

THE EVOLUTION OF VEHICLE SAFETY EQUIPMENT & REGULATIONS

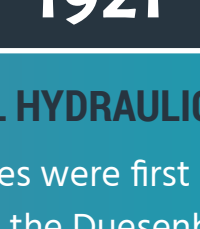
(1903-2020)



1903

WINDSHIELD WIPERS

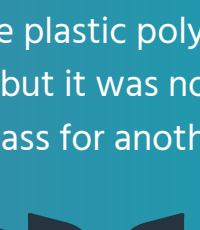
Invented by Mary Anderson, an Alabama native, when riding in a streetcar on a snowy day in New York City.



1921

4-WHEEL HYDRAULIC BRAKES

Hydraulic brakes were first introduced and produced on the Duesenberg Model A.



1927

LAMINATED GLASS (SAFETY GLASS)

Canadian chemist Howard W. Matheson invented the plastic polyvinyl butyral (PBV) in 1927 but it was not widely used for safety glass for another ~10 years.



1938

TURN SIGNAL

The concept of a turn signal dates back to 1914, however, the first flashing turn signal was used on a Buick in 1938.



1949

STANDARD DISC BRAKES

The first production disc brakes are often credited to the Crosley Hot Shot, however, they were actually patented by Frederick William Lanchester in 1902.



1952

CRUMPLE ZONES

Crumple zones were first developed and patented by Mercedes-Benz in 1952. They were first seen in production in the 1959 220, 220 S, and 220 SE models.



1959

INSURANCE INSTITUTE FOR HIGHWAY SAFETY (IIHS)

The IIHS was established by three major insurance associations accounting for 80% of the US auto insurance market.



1966

DEPARTMENT OF TRANSPORTATION (DOT)

The Department of Transportation, aka DOT, was established by President Lyndon Johnson to address the inefficiencies of the transportation system.



1974

NATIONAL MAX SPEED LIMIT 55 MPH

The US federal government passed the National Maximum Speed Law which restricted all vehicles from exceeding 55 mph on all interstate roads in the US.



1978

CHILD PASSENGER SAFETY LAW

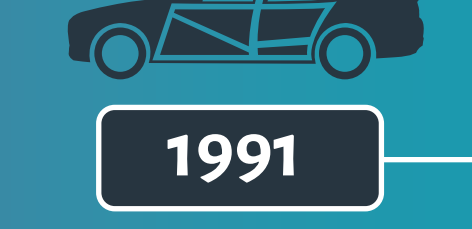
Tennessee passed the first child passenger safety law which required that young children be placed in an approved child restraint system. All states had passed child passenger safety laws by 1985.



1979

NHTSA CRASH TESTS

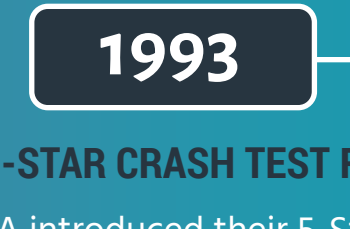
The NHTSA started crash testing new vehicles (from the front) at 35 mph and publishing the results to the public.



1988

HEAD UP DISPLAY (HUD)

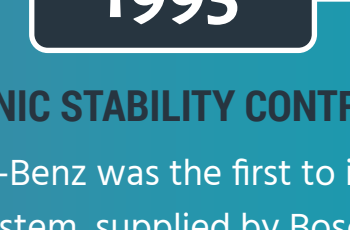
GM introduced the first HUD system in a production car. To this day, it's not a very widespread feature, though it is quite popular with luxury brands including BMW and Mercedes.



1991

SIDE IMPACT PROTECTION SYSTEM (SIPS)

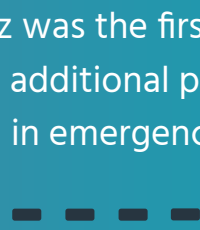
Volvo introduced the first side impact protection system to widely distribute the energy of a side collision across the entire side of the car.



1993

NHTSA 5-STAR CRASH TEST RATINGS

The NHTSA introduced their 5-Star Safety Ratings Program to help relay safety info to US vehicle owners and buyers.



1995

ELECTRONIC STABILITY CONTROL (ESC)

Mercedes-Benz was the first to implement an ESC system, supplied by Bosch. Toyota and GM also released ESC systems in 1995.



1996

BRAKE ASSIST SYSTEM (BAS)

Mercedes-Benz was the first to offer a BAS which applies additional pressure to the brake pedal in emergency situations.



2000

LANE DEPARTURE WARNING SYSTEM (LDWS)

The first LDWS was created by US-based company Iteris and debuted on Mercedes commercial trucks in Europe. It is now a widely available feature.



2003

ADAPTIVE FRONT LIGHTING SYSTEM (AFS)

Some iterations of AFS were invented in the mid-1900s, but modern day AFS systems weren't invented until 2003 by BMW and Toyota.



2006

DRIVER MONITORING SYSTEM

Lexus was the first to offer driver monitoring technology in its GS 450h model (only available in Japan) which used infrared sensors to monitor driver attentiveness.



2009

TRAFFIC SIGN RECOGNITION (TSR)

TSR first became available in 2009 with a few brands including Vauxhall, BMW and Mercedes-Benz. TSR technology is often a component of HUD systems.



2010

PEDESTRIAN DETECTION SYSTEM

Pedestrian detection systems, invented by Volvo, are often part of the AEB system. Many OEMs are pushing to make pedestrian detection part of their standard AEB systems by 2022.

2013

CYCLIST DETECTION SYSTEM

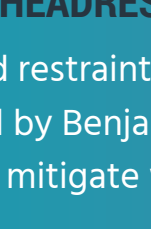
You guessed it, Volvo was the first to offer a cyclist detection system as an addition to pedestrian detection. However, it's a more complex technology and not widely available.



1911

REARVIEW MIRRORS

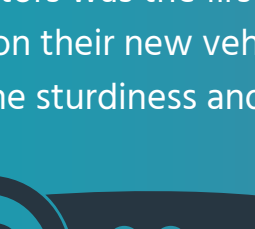
While the actual year is still disputed, many sources cite that Ray Harroun was the first to use a rearview mirror in an Indy 500 race on Decoration Day 1911, which he ended up winning.



1921

HEADREST

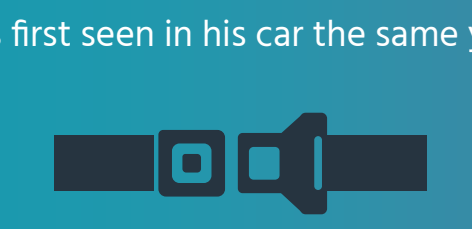
The first head restraint (aka headrest) was patented by Benjamin Katz in 1921 to help mitigate whiplash.



1934

1ST CRASH TEST

General Motors was the first to conduct crash tests on their new vehicles to help improve the sturdiness and resilience.



1948

PADDED DASHBOARD

The first padded dashboard was invented by Preston Tucker in 1948 and was first seen in his car the same year.



1949

1ST SEAT BELT (IN AMERICAN VEHICLES)

Nash was the first American manufacturer to offer seat belts as an option in 1949. The first seat belt law in the US wasn't until 1984. New Hampshire is the only state with no law.



1959

3-POINT SEAT BELTS

Volvo was the inventor of the 3-point seat belt which was first sold in Sweden on its PV544 model in 1959.



1964

REAR-FACING CHILD SAFETY SEAT

The first rear-facing child safety seat was invented by a Swedish professor, Bertil Aldam. The US didn't adopt these seats until a few years later.



1970

NATIONAL HIGHWAY TRAFFIC SAFETY ASSOCIATION (NHTSA)

The National Highway Traffic Safety Association, aka NHTSA, was established to set and enforce safety standards, ultimately reducing deaths, injuries, and economic losses due to motor vehicle crashes.



1974

DRIVER AND PASSENGER AIRBAGS

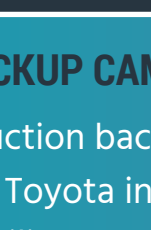
While airbags had been in the works since the early '50s, GM was the first to offer driver and passenger side airbags in their Air Cushion Restraint System (ACRS) as an option in their regular production cars.



1978

ANTI-LOCK BRAKE SYSTEM (ABS)

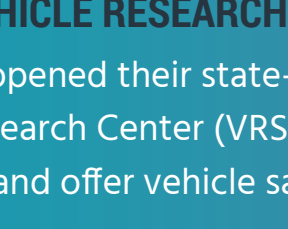
While there were earlier versions, the 4-wheel multi-channel ABS we are familiar with today was created by Bosch in 1978, and optionally available on the Mercedes-Benz W116.



1987

TRACTION CONTROL

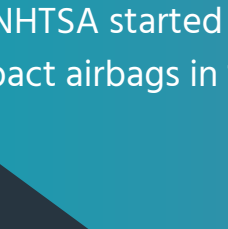
Traction control was first available on the 1987 Toyota Crown to improve traction on slippery roads.



1991

BACKUP CAMERA

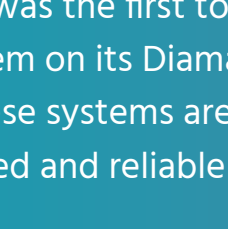
The first production backup camera was introduced by Toyota in 1991. As of 2018, rear-view visibility systems are required by the NHTSA on all cars, SUVs, trucks, and vans (almost 30 years later!).



1992

IIHS VEHICLE RESEARCH CENTER

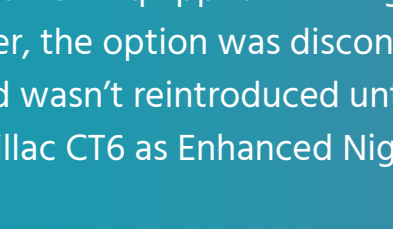
The IIHS opened their state-of-the-art Vehicle Research Center (VRS) to perform crash tests and offer vehicle safety ratings.



1994

SIDE IMPACT AIRBAGS

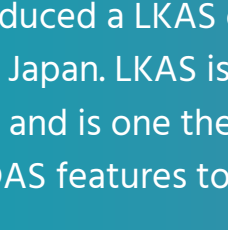
Side impact airbags were introduced by Volvo. NHTSA started testing side impact airbags in 1996.



1995

ADAPTIVE CRUISE CONTROL (ACC)

Mitsubishi was the first to introduce an ACC system on its Diamante model. However, these systems are much more advanced and reliable today.



2000

NIGHT VISION

The 2000 Cadillac Deville was the first production car equipped with Night Vision. However, the option was discontinued in 2004 and wasn't reintroduced until 2016 on the Cadillac CT6 as Enhanced Night Vision.



2001

LANE KEEPING ASSIST SYSTEM (LKAS)

Nissan introduced a LKAS on their Cima model sold in Japan. LKAS is often coupled with a LDWS and is one the most popular ADAS features today.



2004

BLIND SPOT INFORMATION SYSTEM (BLIS)

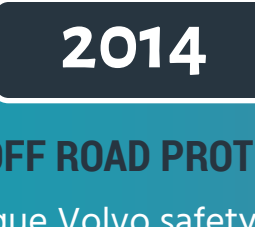
The first BLIS was introduced by Volvo at the North American International Auto Show in Detroit.



2007

AUTONOMOUS EMERGENCY BRAKING (AEB)

AEB was first invented by Volvo. Studies show AEB to be the most effective of all ADAS features and will soon be a standard feature across OEMs (hopefully by 2022).



2010

REAR CROSS-TRAFFIC ALERT (RCTA)

Chrysler and Ford were the first OEMs to make RCTA an optional feature in 2010. This is now a widely available ADAS feature, standard on many vehicles.



2013

AUTOMATIC REVERSE BRAKING SYSTEM

The 2013 Infiniti JX35 was the first vehicle to offer this system, which functions much like AEB, only at lower speeds.

2014

RUN-OFF ROAD PROTECTION

This is a unique Volvo safety feature that is not preventative but reactive. When the vehicle detects it has been driven off-road (and is still in motion), the seatbelts will tighten firmly to help avoid spinal injury.