

# Advanced driver assistance systems: What drivers should know

We continue to see the integration of advanced driver assistance systems (ADAS) in vehicle lines, including farm equipment like tractors, as safety technology develops and evolves. ADAS are designed to assist drivers by warning them of hazardous conditions and/or taking over vehicle control when imminent crashes are detected.

An Insurance Institute for Highway Safety (IIHS) study found there are clear benefits in crash avoidance technologies. For example, vehicles equipped with forward collision warning (FCW) and automatic emergency braking (AEB) had 50% fewer rear-end collisions.<sup>1</sup> A University of Michigan Transportation Research Institute study found similar benefits of using ADAS.<sup>2</sup>

## Key items that drivers should know about ADAS

As with any new technology, drivers need to understand how ADAS functions to receive the full benefit and prevent potential negative impacts.

### Drivers must understand what systems their vehicle is equipped with and how the systems function:

- While sounding similar, ADAS are different depending on the manufacturer, vehicle model and vehicle year. Is emergency braking assist the same as automatic emergency braking? Don't assume that a vehicle's system works like that of another vehicle you've driven.
- Understand the difference between active and passive systems. Active safety features can prevent accidents from happening. Passive safety features can lessen the chance of death and serious injury where an accident is unavoidable.
- Review your operator's manual to:
  - Identify what systems are in your vehicle.
  - Understand how the systems operate and how to respond when activated.
  - Understand limitations of the systems.

## Do not turn off or disable an ADAS

Unless directed by the operator's manual, their employer for certain driving situations, or the system is malfunctioning, drivers should not turn off or disable ADAS.

### Disabling the system:

- Could place you in a less safe environment.
- Endanger subsequent drivers of the vehicle, who may not realize the system has been turned off and may be relying on it.
- May expose you and your business to additional liability in an accident that could have been prevented if the ADAS had not been disabled.

## Do not become over-reliant on ADAS

- ADAS is designed to assist a driver, but the driver must still maintain full control of the vehicle. Always practice defensive driving skills. This includes full attention on your driving, maintaining adequate space around your vehicle, scanning, anticipating, and reacting to your surroundings.
- Do not take risks such as following too closely or performing distracting activities, thinking the ADAS will cover for you. These systems do not work in all driving situations and for all hazards.
- Many ADAS systems are good at recognizing cars but are not good at recognizing motorcycles, bikes, pedestrians, animals or other objects on the roadway.
- Many systems do not function well when on roadways without proper lane markings, on curves, during inclement weather or when sensors are obstructed or damaged.

## Common ADAS technology

### Forward collisions

- **Adaptive cruise control (ACC):** Similar to cruise control, it is set by the driver when desired, typically on interstates. The system will maintain a constant following distance from the vehicle in front. It's designed to prevent rear-end collisions and maintain proper following distance.
- **Forward collision warning (FCW):** This feature warns a driver with audio and/or visual alerts that there is a possibility of a collision with an object in front of the vehicle. This feature is sometimes paired with automatic emergency braking to stop the vehicle on its own before the driver reacts.
- **Automatic emergency braking (AEB):** Often paired with FCW, this feature applies the brakes automatically when the vehicle senses a possibility of a collision in front of the vehicle.
- **Pedestrian automatic braking:** It detects a pedestrian crossing in front of the vehicle and warns the driver. It applies brakes automatically if a collision is imminent.
- **Adaptive lighting:** It automatically switches your vehicle's headlights to the lower beam when an oncoming vehicle approaches and back to the high beam when it passes.

### Lane change and blind spots

- **Lane departure warning:** It alerts the driver when they are drifting out of their lane of traffic. Typically, it doesn't alert if the driver has turned on a blinker.
- **Active lane keeping:** It provides corrective steering and braking to keep the vehicle in the current lane if the driver is not intentionally changing lanes.
- **Lane centering assist:** It provides continual steering to keep the vehicle centered in its lane.
- **Blind spot detection:** It warns of a vehicle in the driver's blind spot. It may only trigger when the blinker is activated, or the driver turns the steering wheel to change lanes.

### Backing and parking

- **Rear view video or backup camera:** It provides the driver with a clear view directly behind the vehicle when clean.
- **Rear automatic braking:** It detects a potential rear collision and automatically engages the brakes if a crash is imminent.
- **Rear cross traffic alert:** It warns the driver of potential rear collisions that may be outside the view of the backup camera.

### References

<sup>1</sup> "Real-world benefits of crash avoidance technologies," Insurance Institute for Highway Safety and the Highway Loss Data Institute, [iihs.org](https://www.iihs.org) (July 2023).

<sup>2</sup> "Analysis of the Field Effectiveness of General Motors Production Active Safety and Advanced Headlighting Systems," University of Michigan Transportation Research Institute (September 2019).

A Truck Operator's Guide to Advanced Driver Assistance Systems, Federal Motor Carrier Safety Administration  
NHTSA and FMCSA propose new safety standard requiring automatic emergency braking systems in heavy vehicles, National Highway Traffic Safety Administration, June 2023.



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