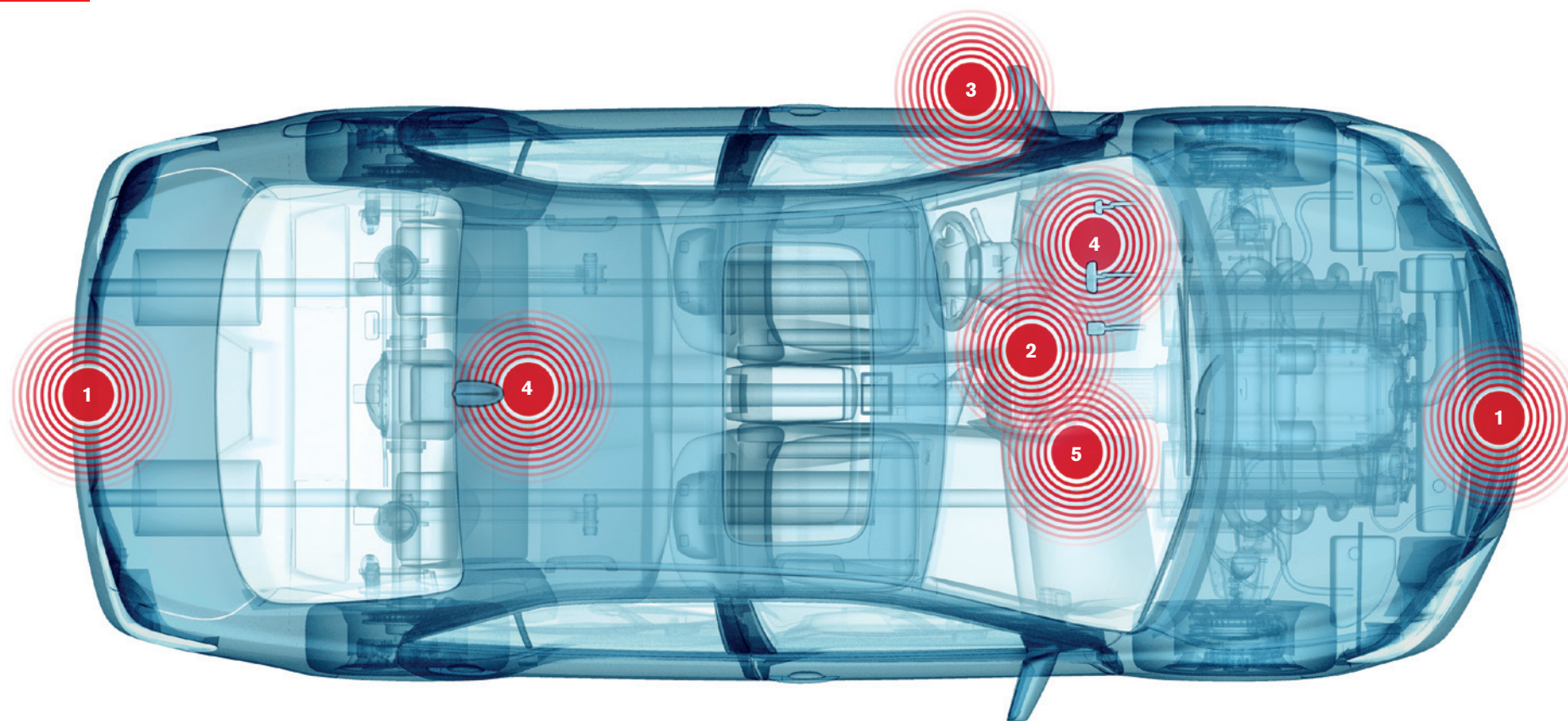


## RECIPE FOR RECALLS?

The 2010 Prius recall wasn't simply a braking problem; it was a software problem—and perhaps a harbinger of things to come. A decade ago, the average vehicle relied on a central internal computer to control everything from headlights to wipers to automatic rear lift gates. But cars today have as many as 80 microprocessors; luxury models may have 100. Some of this technology is merely convenient, giving drivers more control over entertainment and climate systems, but most of it is crucially important because these chips and software improve safety, performance, and fuel efficiency. But there's a downside: In 2007 carmakers recalled 1.2 million vehicles for software glitches, compared with 420,000 in 2003, according to research by Hughes Telematics, which makes electronics for cars. Here are five sophisticated technologies, each with the potential for recall-worthy problems.



### 1 ADAPTIVE CRUISE CONTROL

A refined version of the cruise control that has allowed drivers to set a desired speed since the 1950s, adaptive cruise control continuously monitors traffic and adjusts the throttle and brakes to match other cars' speed and maintain a safe distance from the car ahead. A microwave unit or laser often mounted behind the grille scans traffic and feeds the information to an onboard computer to warn the driver or even slow the car down.

### 2 DRIVE BY WIRE

Most new cars employ this technology, which measures how much oomph the driver wants by reading the position of the pedal and then tells the engine how much to power up. The software boosts mpg by controlling fuel use, but has recently been implicated in lawsuits against Toyota. The plaintiffs allege that an electronic malfunction caused cars to surge forward regardless of what the driver did. Toyota denies that electronics are the problem.

### 3 BLIND SPOT ALERT

When sensors embedded in the side of the rear bumpers detect vehicles in a driver's blind spot, a light flashes in the mirror or an alarm beeps inside the car. The technology is generally offered as an option on luxury vehicles such as the Volvo XC90 and is making its way into mainstream models like the Ford Taurus. It's one of those technologies that can make for lazy drivers. Is looking over your shoulder really such a pain in the neck?

### 4 TIME FOR AN UPGRADE

After drivers take their cars in for tune-ups or repairs, the technician connects a diagnostic device to a port under the dashboard. Besides calculating what's wrong with the car, the computer uploads the latest software, just like your home PC does. The software makers want to send upgrades automatically to the car via satellite, but car companies want to maintain control, arguing that only their trained technicians can ensure that the software has been installed correctly.

### 5 THAT'S ENTERTAINMENT

Advances like Ford's Sync infotainment system, which can download music or access tunes in the driver's onboard library by voice command, and add-ons such as Chrysler's satellite TV for rear passengers, bring even more computing power to cars. As the industry catches up with demand and links music downloads to the dashboard, the chips and software will keep piling up. And the more cool gizmos your car has, the more chances you have for something to go haywire.