokesperson said the company is concerned about the increase in thefts and has provided steering free wheel lock devices to law enforcement officials in affected areas.

“While no car can be made theft-proof, criminals are seeking vehicles solely equipped with a steel key and ‘turn-to-start’ ignition system. The majority of Kia vehicles in the United States are equipped with a key fob and “push-button-to-start” system, making them more difficult to steal. All 2022 Kia models and trims have an immobilizer applied either at the beginning of the model year or as a running change.