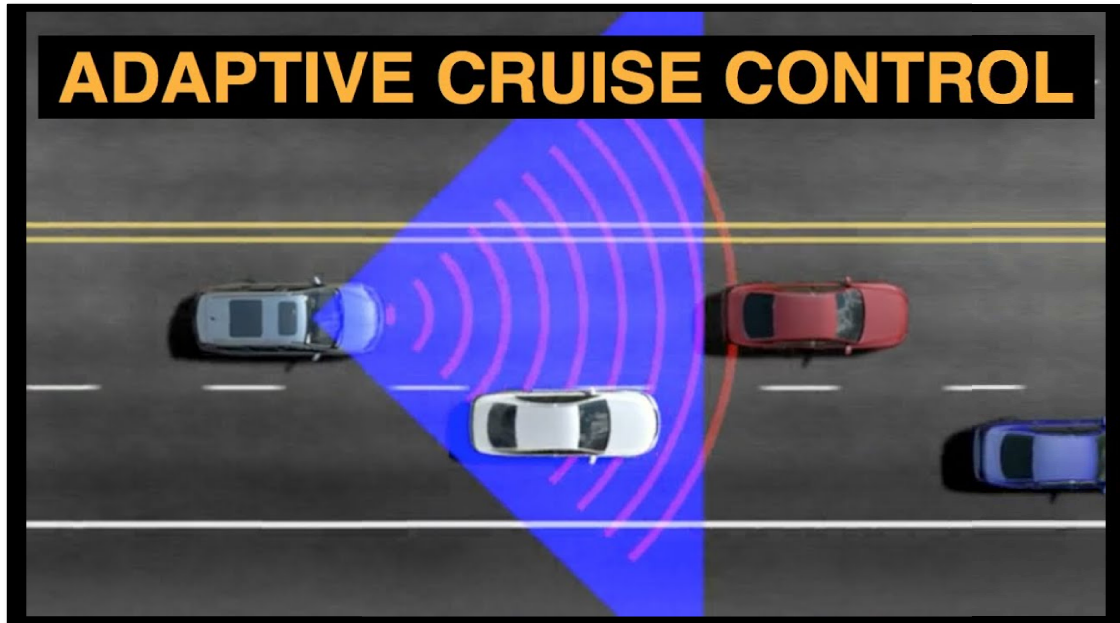


## UNIT-VI

Relevance/Objective:-

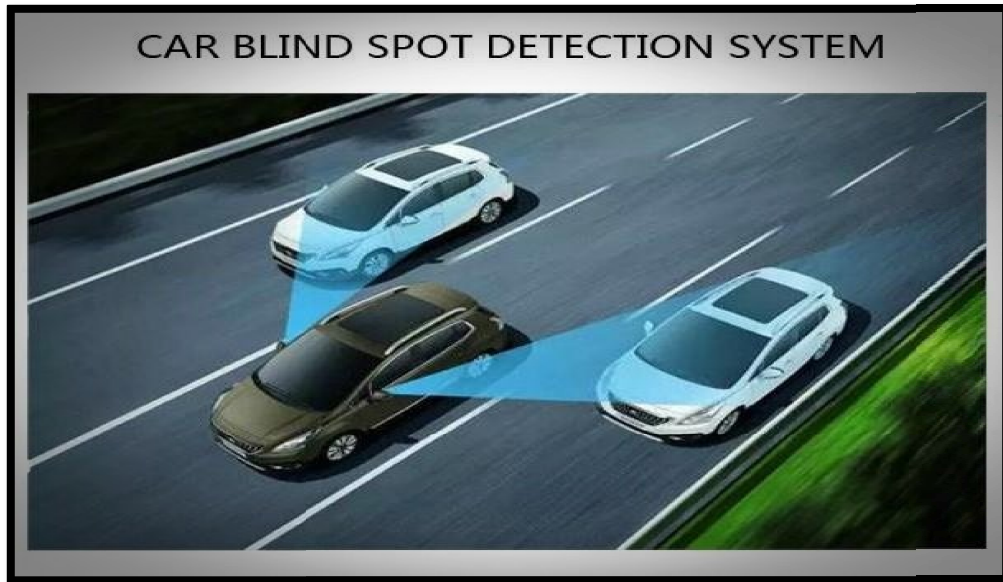
To understand modern features of automobile or vehicle system.

### 1. Adaptive cruise control/collision mitigation



Modern cruise control goes beyond just maintaining a constant speed. Thanks to sensors and the use of radar, cruise control can now adjust the throttle and brakes to keep a safe distance from the vehicle in front of you if there are changes in traffic speed or if a slowpoke cuts in. If the system senses a potential collision, it typically will brake hard and tighten the seatbelts. Once it knows the lane is clear or traffic has sped up, it will return your car to its original cruising speed, all without your input. Of course, you may override the system by touching the brakes. The Mercedes-Benz and Maybach systems go by a less obvious name: Distronic.

## 2. Blind-spot detection/side assist/collision warning



This technology is designed to alert you to cars or objects in your blind spot during driving or parking, or both. Usually it will respond when you put on your turn signal; if it detects something in the way, it may flash a light in your mirror, cause the seat or system.

## 3. Lane-departure warning/wake-you-up safety



This is similar to blind-spot/side-assist technology but with more range. It judges an approaching vehicle's speed and distance to warn you of potential danger if you change lanes. It can also warn if it determines your car is wandering out of the lane, which could be useful if you become distracted. This could come in the form of a vibration through the seat or steering wheel, or an alarm. Down the road expect lane-departure warning to even be able to monitor body posture, head position and eye activity to decide if the driver is falling asleep and the vehicle is behaving erratically. At that point, the system may even be capable of slowing the car down and engaging stability control.

#### **4. Rollover prevention/mitigation**

Most automakers offer an electronic stability control system, and some offer a preparation system (seatbelts tighten, rollbars extend). However, what we're talking about is more intelligent than that. If the system senses a potential rollover (such as if you whip around a corner too fast or swerve sharply), it will apply the brakes and modulate throttle as needed to help you maintain control. DaimlerChrysler calls it Electronic Roll Mitigation, Ford named it Roll Stability Control, and GM's is Proactive Roll Avoidance. Range Rover's is Active Roll Mitigation, while Volvo's is called Roll-Over Protection System. But they all have the same goal.

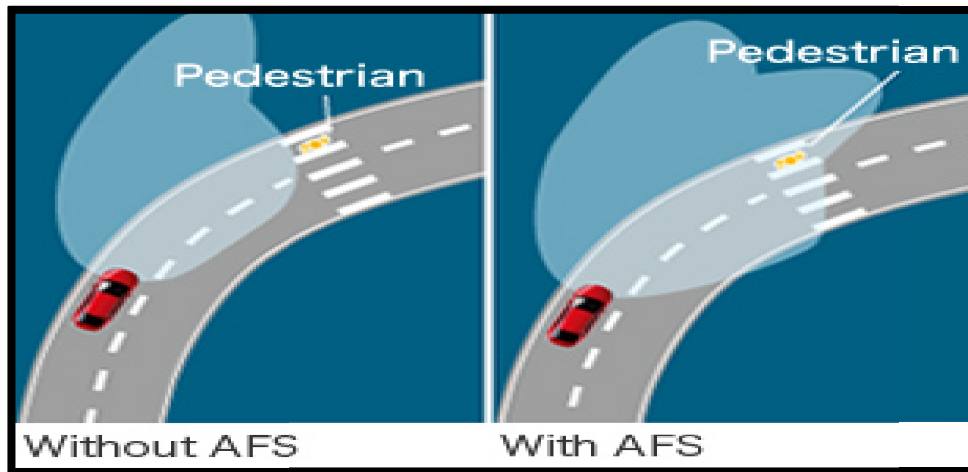
#### **5. Occupant-sensitive/dual-stage airbags**

All humans are not created equal, and airbags are evolving to compensate in the form of low-risk, multistage and occupant-sensitive deployment. Technology can now sense the different sizes and weights of occupants as well as seatbelt usage, abnormal seating position (such as reaching for the radio or bending to pick something off the floor), rear-facing child seats and even vehicle speed. While driver, passenger and side curtain airbags are nothing new, sensing airbags are popping up (so to speak) everywhere.

#### **6. Emergency brake assist/collision mitigation**

This brake technology is different from an antilock braking system or electronic brake force distribution, in that it recognizes when the driver makes a panic stop (a quick shift from gas to brake pedal) and will apply additional brake pressure to help shorten the stopping distance. It may also work in conjunction with the smart cruise control or stability control system in some vehicles if it senses a potential collision. It is often called brake assist, although BMW, for example, refers to it as Dynamic Brake Control.

## 7. Adaptive headlights and/or night-vision assist



Night vision can be executed in different forms, such as infrared headlamps or thermal-imaging cameras. But no matter the science, the goal is the same: to help you see farther down the road and to spot animals, people or trees in the path – even at nearly 1,000 feet away. An image is generated through a cockpit display, brightening the objects that are hard to see with the naked eye. Adaptive headlights follow the direction of the vehicle (bending the light as you go around corners). They may also be speed-sensitive (changing beam length or height), or compensate for ambient light.

## 8. Rearview camera

Rearview cameras not only protect your car, but also protect children and animals from accidental back-overs. Backing up your car has graduated from side mirrors tilting down or causing chirps and beeps to real-time viewing. New-school tech involves a camera that works with the navigation system to provide a wide-open shot of what's happening behind you to help with parking or hooking up a trailer.

## 9. Emergency response

There are a variety of ways vehicles now and in the future will handle an emergency situation. For example, DaimlerChrysler's Enhanced Accident Response System (EARS) turns on interior lighting, unlocks doors and shuts off fuel when airbags deploy, while Volkswagen's also switches on the hazards and disconnects the battery terminal from the alternator. In addition, GM's OnStar and BMW Assist both alert their respective response centers of the accident and make crash details available to emergency personnel.

## 10. Remote keyless entry

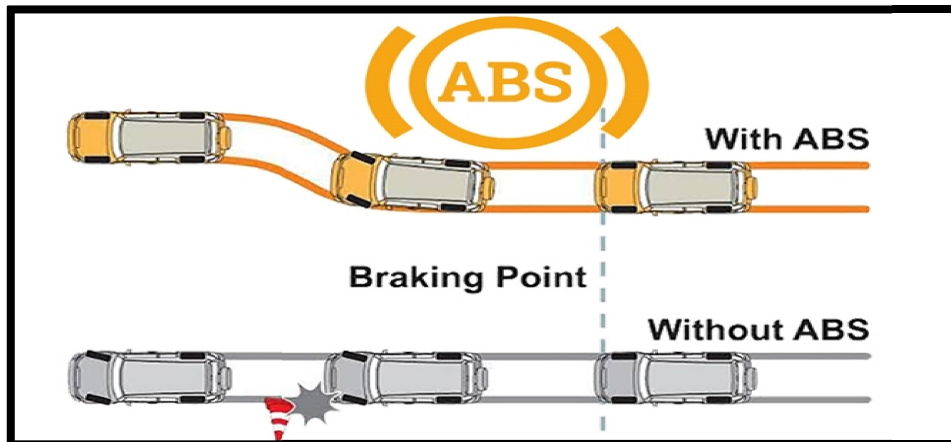


Keyless entry systems allow you to unlock your car by pushing a button on a remote. The ability to quickly get into your car without fumbling for the key is an important safety feature, especially in poorly-lit areas. With most remotes, pushing the button once unlocks just the driver's door; you must push twice to unlock other doors, so there's no worry about a hidden intruder jumping into the passenger's side. Most also have a panic button that honks the horn and flashes the lights.

## 11. OnStar System

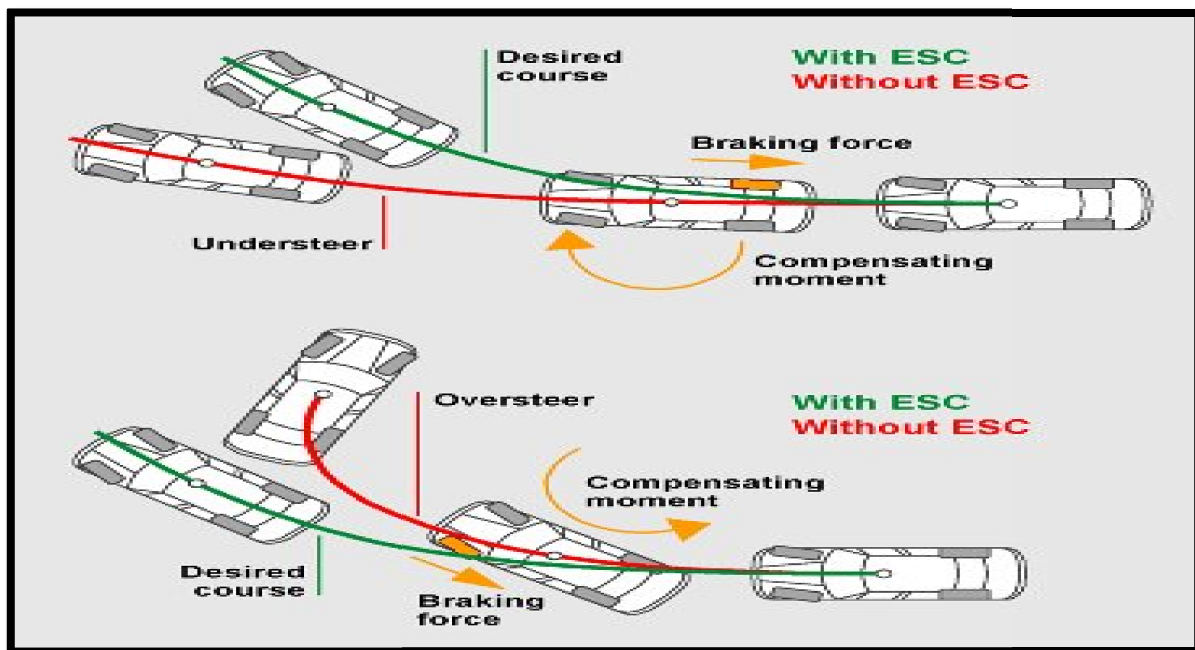
With OnStar, help from a real-live person is always just a button-push away. Got a flat tire? Someone following you? Just need to hear a human voice? Push the button. OnStar advisors can summon a tow truck or a cop, or just say hello. If your airbags deploy, they call you. They can even track your car if it's stolen and remotely let you in if you're locked out. OnStar charges a monthly subscription fee; the basic plan gives you the most critical safety benefits and is a bargain at \$17/month.

## 12. Anti-lock brakes (ABS)



Simple physics dictates that a turning wheel has more traction than one that is skidding. Antilock brake systems (ABS) watch individual wheel speeds; if one locks up, they pump the brakes far faster than a human could. Don't worry about giving up control to a computer; if the ABS system goes on the fritz (they rarely do) the brakes work normally. Do-it-yourselfers can still do their own brake jobs (though you must relieve system pressure before removing a brake line; check your repair manual).

### 13. Electronic stability/skid-control system



ESC systems use the anti-lock brake sensors (which show individual wheel speed), accelerometers, and steering wheel/pedal position sensors to figure out what the car is doing and what the driver wants it to do. If the two don't seem to match up, ESC does what no driver can: It applies the brakes to individual wheels and reduces power as needed to keep the car going where the driver is trying to point it. They are almost transparent and work surprisingly well.

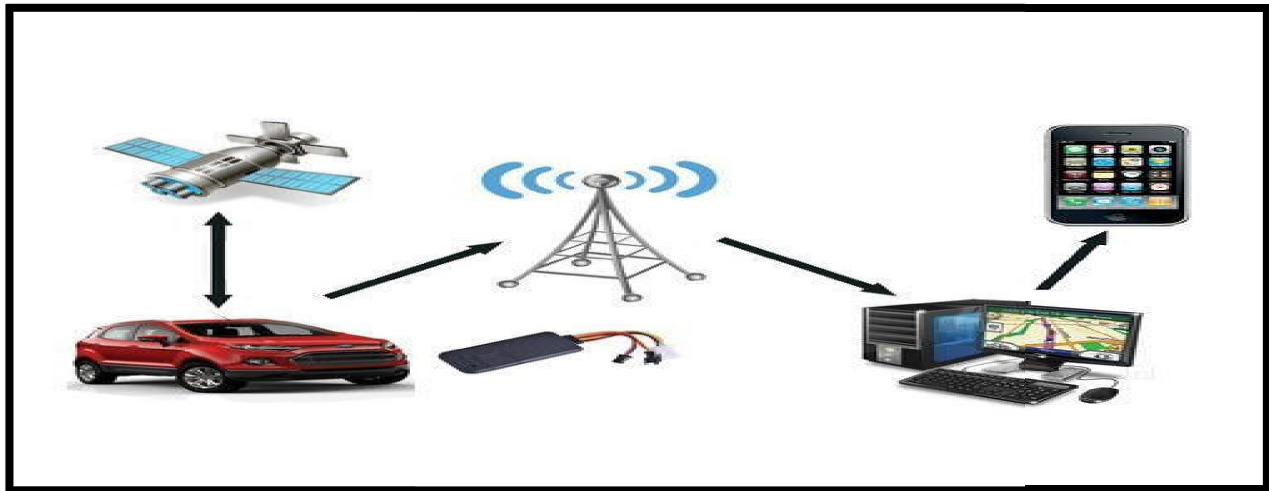
### 14. Telescoping steering wheel/adjustable pedals

Most new cars have height-adjustable (tilt) steering columns; some cars have steering wheels that telescope (move in and out) and/or electrically adjustable pedals. The latter two not only make finding a comfortable position easier, but they allow shorter drivers to safely position themselves farther from the airbag while still keeping their feet comfortably on the pedals.

### 15. Rear-seat DVD player

Got kids? Movies-on-the-go can make long trips easier for both you and them. Many rear-seat entertainment systems include wireless headphones, so you can enjoy the stereo (or the peace and quiet). My own children would have TVs surgically implanted in the backs of their hands if they could, so in order to avoid turning them into road-going zombies I generally limit movie watching to long trips. They also make a convenient reward and/or dangling carrot.

### 16. GPS navigation system



Using the Global Positioning Satellite System and sensors in the car, GPS navigation systems can pinpoint your exact location and give you turn-by-turn directions (via a small video screen, spoken voice, or both) to help you find your way. Most will also guide you to the closest gas station, ATM, hospital or police station. They can steer you out of a bad neighborhood, they can route you around traffic, and no matter how lost you get, they can always help you find your way home.

### 17. Side airbags

Most cars have at least three feet of crush space at the front and back, but only a few inches of protection at the sides. Federally-mandated door beams help keep the car intact instead of caving in. But there's still the problem of inertia: While the car is being pushed away, your body (particularly your head, which isn't secured by the seat belt) wants to stay still, and it could go right through the side window. Side airbags cushion your noggin and help keep it safely inside the car.

### **18. Center console with power outlet**

Open the center consoles on many new cars and you'll find a power outlet (a.k.a. a cigarette lighter without the lighter). These outlets provide a way to charge your mobile phone while keeping it out of sight. I'm dead-set against talking on the phone while driving (though I sometimes do it anyway), but it's good to know you'll always have juice to make a call in case of an emergency.

### **19. Roadside assistance**

Flat tire? Dead battery? Out of gas? Traditionally, people have turned to AAA (US) or CAA

(Canada) for life's little motoring emergencies, but many new cars come with roadside assistance as part of their new-car warranty. Several manufacturers even offer it as part of their "certified used" programs. That said, AAA and CAA memberships are inexpensive; with all the travel discounts they bring, your membership may very likely pay for itself.