With so much technology in cars, why can't the screen show me what the check engine light means?

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The dashboard of an Audi A4 during a demonstration of Audi's vehicle-to-infrastructure technology on Dec. 6, 2016, in Las Vegas.

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An illuminated "check engine" light on your vehicle's dashboard can ruin your plans or, at the very least, cause doubt about the road worthiness of your car.

It usually means a trip to the dealer for a diagnostic test that can cost more than $100. For that, a technician will plug your car into their computer to read the error codes. Sometimes, the problem may be something simple and easy for a driver to fix, like a loose gas cap. Other times, the light could be warning of a costly repair.

Which got me to wondering: With infotainment systems becoming more advanced, why isn't there an app or user-friendly diagnostic tool to tell you on

the large screen what's wrong with your car, potentially saving you time and money? Or is this all just a conspiracy to force drivers to go to mechanics or dealers?

As it turns out, cars have the ability to tell you what's wrong with them and they've had it for a long time. But the system is not intended for the general public because specialized equipment is required to read the information stored within a car's computer and it's often encoded.

Since 1996, all cars and light trucks sold in the United States and Canada have an on-board diagnostics (OBD) connector under the dashboard. It's a 16-pin connector that you can plug a code reader or diagnostic tool into. This is the port that technicians use to read the codes stored in the car's computer. You can buy a cheap code reader online and it will retrieve the codes, which you can then Google to find out what they mean.

But knowing what a code means doesn't always mean you'll understand the true nature of the problem.

"A code is perhaps 10 per cent of the process," says mechanic Lou Trottier, a Globe Drive contributor and owner-operator of All About Imports in Mississauga. "You can buy a code reader on Amazon for $69 but the one I use on a daily basis was $14,000."

He illustrates the difference between scanners with this story: A client came in last year with a 2016 Audi A4, a car known for having timing chain issues. A timing chain replacement can cost as much as $3,000, but the error codes on the car were related to the camshaft sensor. So the client decides to hold off on the repair and goes home and Googles the codes and concludes that replacing the camshaft sensor should do the trick.

"He buys the sensor, plunks it in and is feeling pretty good about himself," Trottier says. "But sure enough, the [engine] light comes back on and he decides he's just going to get it home. But the timing chain fails and the engine's internal components collide and he turns a $2,000 or $3,000 repair into a $7,000 or $8,000 repair because he looked up that code."

Another Audi A4 sitting in Trottier's shop when we spoke was showing the same codes as the other one, also related to the camshaft. From his experience with these cars, he feared a timing chain failure was imminent.

“I don’t even want to run it because I’m afraid of it breaking while I’m working on the car,” he says.

Many cheaper code readers can reset or turn off your check-engine light, usually only temporarily, but few have two-way communication with the vehicle’s computers or the ability to run tests. Trottier’s $14,000 diagnostic tool can plug into a car and initiate a “camshaft phaser examination test,” giving him a better picture of what’s happening internally. “Without the experience of knowing what to do with the results of the test, giving that information to a consumer might be a liability,” he says.

Trottier’s scanner allows him to read more than just trouble codes. By plugging into the vehicle’s CAN bus system, it can gain access to all the various modules in a car. CAN bus, which refers to the Controller-Area Network and the wires that connect it, is the communications system inside a car that ties together all the different modules or electronic control units (ECUs). A modern car can have 50 or more of these modules that include things like the engine control unit, audio system and the airbags.

Just like our nervous system ties together all the different parts of our body, the CAN bus network does the same with ECUs. It allows all of them to communicate with each other while giving priority to the most important ones like the drive units. Prior to CAN bus, the various components in a car were connected with point-to-point wiring and it required miles of heavy wire as cars became increasingly complex.

Setting aside liability issues, it may be technically possible to integrate a simple code reader into a car’s infotainment system but displaying anything more complex, like what is found on expensive code readers and what is truly required to know the issue, would make little sense to the average driver.

“A scan tool might get me in 70 per cent of the way; the [Amazon] code reader only 10, if you’re lucky,” Trottier says. “There is no aftermarket or manufacturer level tool that’s going to get into every component and be able to identify if it’s bad or not. [Modern] cars are too complex and they have too many components. The files that would have to be built into the scan tool would be massive.”

Manufacturers are also encoding their software, making it increasingly difficult to access and they say they have good reason to do it. People can reprogram

modules and bypass emission systems to increase engine power or even get a louder exhaust, sometimes voiding the warranty in the process. Technicians can access the software after paying hefty subscription fees to the manufacturer. Unlike OBD-II, there is no standard universally used language among companies. Every automaker has its own version, which requires its own expensive software.

“A cheap scanner you can buy on Amazon does not contain legitimate data from the manufacturer. It’s been reverse-engineered to bypass paying the manufacturer,” Trottier says. “I have to buy the software from BMW Canada, for example, and then I have to buy a pass-through device, which is a component in between the car and my laptop that converts it into a different language to be able to use the BMW software.”

Having the latest diagnostic tools is a big expense for independent shops like All About Imports, but diagnosing some of the more complex issues would be impossible without them or the experience of knowing what to do with the information they provide. While a code reader can technically tell you what component is malfunctioning, it’s often just a clue and not the full diagnosis, as the Audi driver found out. Getting your codes read by a knowledgeable technician is usually the most cost-effective strategy when it comes to error codes.

“When YouTube became a thing, I was asked if I was worried whether it would affect my industry and my answer was the same then: No,” Trottier says. “There are some great DIY skilled people out there and 60 to 70 per cent of the time they’ll be okay, but that other 30 per cent of the time they’re going to screw it up so bad that anything they saved is out the window.”

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OK, but I still think manufacturers could risk giving us more info than just an illuminated icon on the dash. It wouldn’t be that expensive since no reference info would be needed beyond that of the particular vehicle. Further, if I want to keep driving even if the “fuel tank temperature” monitor has become activated, the risk would be on me if I were to turn the indicator off (with my $69 reader from Amazon). My 2006 Duramax truck is “new enough” to have a “check engine light” feature and “old enough” to have monitors going wonky regularly. The truck is so (relatively) simple and amazingly durable—it will out-live and out-run me, maybe by wearing me down being so rough to ride in with few comforts—that I doubt that engine light every time it comes on. TJB