Back Bumper

<https://youtu.be/HvW_GxlCLZ0?t=1m58s>

In addition to absorbing small to medium impacts and reducing the damage on the car’s frame, the bumper also helps to reduce the impact when the car strikes a pedestrian, due to it’s deformable nature. This reduces the injury that would be sustained by the pedestrian.

Rear Foglight

<https://youtu.be/jINrFUW7MKk?t=1m9s>

Under rainy or foggy conditions, the rear foglight improves visibility by providing a bright red light, allowing other road users behind the car to be able to see the car from a distance. It should not be used on a clear day as it is too bright and becomes a distraction to other drivers.

Reverse sensor

https://www.youtube.com/watch?v=3ZjthbW\_z34

Using ultrasonic waves, reverse sensors help to judge the distance between the rear of the car and any obstacle. This is a useful safety feature as it allows the driver to know if there are any people/animals/things behind the car when reversing.

Front bumper

<https://www.youtube.com/watch?v=nmGgBmndXRo>

(up to 0:33)

In addition to absorbing small to medium impacts and reducing the damage on the car’s frame, the bumper also helps to reduce the impact when the car strikes a pedestrian, due to it’s deformable nature. This reduces the injury that would be sustained by the pedestrian.

Forward collision sensor

<https://www.youtube.com/watch?v=PzHM6PVTjXo>

Designed as an assistant, not a substitute, the forward collision sensor “reads” the road ahead, looking out for obstacles (most commonly cars, but in more sophisticated systems, humans and animals as well) ahead. If there is an obstacle detected and the system knows that the car is going to crash into it, the system either provides a warning to the driver or take action autonomously without any driver input (by braking) – depending on the system. Collision avoidance by braking is appropriate at low vehicle speeds (e.g. below 50 km/h) but at high speeds, the system drastically minimises the impact of a collision.

This system can be branded as Forward Collision Warning, Collision Warning with Brake Support, Automatic Emergency Braking, Pre-Safe or IntelliSafe.

Airbags

<https://www.youtube.com/watch?v=U6gNknUQbio> (up to 1:12)

Airbags are designed to be supplemental restraint systems, that is they are designed to work with other systems like the safety belts, to reduce the impact of a collision, should a large enough collision occur. When the system detects a large impact, it will decide if the airbags need to be deployed, and if so, it will cause the necessary airbags to deploy. The airbag itself acts as a cushion to slow down the deceleration of the person in the car, and prevent them from hitting the hard surfaces in the car. Modern cars have airbags in the front steering wheel, front dashboard for the front passenger, side airbags from the sides of the seats as well as curtain airbags that cover the windows for the length of the car, as standard. In some newer cars, there are even airbags in the seatbelts. An airbag can be identified by the airbag word stamped on that surface, indicating an airbag is present under that surface. Once deployed, an airbag has to be replaced, it cannot be reused.

Seat belt

https://www.youtube.com/watch?v=k2twNZc-gGI

Seat belts are designed to reduce the speed of the person wearing the belt should the car abruptly come to a stop (ie in a frontal impact where the person is thrown forward). It works together with the airbags, where the seatbelts lock the person in place (through the emergency locking mechanism), and progressively relaxes the lock allowing the person to fall forward slower into the deployed airbag. In the case of a side impact, it prevents a person from being thrown about in the car, while in the case of a rear impact, seat belts help to keep the person in the correct position in the seat for the active headrests to work to reduce whiplash.

Head rest

https://www.youtube.com/watch?v=qMEZCNImJX4

In addition to providing more comfort to the driver and passenger, the headrests also act as a “catch” for the neck and head of the person when the head and neck gets pushed back in the event of a rear impact. Modern cars include active headrests, designed to fit better to the structure of the neck and head of a person and further reduce the whiplash effect.

ABS

https://www.youtube.com/watch?v=l9w0RlbuRmE

Anti-Lock Braking System, more commonly known as ABS is a system designed to ensure a car is still manoeuvrable under hard braking. In normal brakes, when the brakes are engaged suddenly and hard, the front wheels tend to lock up, where the wheels actually stop moving but in actual fact the car is still moving in the original direction, causing the driver to be unable to manoeuvre the car unless they release the brakes, or pump the brake pedal when trying to slow down. ABS is designed to automate the pumping action, so in the case of the car detecting sudden, heavy breaking, the system kicks in and pumps the brakes, causing the brakes to be engaged, and disengaged for a short period before being re-engaged again, repeatedly. This allows manoeuvrability of the car under heavy breaking, without the driver having to pump the brake pedal. As a result, for the system to work properly, the drivers just have to press the brakes, and manoeuvre as the system will kick in, if equipped. When engaged, the user would feel a slight pulsation in the brake pedal, this is a sign the system is working.

ESP

https://www.youtube.com/watch?v=k8h3Kv7fU1A

Electronic Stability Program (ESP) or also known as Electronic Stability Control (ESC) (often marketed as ESP/ESC or other brand names like Dynamic Stability Control (DSC) and Vehicle Stability Control (VSC)) is an electronic system designed to ensure the car does not skid when being driven. The system is active regardless if the accelerator or brake pedal is engaged. There are sensors in the car that monitor the forward and sideway movement of the car’s body. When it detects sudden sideway motion of a large amplitude, the system will kick in by cutting off the accelerator, and applying the brakes to the individual wheels in order to restore directional stability of the car. It also monitors for slip in the wheels, if it detects wheel slip, the system kicks in to limit power to the wheels and reduce wheel slip. In general, when the system is active, a flashing ESP symbol would appear in the instrument cluster (with a beep sound in some cars), indicating the system has been activated and is trying to restore stability and traction. In some situations the system may need to be disabled (like driving on a track or driving on sand), hence there is a button that is usually available marked with the ESP OFF symbol on it.