

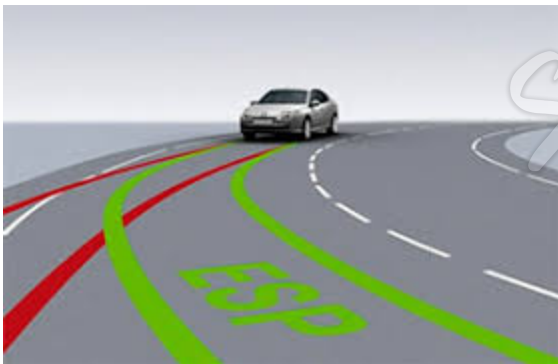
# Chapter 14: Safety and Economical Driving

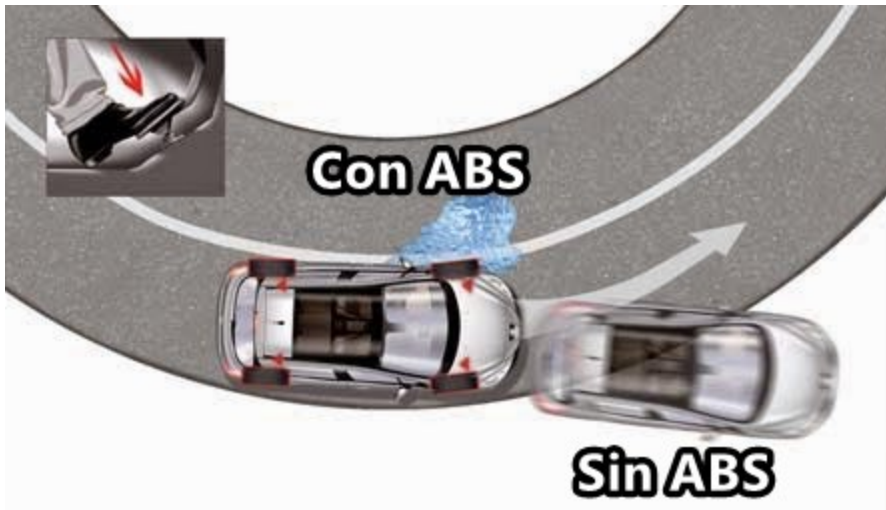
To prevent accidents, you should perform periodic and preventive maintenance of the vehicle, especially brakes, tyres and lights.

## 14.1 Active safety features

Prevent an accident, some examples are:

- **Power assisted steering:** reduces resistance to move the steering wheel
- **Lighting:** Xenon/bi-xenon lamps (+ light, - glare), adaptive (moving), daytime running lights (recommended)
- Assisted braking systems:
  - **ESP:** stability control, corrects skidding if detected
  - **Traction control:** corrects lack of adhesion if detected
  - **ABS:** emergency braking, prevents wheel lock during braking
  - **Cruise control:** maintains the pre-set speed





## 14.2 Passive (or secondary) safety elements

If you have an accident, passive safety features reduce damage. Some examples are:

### Seat belt:

Required for:

- Passenger cars and mixed adaptable vehicles, for all seats and on all types of roads
- 3500kg trucks: in the front seats

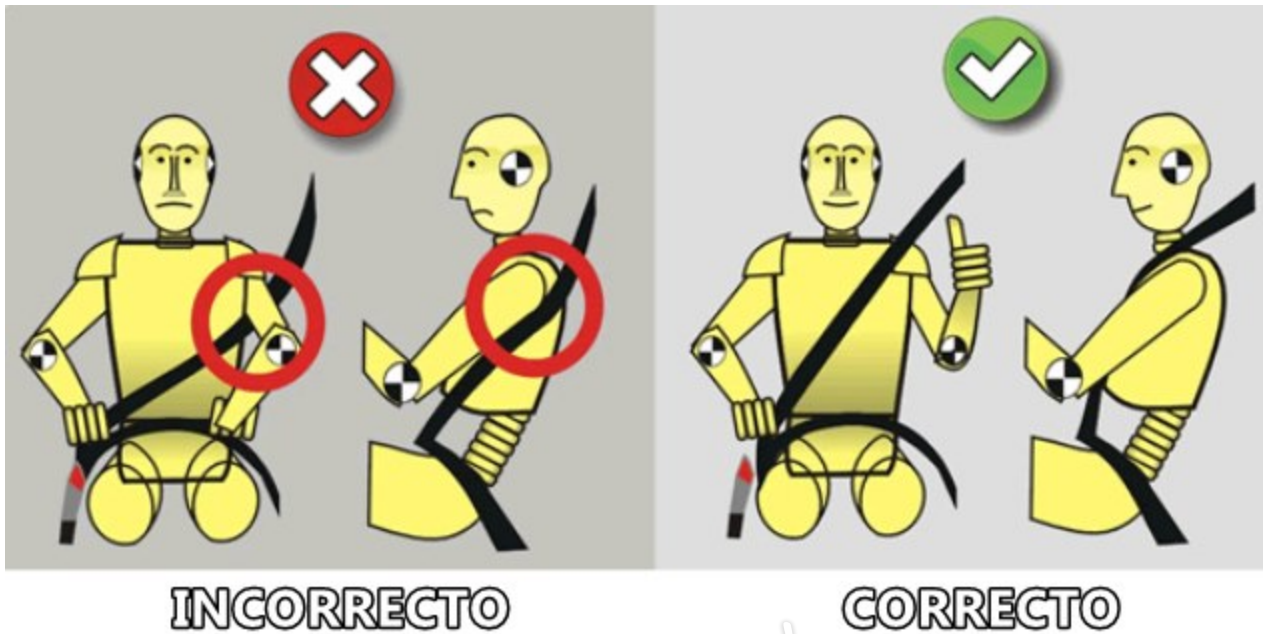
Not required for:

- In a built-up area:
  - During parking and reversing
  - Priority and driver's education vehicles
  - Deliverymen on short journeys
- Out of a built-up area:
  - Parking and reversing
  - Always: For medical reasons (always carry medical certificate)

It must be well anchored, tight fitting, and must pass over the collarbone and below the abdomen.

After an accident, it must be changed and inspected.

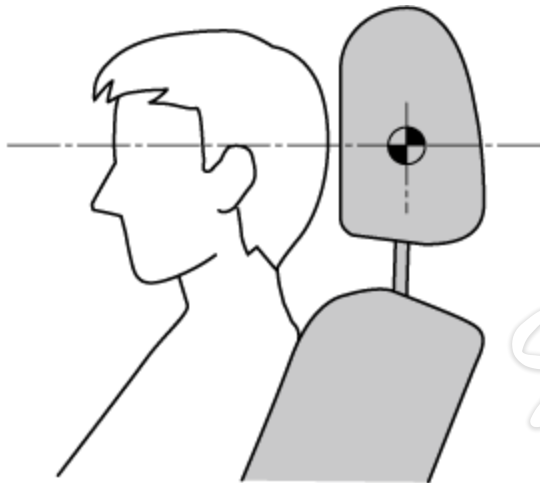
Adjust it well, do not wear bulky clothes, do not use clamps, towels, pillows, covers, etc. because the body can slide under the belt during braking (submarine effect).



**The airbag:**

Complements the seatbelt, should be inspected when indicated by the manufacturer. The airbag cushions an impact.

**The head restraint:**



Prevents whiplash. It is mandatory, and the thickest part of the head restraint must be at eye level.

**Child safety restraining devices:**

The safest placement of these devices is in the rear centre seat, as it is less affected by lateral impacts.

**Age restrictions in restraint systems:**

- Children under 3 years: Mandatory use. Always rear-facing and with the airbag disconnected
- Children who are less than 135cm tall cannot travel in the front seat of the vehicle. They must also be seated in a child restraint seat appropriate to their size and weight

- Children between ages 3 and 12: Mandatory, unless they are 135cm or taller



Shahid  
Raja

## 14.3 Preventative Safety

### Reflective Vest:

It is mandatory to carry 1, although it is advisable to carry 2. Always at hand for the driver without them having to get out of the vehicle to get it. It will be used outside of built-up area both day and night.

### Trips:

Check the condition of the vehicle, evenly distribute the load, review the documentation and tyre pressure, etc.

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## 14.4 Braking distance

The distance travelled by the vehicle from when the driver applies the brake until fully stopped.

Higher speed -> increases braking distance

The braking distance of a loaded vehicle is greater than when it is unloaded.

## 14.5 Reaction distance

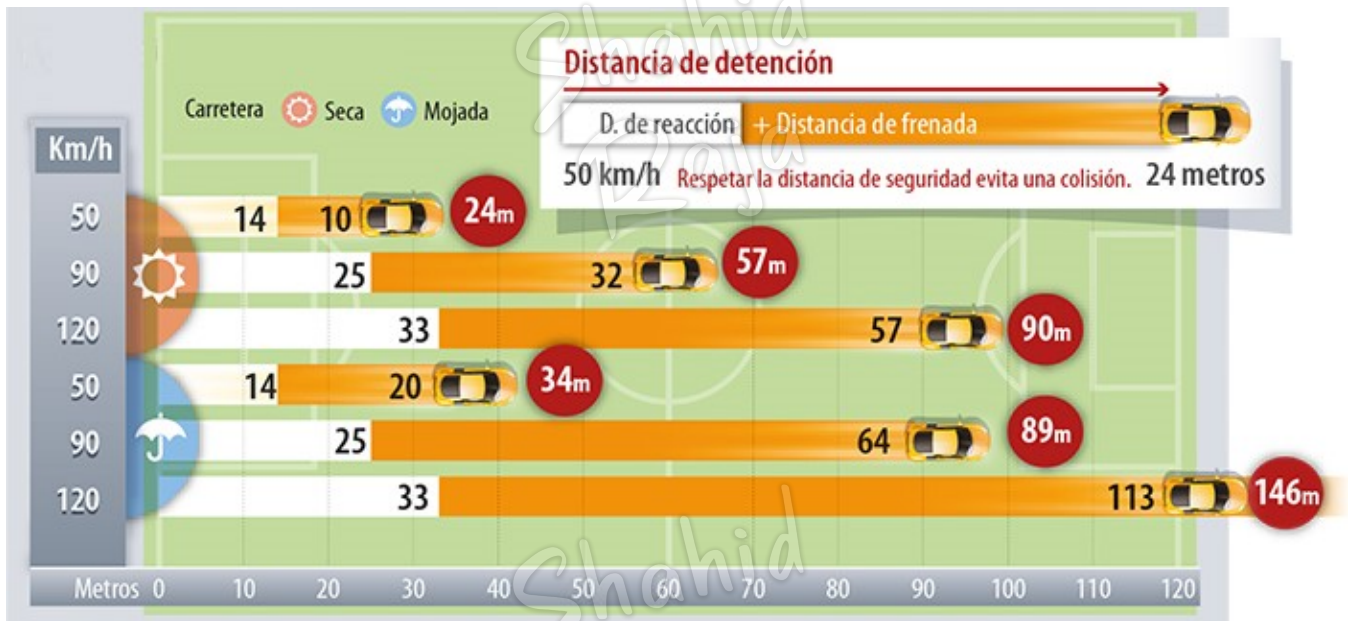
The **distance travelled** by the vehicle during the reaction time. From when the driver perceives a hazard (an obstacle, a signal, noise, etc.) until they respond to it.

## 14.6 Reaction time

Between half and one second. It is the time between seeing an obstacle until stepping on the brake. During that time, the distance travelled is called **reaction distance**.

The reaction time depends on the state of the driver: age, fatigue, alcohol, etc.

**Reaction distance + braking distance = stopping distance**



## 14.7 Economical driving

Consumption does not increase proportionally with speed. Faster speeds cause much greater consumption as the friction with the air increases.

Gear changes in Gasoline engines between 2000 and 2500rpm.

Gear changes in Diesel engines between 1500 and 2000rpm. Once the engine has started, it is advisable to wait a few seconds before driving off.

**Incorrect actions:** Coasting downhill in neutral (because it wears down the brakes), not turning on the lights when required, not performing maintenance checks (you could have a leak), lowering the windows to save on air conditioning (driving with the windows open causes a lack of aerodynamics in the vehicle, which increases consumption). Skimping on maintenance, using gasoline with a lower octane rating than that recommended by the manufacturer.

The optimum air temperature is 17-21 degrees C. The use of air conditioning or climate control increases consumption up to 20%.

Consumption is lower when driving in high gears and low rpms. Uniform speed is recommended, avoiding braking and accelerating.

Increased consumption on urban roads.

**Fuel saving tips:**

- Do not use the car for short journeys
- Plan the best route
- Avoid peak hours
- Use public transport

## 14.8 Types of pollution

**Atmospheric:** high idle, dirty air filter, not having catalytic converters, engine problems...

**Acoustic:** overuse of horn in prohibited places, not having silencer/muffler...

**Prohibited:** dumping used oil, littering out the window, washing the car on public roads...

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