



# ADAS – (Advanced Driver Assistance system) Cameras, Radars, and Ultrasonic Sensors

- ✓ ADAS – To **Improve** the Active Safety System
- ✓ **It Reduces** Driver's **Work Load**, Reduces Fatigue
- ✓ ADAS – Assist, **doesn't** replace
- ✓ so **Responsibility Driver**
  
- ✓ So to control the **Vehicle in REAL** Time
- ✓ **Alerts** for Hazards, **Avoid Accidents**
- ✓ **Reduces** the Driver's **Reaction Time** – Human factor



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**ADAS**

# Benefits & Limitations of ADAS

- ✓ **Reduces:** Road accidents & driver fatigue
- ✓ **Improves:** Traffic flow & efficiency
- ✓ **Enhances:** Driving comfort
- ✓ **Prepares:** Drivers for autonomous vehicles



**Works within sensor & camera limitations (fog, rain, dirt)**

- ✓ **May fail** if drivers over-rely on systems
- ✓ **Requires regular** calibration & maintenance
- ✓ **High cost** in advanced vehicles

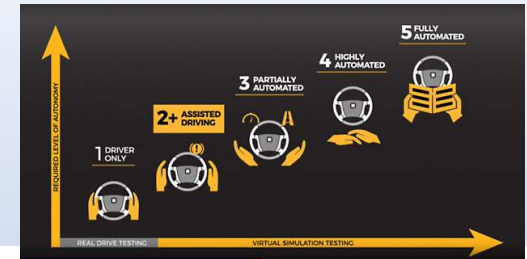
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# Levels of ADAS

- ✓ **Level 0–2:** Driver is mainly in control - No Intervene
- ✓ **Level 3:** Conditional automation — System Intervene after Alert.
- ✓ **Level 4:** High automation may need human help in rare cases
- ✓ **Level 5:** Full automation no human driver required at all.



**ADAS Can be Deactivated Temporarily or Permanently**

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# Working Principle

- ✓ **Collects Data** from vehicle surroundings.
- ✓ **Processes information** using onboard computers.
- ✓ **Warns The Driver** or takes corrective action (braking, steering, etc.)
- ✓ **Combines real-time data** and **pre-programmed safety logic**



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# **AEB** Allowed while Practical Driving Test

- ✓ **AEB** – Automatic Emergency Braking System or Urban and Interurban Emergency braking
- ✓ AEB enhances **road safety**
- ✓ **Intervene** after alerting driver
- ✓ Audible, visual, or tactile **Warnings**
- ✓ **Assisting** when a collision **risk is detected**
- ✓ If the driver **doesn't respond**
- ✓ Partial or full **Braking**



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**Allowed in Aptitud  
TEST**



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# Hill Start Assist (HSA)

- ✓ When on a **Slope**
- ✓ **Sensor detects** the angle of **inclination**
- ✓ Prevents **Rollback**
  
- ✓ When the brake **foot is lifted**
- ✓ Keeps the vehicle **stationary briefly**
- ✓ **Brakes applied** and Brake Lights On



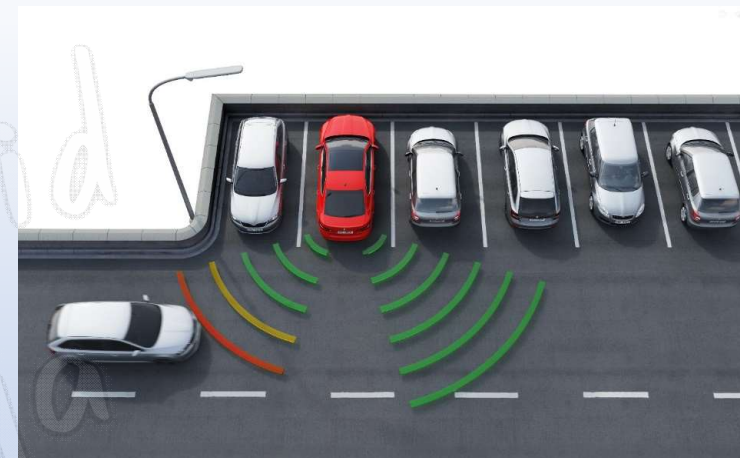
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## Rear Cross Traffic Alert(RCTA)

- ✓ **Intervenes**
  - ✓ **While Reversing**
  - ✓ **Using radar sensors to detect approaching vehicles**
  - ✓ **Pedestrians, or cyclists from the sides.**
- 
- ✓ **Hazard is detected, the system alerts the driver**
  - ✓ **Audible beeps and/or visual signals**
  - ✓ **Indicators on the infotainment screen or side mirrors**
- At a speed less than 15 km/h.**



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## Reversing Camera

- ✓ To **reduce blind spots** behind
- ✓ improves rear **visibility**
- ✓ **Reduces** the risk of **collisions**
- ✓ Makes **parking easier** in tight spaces.
- ✓ Helpful for **large vehicles**
- ✓ **Parking safely** and precisely
- ✓ **Automatic activation** when reversing
- ✓ Guidelines / **trajectory lines** that **move with steering**
- ✓ **Night vision** if low-light camera



**1<sup>st</sup> Line = 4 Feet**

**2<sup>nd</sup> Line = 2 Feet**

**Last red Line – 1 Foot**

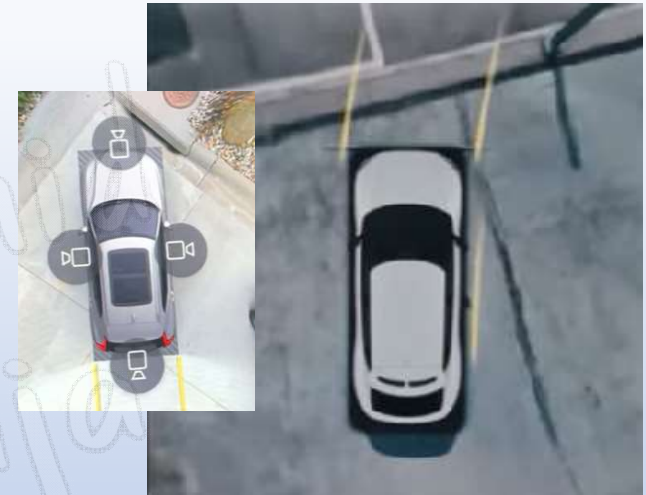
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## 360 Parking Cameras View

- ✓ To **reduce blind spots** behind
- ✓ improves rear **visibility**
- ✓ **Reduces** the risk of **collisions**
- ✓ Makes **parking easier** in tight spaces.
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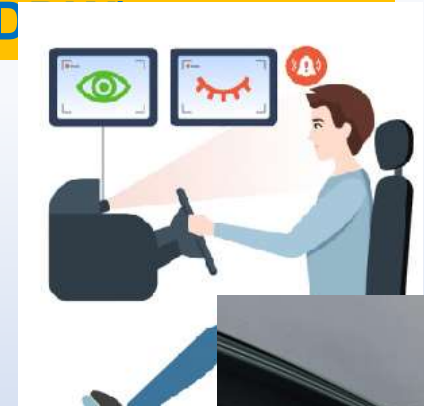


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# Fatigue Detection System

Advanced Driver Distraction Warning (AD

- ✓ Monitor The **Driver's Behavior**
- ✓ Identify Signs Of **Drowsiness Or Fatigue**
- ✓ **Lane Drifting Or Sudden Steering**
- ✓ **Prevent Accidents Caused By A Lack Of Attention, Fatigue, Or Sleepiness**
- ✓ By **Alerting** The Driver To Take Action
- ✓ Features Like **Blinking Frequency**
- ✓ **Head Position, Or Eye Movements**



**No Intervene**  
Advance System Will  
have

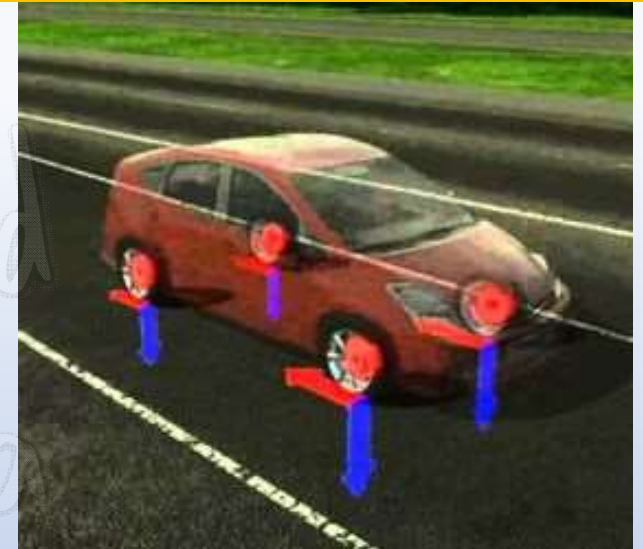
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## **EBD” (Electronic Brake-force Distribution)**

- ✓ During **Emergency Stops**
- ✓ **Optimize Braking** By Adjusting The **Distribution Of Braking Force**
- ✓ Between The **Front And Rear Wheels**
- ✓ Based On **Load And Road Conditions**
- ✓ **Works With Systems (AEB)**
- ✓ **Ensures Effective Braking Force Distribution**
- ✓ To Avoid **Skidding Or Losing Control**



- 1. Preventing Skidding**
- 2. Shorter Braking Distance**

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## **LDW (Lane Departure Warning)**

- ✓ Designed To **Enhance Safety**
- ✓ Vehicle **Unintentionally Drifts** Out Of Its Lane
- ✓ When The Driver Is **Distracted, Drowsy**
- ✓ Or **Not** Paying Full **Attention**
  
- ✓ Uses **Cameras Or Sensors**
- ✓ To Monitor The Vehicle's Position Within The Lane
- ✓ **Vehicle Crosses Lane Markings** Without Signaling



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**No Intervene**

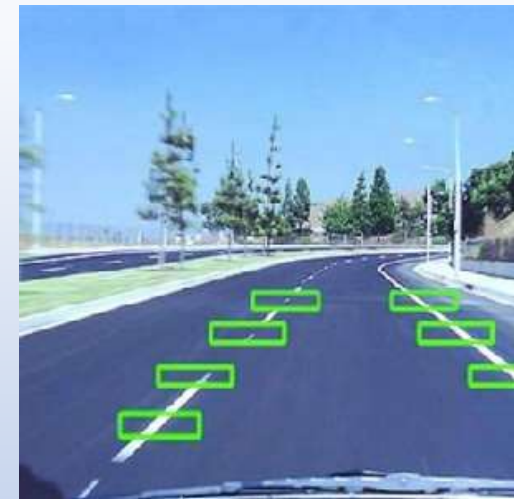


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## LKA (Lane Keeping Assistant)

- ✓ **Maintaining their position** within the lane
- ✓ **No indicator**, lane drifting is **detected**  
**It starts Working**

- ✓ LKA - it **Interven**es
- ✓ And **Correct The Steering** wheel
- ✓ **If indicator on** = it remains **deactivated**



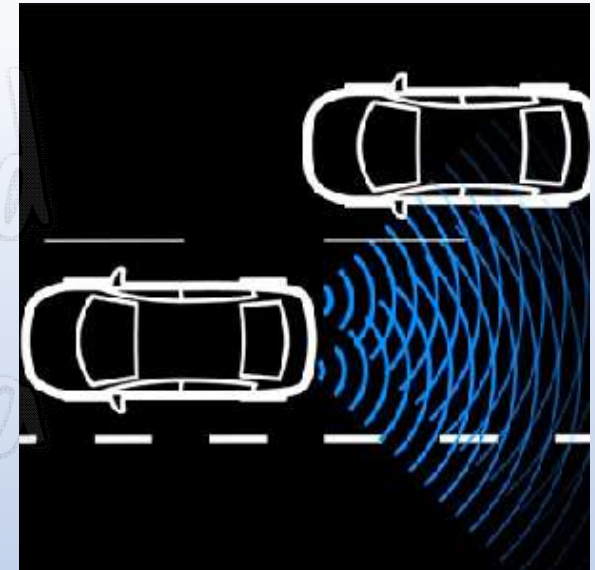
**Interven**es  
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## Blind Spot Monitoring Information System BSIS

- ✓ Informational **purposes**
- ✓ **Alerting** the driver to vehicles
- ✓ Or objects in the **blind spot**
  
- ✓ The **driver** maintains **Complete control**
- ✓ System serves as an **Additional info**
- ✓ **Especially** when **changing lanes.**



**No Intervene**

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# Traffic Sign Recognition

TSR

- ✓ Uses A **Camera Or Sensors**
- ✓ Mounted At The **Rear Of The Interior Mirror**
- ✓ **Detect And Read Vertical Traffic Signs**
- ✓ Designed To **Capture Images Of Road Signs**
- ✓ Such As **Speed Limits, No Entry**
  
- ✓ Then **Processed By The System**
- ✓ Displays Info On **Dashboard**
- ✓ To **Alert The Driver**

**Not Allowed in Driving TESTS**





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## TPM – Tyre Pressure Management

- ✓ **Monitor and detect** changes in tire **pressure**
- ✓ **Alerts** the driver
- ✓ On **significant variation** in the pressure
- ✓ **One or more** tires
- ✓ Affect the **vehicle's safety**
- ✓ Fuel **efficiency**, and **handling**
- ✓ Prevents **blowing out tyres**



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## ISA – Intelligent Speed Assistant

- ✓ Helps drivers comply with speed limits
- ✓ Improve road safety
- ✓ Cameras and gps data to detect speed limit signs
- ✓ Alerts the driver if they exceed the limit
- ✓ Sign blinks

**No intervene, No Slow Down**

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## SLI or Speed Limitation Devices

- ✓ **Driver specifies the maximum speed**
- ✓ **Such as in Urban area**
- ✓ **It limit the maximum speed of a vehicle.**
  
- ✓ **It doesn't let the vehicle go over**
- ✓ **It STOPS the supply of fuel**
- ✓ **So No more Accelerator**



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