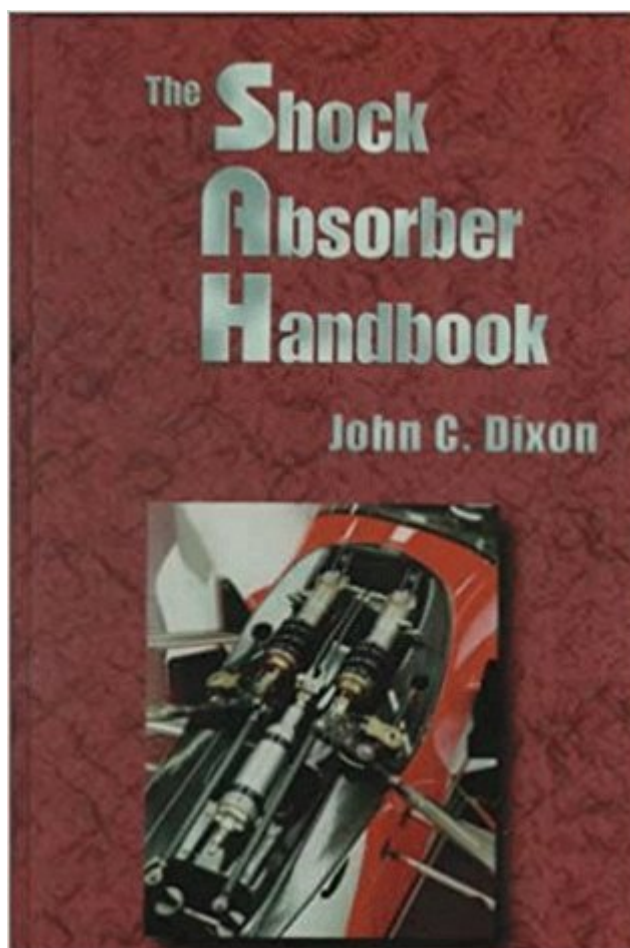


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# The Shock Absorber Handbook



## Synopsis

This book provides comprehensive coverage of the design, installation and use of the shock absorber. Among the subjects highlighted are fluid dynamics, valve characteristics, damper characteristics, installation and motion ratios, and influence on vehicle ride and handling. Numerous example installations are described and discussed. Testing machines, as well as methods of laboratory testing, are also described in detail. The widely varying characteristics of variable dampers, and the relationship to their design features, are explained. Chapters cover: Vibration Theory Ride and Handling Installation Fluid Mechanics Valve Design Damper Behavior Adjustables Specifying a Damper Testing

## Book Information

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## Customer Reviews

This is the best book ever written about shock absorbers. Although much have been written about dampers in the other books, nowhere the dampers have been covered so well as in this book, from design, construction, production, testing and using, to the analysis of ride-handling compromise. It covers the damper both as the unit per se, and as a small yet vital part of the whole complex vehicle system. Please note that the information in this book is mostly academical and abstract. It servers educational purposes excellent, but has little practical value for a beginning racer or automotive enthusiast. The chapter about damper testing covers mostly laboratory tests on special machines. The chapter about fluid mechanics analyzes different damper fluid properties, without reference to any specific particular fluid compound. The chapter about valve design lists various valve types,

characteristics and various theoretical models of valves. The chapter about adjustable damper enumerates the purposes of adjustment, classifies the dampers by the ease of adjustment, and gives different adjustable valve types. Having great theoretical value, the book however gives no advice for those people who would like to modify a damper manually by installing different kinds of valves, using another liquid, etc. Millikens in their wonderful volume "Race Car Vehicle Dynamics" have devoted 40 pages to dampers, but almost all on vehicle behavior, rather than damper design itself. "The Shock Absorber Handbook" reveals the problem of passenger comfort better than the Millikens' work. However, both of the books have similar style, both have hundreds of formulas and illustrations. I highly recommend it to anybody interested in the theory of vehicle dynamics.

The Shock Absorber Handbook is a good work, providing hundreds of formulas for computing load-dampening responses. Somewhat overly detailed on advanced theories, with strong references to hi-performance applications. It is the book you picture as a classic textbook for a college-level shock-design course. Chapter 1 gives a good basis in the history of the hydraulic dampener, from the initial start of friction snubbers to today's performance units. A good book to add to any shock design engineer's library. Product Design Engineer Arvin Meritor LVA - Export

At first view the book seems like a disappointment. Numerous equations, most of them rather complex. You feel that this is basically an academic book and has nothing to do with real and practical knowledge. But as you go deeper into the book you will soon realize that the content is going to be very helpful in a practical point of view. The book starts with pure vibration theory. Don't even think that this is something to ignore as it is so important to know the basic aspects of vibration theory in order to go deep in damper knowledge. You will find many important and interesting things for the real world, like transmissibility of the suspension, damping coefficient, damping ratio, damping factor and more. Also at Section 2.8 series stiffness is being discussed which is an extremely interesting subject in a practical point of view. Chapter 3 is maybe the most important chapter of the book describing in depth the theory of vehicle vibrations, ride, handling and most importantly you will learn a lot about ride handling compromise. Chapter 4 is about motion ratio, its effect in suspension behavior and also you will be so happy to be in a position to understand the basic differences in terms of geometry and behavior between double wishbones, mcpherson struts, rocker arm suspension, pushrod, pullrod and motorcycle forks and rear suspensions. Personally, I was excited to find out that in most cases there are not huge differences in behavior between a double wishbone and a strut suspension. Chapter 5 is all about fluid dynamics but as the author also

states, you must already have a level of knowledge on the topic in order to fully understand the stuff there. Chapter 6 is about valve design, valve types, valve characteristics and valve models. Chapter 7 will guide you through the damper behavior, it will talk about valve flow rates and the effect of these on damper behavior, damper parameters like damper symmetry and more. Chapter 8 discusses about the adjustable dampers and the effects of the various adjustments in the damper behavior. Chapter 9 will give you a guide on how to specify a damper. Chapter 10 is a very nice and practical chapter on damper testing. If I have a single complaint about this book is that it would be 100% perfect in the case it contained some colour real pictures of various types of dampers, damper internal components, various types of valves, etc. All in all, this is a book you cannot afford to lose if you are serious in dampers. I would like to see a more modern new edition though.

Do not buy this book if you want to tune the suspension of your race car, or if you are looking for brand-name recommendations. This is an engineering book, full of information that will be as true in 20 years as it was when the shock absorber (damper) was invented. But if you do read the book, you will be well equipped to read the data sheets and understand manufacturer's claims when doing those projects. The history of dampers is well presented here. A lot of thought has gotten us where we are; lots of old ideas that may again become new. The central theme is of the forces generated by a damper and how they can be controlled. The single most important concept is that simple hydraulic damping is governed by Bernoulli's principle, and that no amount of manual adjustment will keep it from being too soft on slow motions and too stiff on sharp motions. Much of the book describes the various progressive valving schemes used to correct this, which made the modern "self adjusting" damper available in the 50's. In some ways the book is too practical; the cutaways of used dampers add little. And I wish a deeper analysis was made of compliant (usually rubber) damper mountings, which are not just a necessary detail but an important part of the damper function.

Very technical book filled with formulae but still with pictures and a lot of reading, oriented more towards who studied mechanical engineering but useful to shine the light on many aspects.

A good and explanatory book about deadening and devices to be used besides the purpose about vehicles. Like the title proposes : hand book

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