OCTOBER 2024

FACT SHEET

PROGRESSION OF AUTOMATIC EMERGENCY BRAKING

Key Findings:

- ***Old model vehicles*** [2017 – 2018] with AEB were evaluated at speeds of 12 mph, 25 mph, and 35 mph, consisting of 5 test runs per speed increment: **Old model vehicles avoided collisions 51% of the time.**
- ***New model vehicles*** [2024] with AEB were evaluated at speeds of 12 mph, 25 mph, and 35 mph, consisting of 5 test runs per speed increment: **New model vehicles avoided collisions 100% of the time.**

Background:

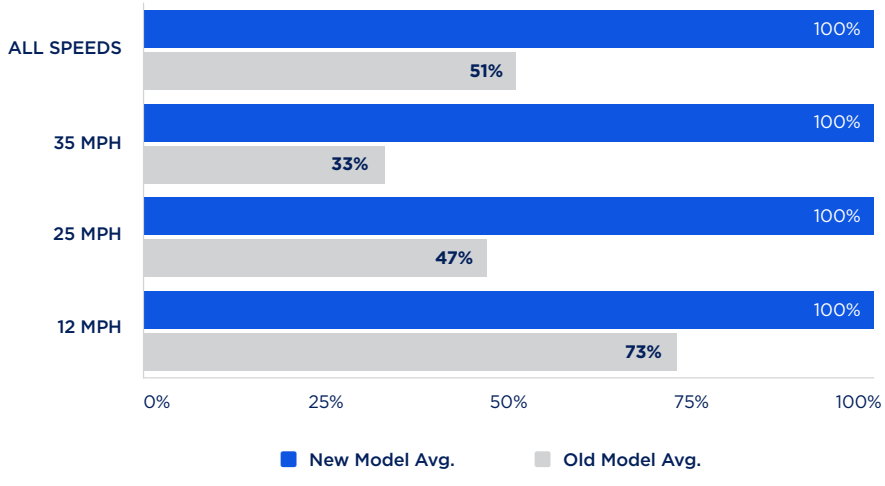
Automatic Emergency Braking (AEB) is an advanced driver assistance system (ADAS) that utilizes sensors to detect imminent forward collisions with vehicles or other obstacles. When a potential collision could occur, and driver response is deemed insufficient, AEB will automatically apply braking pressure to slow the vehicle or bring it to a complete stop, mitigating the severity of the impact or potentially avoiding the collision altogether. AEB's design primarily addresses forward-motion, low-speed rear-end collisions.

To assess the progression made by automakers in these systems and how drivers can effectively use them, AAA, in partnership with the Automobile Club of Southern California's Automotive Research Center, conducted primary research using six test vehicles equipped with AEB technology. Three old (2017 – 2018) and three new (2024) vehicles of the same make and model were evaluated.

To better understand the capabilities and limitations of AEB systems, AAA pursued this inquiry:

1. Has the performance and functionality of automatic emergency braking systems (new) improved compared to the previous generation of technology?

Collisions Avoided by Vehicle Age Group



Overall Results:

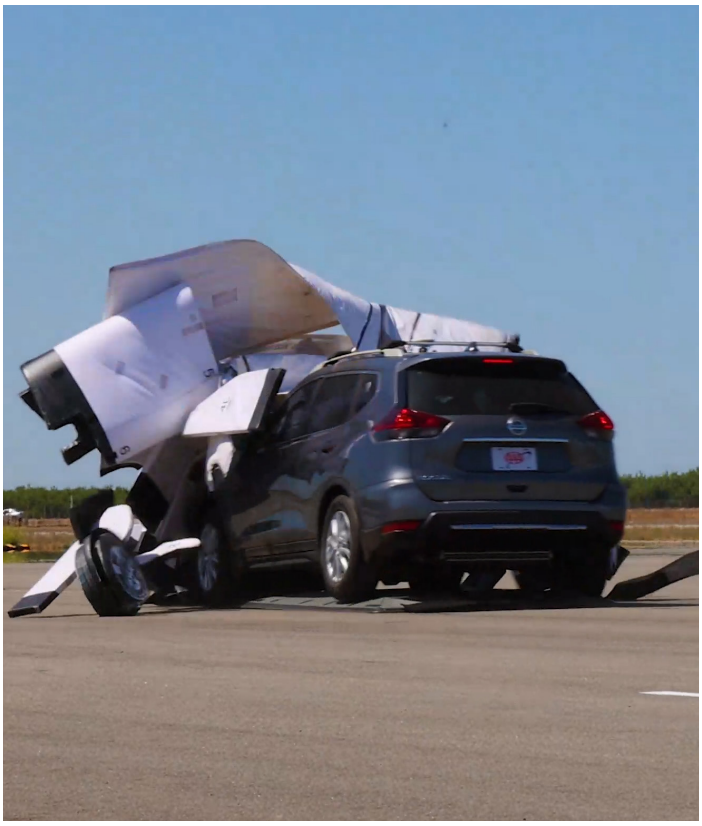
New model vehicles (2024) tested were nearly twice as likely to **avoid a collision** as old model vehicles (2017 – 2018) when tested at speeds up to 35 mph.

Higher Speeds (45 mph and above):

According to data collected by the Federal Highway Administration, a majority of total miles driven in the U.S. occurs at higher speeds (above 35 mph). AAA engineers added test scenarios to assess the limits of current AEB systems at higher speeds.

When AEB systems were tested up to 45 mph, most test vehicles alerted the driver with FCW (forward collision warning) and avoided a collision with the target. When speeds were increased to 55 mph, collisions occurred 100% of the time.

To view the full report, click HERE.



Recommendations:

Drivers:

- The progression of these systems is improving and performing as intended. Having these systems in your vehicle can help prevent collisions.
- Never rely solely on technology to apply the brakes. Automatic emergency braking systems are not a replacement for an attentive driver.
- Be aware of the limitations of an AEB system and stay engaged while driving. Maintain focus, even when driving vehicles equipped with advanced safety features.
- Engaging in risky driving behaviors such as speeding, texting, driving while drowsy or distracted, or driving under the influence of cannabis or alcohol significantly increases the risk of a collision. Remember to stay alert! Follow speed limits, keep your smartphone out of reach, and only drive when sober.

Industry Advice:

- **Continued development of Advanced AEB Systems:** Automakers should prioritize developing AEB systems for high-speed scenarios.
- **Enhance Forward Collision Warning Alerts:** If FCW systems offer earlier alerts, they can provide drivers with additional reaction time, decreasing the sole reliance on AEB systems. This approach can establish a more cooperative safety mechanism where both the driver and the vehicle collaborate to prevent collisions.
- **Research and Development for High-Speed Scenarios:** Ongoing investment in research and development is crucial for improving the effectiveness of AEB systems at higher speeds. This involves advancing sensor technologies, optimizing braking algorithms to minimize false positives, and undertaking comprehensive real-world testing to meet updated regulatory requirements and guarantee safety at higher speeds.

Methodology:

In partnership with the Automobile Club of Southern California's Automotive Research Center, AAA tested Early and Late model vehicles from the same automaker evaluated back-to-back on the same day to eliminate any testing bias. Vehicles were driven on a closed-course roadway with a DRI Soft Car 360® positioned at the end of the course with the rear facing the subject vehicle. The roadway provided a minimum of 2,000 feet of runway to stabilize test speeds for over 30 seconds. The driver was instructed not to apply the brakes, relying on the activation of the (AEB) system to slow or stop the vehicle. A pedal load cell was mounted on the brake pedal to detect any instances where the driver applied the brakes. After each test run, vehicles underwent a key-on cycle to ensure readiness for the next test run.

Standardized AEB testing speeds were as follows:

- 12 mph (+/− 1 mph): 5 test runs
- 25 mph (+/− 1 mph): 5 test runs
- 35 mph (+/− 1 mph): 5 test runs

Higher AEB testing speeds consistent.

- 45 mph (+/− 1 mph): 5 test runs
- 55 mph (+/− 1 mph): 5 test runs

Subject vehicles:

- 2017 Jeep Cherokee
- 2024 Jeep Cherokee
- 2018 Nissan Rogue
- 2024 Nissan Rogue
- 2018 Subaru Outback
- 2024 Subaru Outback

ADAS penetration data published by SBD Automotive in the 2023 ADAS USA guide was used to define a list of vehicle models with AEB fitted as standard. For consistency of size and form factor, all test vehicles would be mid-sized SUVs due to the segment's popularity as determined by vehicles in operation and the availability of models with appropriate AEB systems fitted. To ensure the selection of a previous generation of the technology, AAA reviewed data from multiple years of SBD Automotive's ADAS Guide. The 2017–2018 model vehicles would meet the testing requirements for the ***old model*** vehicles and the 2024 model year vehicles were utilized for ***new model*** vehicle set.