AUTOMOTIVE ENGINEERING

FACT SHEET

REAR CROSS TRAFFIC ALERT SYSTEMS

BACKGROUND & METHODOLOGY

Rear cross traffic alert (RCTA) systems are an advanced driver assistance system that utilizes radar technology and a combination of audible, visual, and haptic alerts to assist a driver when backing out of parking spot. This feature is becoming more prevalent in new vehicles, as it typically uses the same physical sensor that is used for blind spot monitoring systems, one of the most popular driver assistance technologies in the marketplace.

As automakers increasingly add this technology into today's vehicles, AAA engineers conducted primary research to better understand the limitations of RCTA systems when used in a real-world setting. In parking lots, particularly near schools and shopping centers, vehicles are often parked between two large family vehicles, such as SUVs or minivans. In these scenarios, AAA found that RCTA sensors can become partially blocked, resulting in reduced functionality of the systems.

To understand the potential limitations of rear cross traffic alert systems, AAA pursued one main line of inquiry:

- **How well do rear cross traffic alert systems detect an approaching vehicle, motorcycle, bicycle or pedestrian when parked between two large SUVs?**

KEY FINDINGS

The effectiveness of rear cross traffic alert (RCTA) systems varied significantly among test vehicles. While some vehicles performed well in all scenarios, others failed to detect approaching vehicles, bicyclists, motorcyclists and pedestrians.

While RCTA systems functioned well when not blocked by adjacent vehicles, this does not reflect real world conditions. **When parked between two large vehicles, the effectiveness of the RCTA systems was greatly impacted:**

- A passing motorcycle was not detected by the systems in 48 percent of tests.
- The systems failed to detect a bicycle passing behind the vehicle 40 percent of the time.
- The systems failed to detect a passing vehicle 30 percent of the time.
- While not all systems are designed to detect pedestrians, the technology failed to detect pedestrians 60 percent of the time.

Ranging from standard equipment to an optional feature, **RCTA systems are available on 38 percent of 2015 model year vehicles**. Technology packages that include this feature range in price from $600 to more than $9,000. The average cost for this feature is approximately $2,373 on 2015 MY vehicles.

When it comes to parking, American driving habits do not align with expert recommendations:

- **Only 11.6 percent of U.S. adult drivers back into a parking space all or most of the time.** Another 12.8 percent do so frequently. Conversely, 75.6 percent of drivers don't frequently back into a parking space.
- **About one half (54%) of U.S. adult drivers rarely or never back into a parking space**, while an additional 22% only do so sometimes.
- **Men are more likely to back into parking spaces** (31%) than women (18%) at least frequently.

METHODOLOGY

The AAA engineering team set up a closed course test to evaluate rear cross traffic alert (RCTA) systems in a repeatable and controlled environment. The test vehicles were positioned in between two large SUVs to replicate a real-world scenario where the driver's peripheral vision is blocked.

In order to accurately measure the vehicle-to-vehicle separation distances, time-to-collision and approaching speeds, a high precision Racelogic GPS data acquisition system was used. The system has 2cm accuracy between the subject and target vehicles that enables real-time measurement of the rear cross traffic system alerts. The high-precision GPS data was imported into Racelogic Video Vbox system that featuring multiple cameras with video/data overlay.

RCTA systems on five test vehicles were evaluated for accuracy in detecting a passing vehicle, motorcycle, bicyclist and pedestrian. To ensure accuracy and repeatability in the data, each test scenario was repeated five times.

Measurements:

- Vehicle separation distance on recognition (feet), both Lateral and Longitudinal
- Time-to-collision (sec)
- Missed detections
- False positive detections

Approaching Targets:

- Mid-size sedan
- Motorcycle
- Bicycle
- Pedestrian

AAA RECOMMENDATIONS

If car shopping, a vehicle equipped with a rear cross traffic alert system may boost rear visibility, but should not be relied on to prevent crashes.

Even if your vehicle is equipped with a rear cross traffic alert system, always reverse slowly, turning and checking blind spots to verify that a vehicle, bicyclist or pedestrian is not approaching the vehicle.

Owners of a vehicle equipped with a rear cross traffic alert system should understand system limitations before using the feature. In AAA's testing, system accuracy varied widely among vehicles.

Whenever possible, reverse into a parking space. Driving forward out of a parking space increases driver visibility and lessens the likelihood of a crash. Backing into a parking space is an AAA Driver Training best practice.

HOW TO REVERSE INTO A PARKING SPACE

- Locate a space large enough for you to safely back into.
- Signal to the spot you are backing into. This will let other drivers and pedestrians know what you intend to do.
- Slowly roll forward until your shoulder is centered in front of the space you wish to back in.
- Turn the wheels in the opposite direction of your selected parking space and roll out to approximately a 45° angle and stop.
- Put the vehicle in reverse.
- Turn the wheels in the opposite direction and slowly start backing into your space.
- Once the vehicle is straight in the space, stop and straighten the wheels.
- Continue to slowly back in. You have reached the rearward parking boundary when the curb or painted line appears to bisect the rear window.