

# CAR SCIENCE



AN UNDER-THE-HOOD, BEHIND-THE-DASH  
LOOK AT HOW CARS WORK

RICHARD HAMMOND



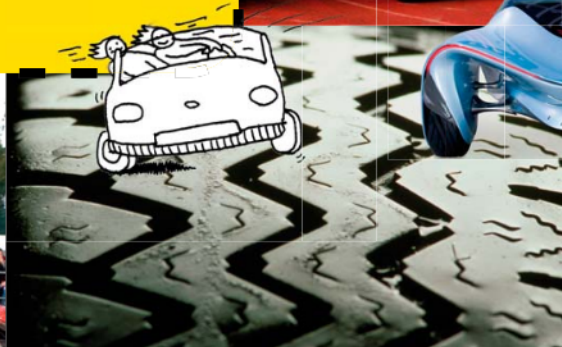
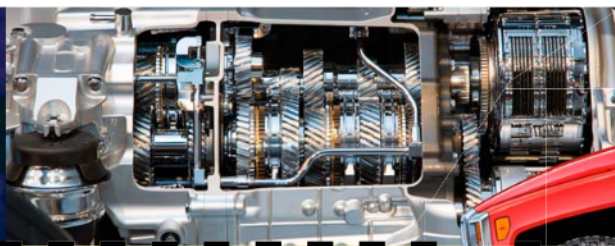
# CAR

## SCIENCE



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Consultants Dr. Jon Woodcock, Chris Woodford, Chris Longhurst

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# Introduction

**Cars are crammed full of science.** How fast they go, how quickly they can stop, and how furiously they can go around a corner are all down to science. And that's a good thing, because two things that I really love are cars and science. How convenient, two of my favorite things all in one.

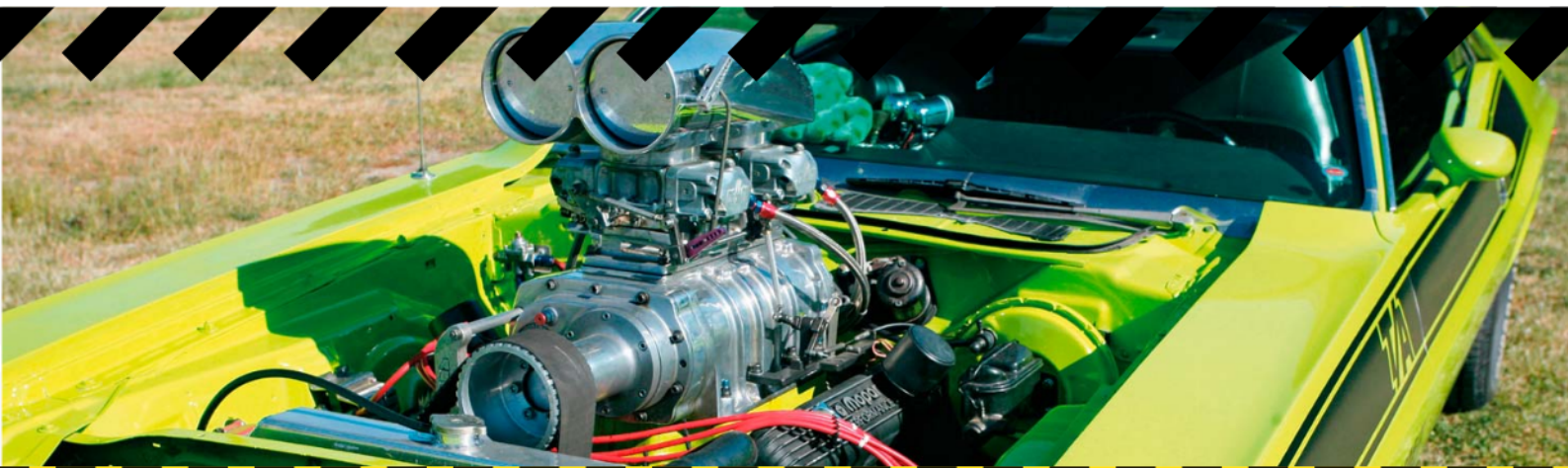
I know people who can tell the difference between a 1985 and 1986 Ford Fiesta from 500 yards in a snowstorm and who can remember the part number for a 1965 Morris Minor handbrake cable, but what they can't explain to me is the difference between power and torque.

Things like this are very useful for us to know. Lewis Hamilton and his buddies in Formula 1 don't just drive their cars faster and faster until they crash and then remember to go a little bit slower the next time; they understand what makes their cars stick to the road like an octopus wearing velcro shoes on a carpet. And because they understand the science involved, they can help their engineers make the cars go even faster and, therefore, win races and become rich and famous.

Lots of people driving on the road don't really understand the science in their cars. If they did they wouldn't drive so close to the car in front on the highway because







they'd know about things like inertia and momentum, and would know that if the car in front stops dead they won't be able to stop in time. And if they knew a lot about the science of cars they'd know that stopping suddenly from 70 mph (110 km/h) involves a lot of forces. And tears and bruises.

It's a huge subject, so we've been very sensible and split this book into four chapters: Power, Speed, Handling, and Technology. Each chapter covers everything you need to know to be a real driving expert. How a turbocharger works, how gasoline is made; we'll look inside gearboxes and learn why a Formula 1 car's brakes glow pink when it's stopping. And at the end, we'll look at the kind of cars that we might be driving in the future.

Throughout the book we'll be meeting one of the world's first experts, Sir Isaac Newton (you can't miss him, he's an old-looking geezer with a crazy dress sense and a massive wig). Most of us know that one day an apple fell on Isaac's head and he realized that gravity existed, but he came up with lots of other brainy ideas and theories, too, most of which are very important to cars.

We know you'll learn a lot, and we hope you enjoy doing so.

*Richard Hammond*





