Autonomous Emergency Braking

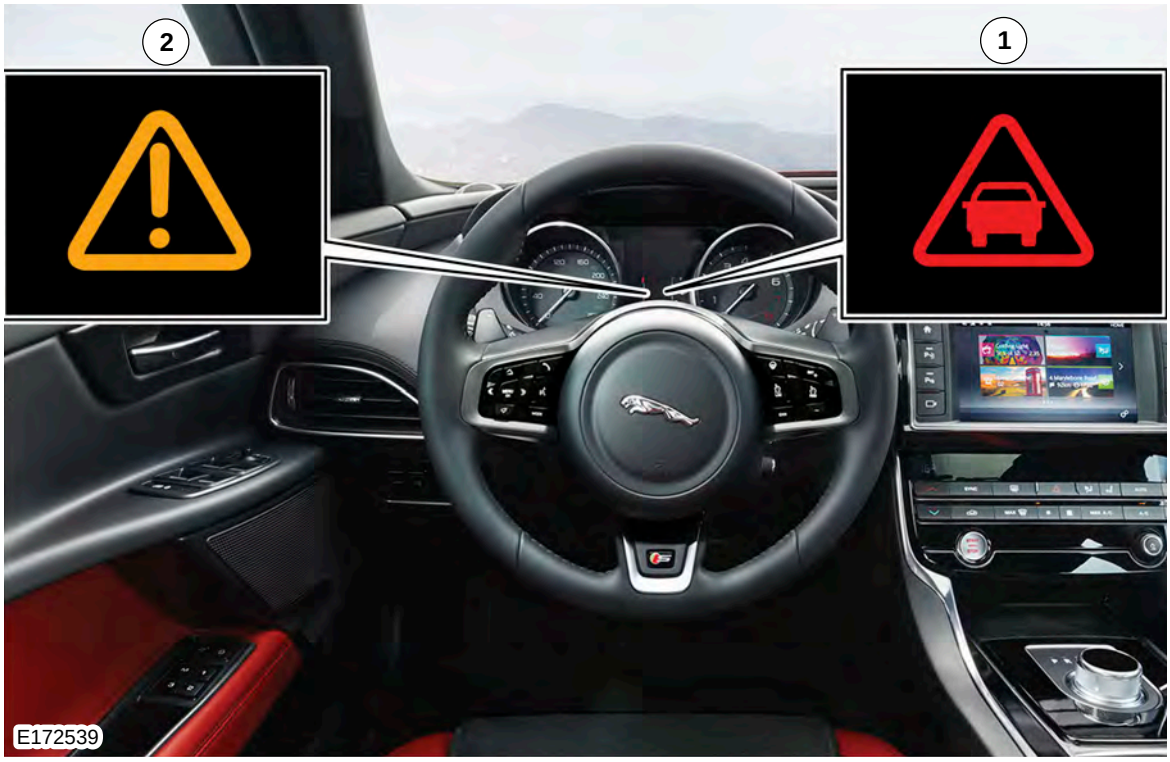
Autonomous Emergency Braking (AEB) is a safety system designed to reduce the chances of an impact or reduce the impact effects if a collision is imminent. It is an updated version of the Intelligent Emergency Braking (IEB) system.

AEB uses the ABS system on the vehicle and an Image Processing Control Module fitted to the rear view mirror to gather information about possible collisions with static or mobile hazards. This information can then be used to avoid or reduce the effects of the collision depending on vehicle and road conditions.

The system also monitors driver inputs using the relevant control modules and networks to determine the intervention required.

NOTE: Autonomous Emergency Braking became compulsory in 2014 for any vehicle manufacturer to achieve a 5 star Euro NCAP rating.

AEB Warnings (16MY XE Shown; XF Similar)



Item	Description
1	Warns the driver of a potential collision
2	Indicates an Autonomous Emergency Braking event took place

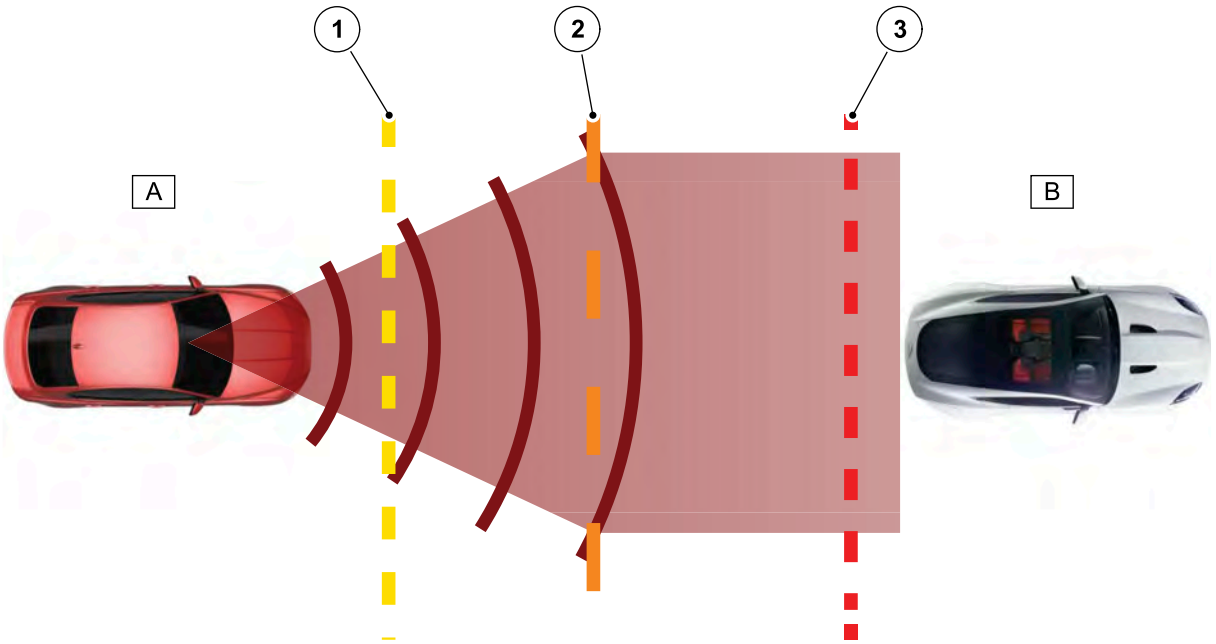
The Image Processing Control Module (IPM) monitors the road ahead for possible collisions. If detected, a warning informs the driver of a collision risk concerning the vehicle ahead, providing the driver with an opportunity to avoid the situation by braking or steering. If the driver does not react, the AEB system applies full braking, with the aim to avoid or limit the collision impact velocity.

The IPM provides data to perform the following functions:

- Audible collision risk warning to the driver
- Activates a visual driver warning red triangle when travelling over 18 mph (30km/h)

The red triangle indicates the need to apply the brakes to avoid collision, dependent on road and vehicle conditions. The braking system is automatically applied.

Post intervention, the system provides a confirmation message of a yellow triangle to the driver confirming an intervention took place.



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Item	Description	Item	Description
A	Host Vehicle	2	Brake support: Pre-charge
B	Target Vehicle	3	Full authority AEB
1	Forward alert warning: visual and audible warning		

The system functions as follows:

Driver Warning
Before braking is engaged, when the vehicle is travelling faster than 30 km/h (18 mph), an audible warning is sounded and a visual warning is displayed in the instrument cluster, indicating that a collision risk has been identified, but is still avoidable by the driver. The visual warning message is also displayed by the Head Up Display (HUD) if equipped.

Brake Pre-Charge
If the time until collision becomes shorter, but still avoidable, the system applies a small amount of pressure on the brakes to fill the gap between the pads and discs, ensuring the best braking performance.

Collision Velocity Reduction
Having identified a collision risk, either static or travelling in the same direction, the function will apply the brakes, reducing the risk of the collision.

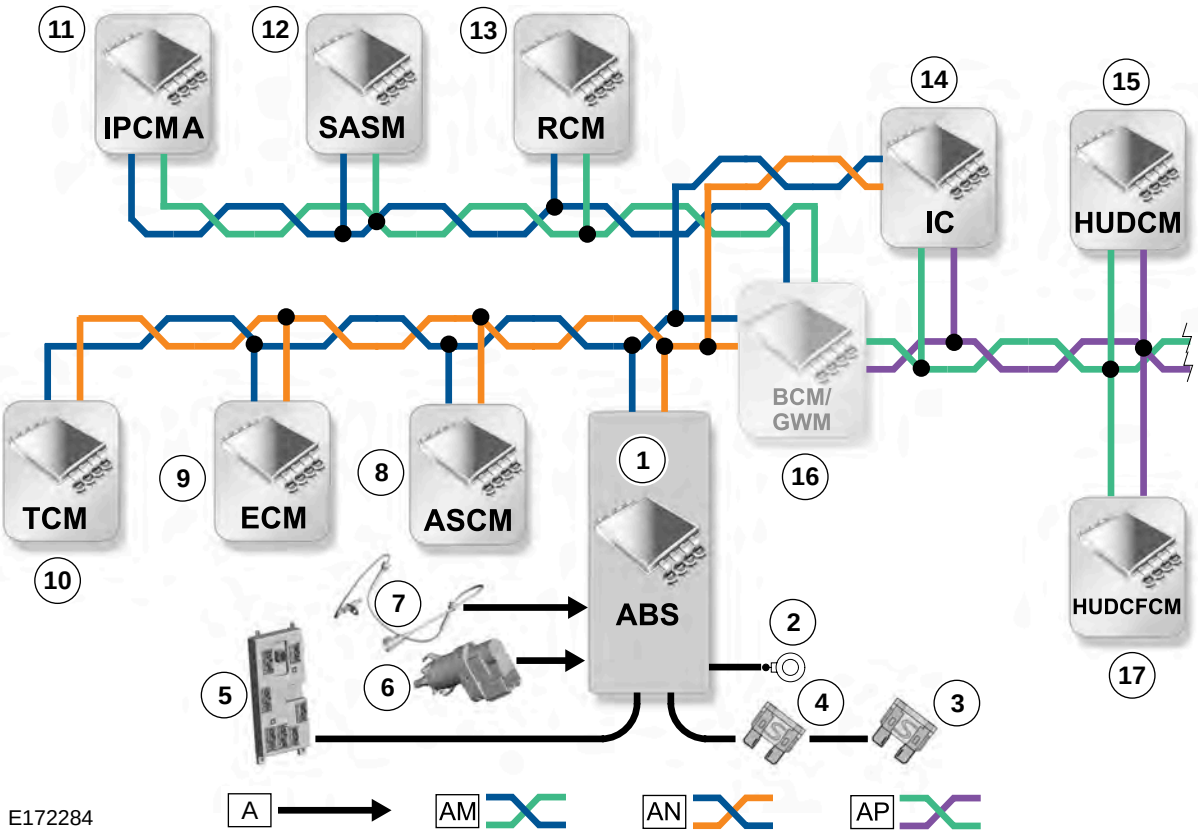
The operational speed range is between 3 – 50 mph (5 – 80 km/h). The instrument cluster displays a message to confirm that the AEB function has been activated (yellow triangle warning).

Autonomous Emergency Braking (AEB) can be disabled / enabled via the instrument cluster menu. AEB is only enabled when the vehicle is in forward motion. The driver always has the ability to override the system via steering or accelerating.

The system has the following limitations and will not operate in the following conditions:

- Poor camera visibility
- Fog, heavy precipitation, soiled windshield, etc.
- System fault detected
- AEB velocity outside range: 3 – 50 mph (5 – 80 km/h)
- Dynamic Stability Control (DSC) is switched off
- The vehicle is cornering sharply

Autonomous Emergency Braking Control Diagram



Item	Description	Item	Description
1	Anti-Lock Brake System Control Module	12	Steering Angle Sensor Module
2	Ground	13	Restraints Control Module
3	Fuse	14	Instrument Cluster
4	Fuse	15	Head Up Display Control Module (Optional)
5	Body Control Module/Gateway Module	16	Body Control Module/Gateway Module
6	Brake Pedal Switch	17	Head Up Display Cooling Fan Control Module
7	Wheel Speed Sensors	A	Hardwired
8	Adaptive Speed Control Module (Optional)	AM	Chassis HS CAN
9	Engine Control Module	AN	Powertrain HS CAN
10	Transmission Control Module	AP	Comfort HS CAN
11	Image Processing Module		