

Review by Dr. Edward M. Kasprzak, Milliken Research Associates, Inc.



I just finished reading "Think Fast". Two sentences in the Introduction are worth commenting on:

On Page 2 it says, "There are no mathematical equations...". This immediately irked me and I became very skeptical. Mathematical equations and graphs are the language of science/engineering, and in my opinion any book which covers "Fast Fundamentals" and "Fast Physics" needs to have them. I feared yet another book on racecar engineering filled with hand-waving, voodoo explanations and Mythbuster's-level "science".

My fears were unfounded. While it's true I don't recall seeing a single "=" sign in the entire book, it is also clear that Neil Roberts knows the equations and relationships. I was happily surprised to find myself identifying familiar vehicle dynamics, materials and aerodynamics equations/relationships just below the surface as I read the book. His comments either reflect them directly or can be inferred by examining the equations.

My challenge to FSAE students: As you read the book, ask yourself what the underlying equations and relationships are. Then answer yourself!! Give yourself a pat on the back if you know it and get ready to do some research if you don't know where it came from. While this book has the style of "light reading" it is in fact *very* dense. Neil has chosen his words with the care and accuracy of a high-quality professional engineer. The more you know about how cars work the more you'll be able to appreciate some of the subtleties in how he describes things.

On Page 3 it says, "I'm sure there are some things in here that you will disagree with." Given that this sentence lives half a page past the "no math" sentence, when I read it I was more than ready to disagree! Again, that skeptical approach was unnecessary. It's true that I found a few things that I disagree with based on my career experiences, but I found far less to disagree with here than the vast majority of books on this subject. There is a good reason for this--FSAE students take note:

The author's comments are grounded in a good understanding of racecar engineering. He knows the underlying equations and relationships, and he knows how to interpret them. He has done physical testing to support the theoretical basis and to access the more complicated areas where first principles are very difficult to apply. He has made intelligent use of data acquisition systems and computing power. He takes good notes and learns from the past. He balances being detail-oriented vs. keeping the bigger picture in mind. He recognizes and respects the assumptions and limits of analysis techniques. He appreciates the "human side" of engineering. And it's clear that he's passionate about racecar engineering and has never stopped learning or thinking about it.

FSAE students, do you want to do well in Design and have a reliable, good handling car? See the above paragraph. Do you want to be able to separate engineering reality from myth? See the above paragraph. Do you want to be a top-quality engineer in your post-student career? See the above paragraph.

Excellent book, Neil. There's a part of me that still wants to see the equations in there, but that would be a different kind of book....

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