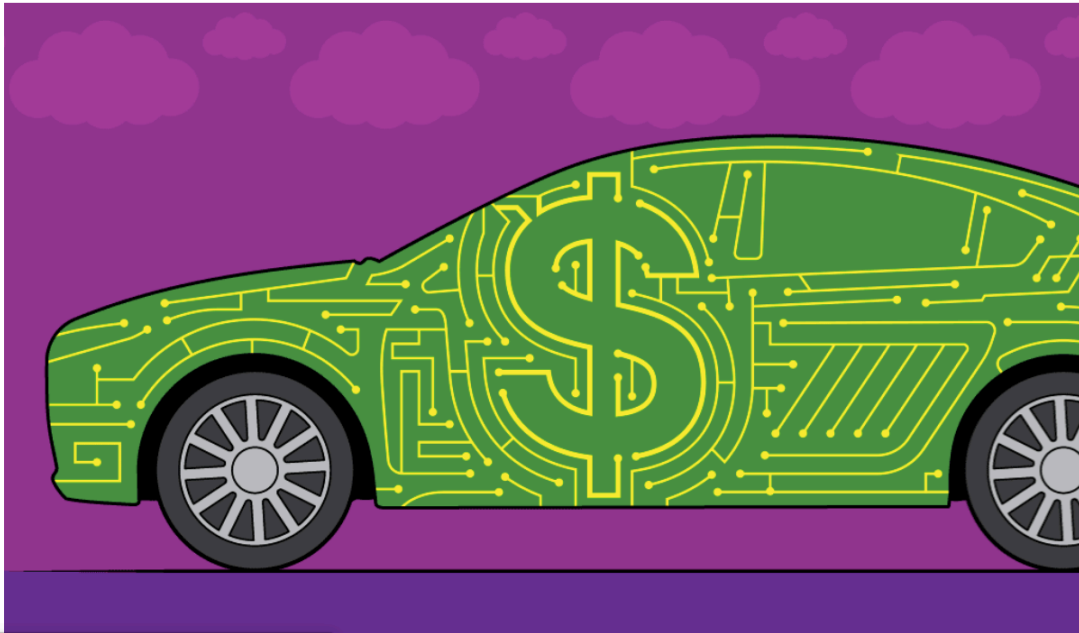


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WHEELS

When the Windshield Helps Drive the Car, a Repair Isn't So Simple



Fixing a cracked windshield used to be the kind of repair a technician could perform in a few minutes in your office parking lot while you were at work. Today, the same repair could take hours and require expensive computerized equipment in a special facility. And it will probably cost much more. If the repair is not done properly, it could have dire consequences.

In this new world of advanced driver assistance systems, features like lane-keeping assistance, automatic emergency braking and collision avoidance are integrated with windshields. They can prevent horrific accidents and save lives, according to the Insurance Institute for Highway Safety, but they also involve a complex suite of sensitive components, including ultrasonic, radar and video sensors.

Cameras nestled behind the windshield, radar sensors hidden in the front grille and ultrasonic components embedded in bumpers work within narrow tolerances. A seemingly minor impact can knock them out of alignment. And as vehicles — and drivers — rely on these systems more and more, tuning these components properly can be a life-or-death matter.

A camera that hasn't been recalibrated after a windshield repair, for example, could mean the difference between keeping you between the lines or steering you off a cliff.

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“It can be very complicated,” said Mike Calkins of AAA, the automotive group. “With radar and video, typically you need to do a wheel alignment before you do a calibration, because it needs to

be pointed straight down the road.” That’s an extra step that wasn’t previously part of a windshield replacement.

The driver-assistance systems may also require so-called static recalibration using custom laser and targeting equipment in a specially configured garage.

Many repair shops use Bosch’s DAS 1000 calibration equipment. Cars are aligned using a complex system involving lasers that requires proper lighting and an open, level area free of interference. Certain cars from Fiat Chrysler, Honda and Toyota require such static calibration, with each model using different measurements — even if the cars use the same camera systems — according to Edward Sprigler, a vice president at Safelite Autoglass.

At a Safelite repair center in the Astoria section of Queens, the company had to install high-output LED lighting overhead to accommodate the new technology.

“It’s about brightness and eliminating shadows so that the camera can see,” said Errol Webley, the Safelite quality manager for the New York and Long Island area.

The Bosch equipment also uses green lasers to bisect the car and create virtual lanes for the vehicle. Even the pitch of the windshield glass has to be perfect; otherwise, the sensors may look too far down the road and brake the car prematurely even when there’s no danger of a collision, Mr. Webley said.

Some models may specify that recalibration be done with a full tank of gas (to account for the precise height of the vehicle). Others require recalibration even after such seemingly minor adjustments as changing the wheel sizes on your car, Mr. Calkins said.

Still other vehicles, including cars from Ford, General Motors and Dodge, require what is known as dynamic recalibration, meaning the vehicle has to be test-driven according to very specific parameters.

“The repair facility may drive it 25 miles,” said Richard Beckwith, senior manager at Allstate’s Tech-Cor applied research and collision repair center. “It’s not for a joy ride but just to recalibrate the lane-departure warning system.”

Mr. Webley demonstrated the process on city roads and highways. Using a scanning computer plugged into an S.U.V.’s onboard diagnostic port, we had to drive on roads with clearly marked lanes, not an easy assignment around New York City. The vehicle also had to be driven at over 50 m.p.h. for at least 20 minutes — in clear weather — enough time for the sensing system to confirm that it was correctly calibrated.

Some cars, like certain model years from Honda and Mercedes-Benz, require both static and dynamic recalibration, adding an hour or two of testing to a typical repair. That, plus the added cost of the components, has raised the price of repairs after a simple fender bender, according to AAA.

Replacing a cracked or chipped windshield, for example, in a car with automatic emergency braking, adaptive cruise control and lane-departure warning systems could cost as much as \$1,600. Furthermore, many cars are now bristling with embedded ultrasonic and radar sensors. So a relatively minor driving misjudgment that damages a side mirror and rear bumper could require fixing rear radar sensors used with blind-spot monitoring and rear cross-traffic alert systems. The price? As high as \$2,050†

Even tapping a curb and putting a car out of alignment could require a \$300 adjustment to make sure the driver-assistance system is still operating properly, Mr. Calkins of AAA said.

Consequently, Mr. Calkins recommends that new car buyers take two important steps: Check their insurance deductible so that they can cover potential driver-assistance-system repairs, and understand what safety systems are in their new cars so that they can make sure any repairs include those systems as well.

Of course, driver-assistance systems are supposed to reduce the frequency of collisions, justifying the added expense, and hopefully avoiding costly repairs. A recent study by the Insurance Institute for Highway Safety of General Motors vehicles in 23 states found that models with auto-braking and forward-collision-warning systems had 43 percent fewer front-to-rear crashes reported to the police. It also found 64 percent fewer injuries from such collisions compared with similar models without the driver-assistance technology.

Moreover, the AAA Foundation for Traffic Safety estimates that assistance systems could prevent over 2.7 million accidents, 1.1 million injuries and nearly 9,500 deaths in the United States each year. The caveat: The driver-assistance systems would have to be in all vehicles on the road.

“The whole question in the industry is frequency” of preventing accidents, Mr. Beckwith at Allstate said, “but we’re dominated with vehicles that do not have this equipment on them now.”

“We field 15 million repair calls a year,” Mr. Sprigler at Safelite said. “Now, about 10 percent of these have ADAS.” Those percentages should go up in the future given that all the top automakers have voluntarily committed to making automatic emergency braking systems standard equipment in all vehicles by 2022.

Down the road, as more semiautonomous driver assistance packages are added, the complexity of such systems will increase, fusing together radar, camera, ultrasonic and lidar technologies. That will make repairs even more challenging, and consumer awareness of the technology even more important.

“Ultimately, if it’s not operating properly,” Mr. Beckwith warned, “it might not avoid an accident.”