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# How To Rebuild GM LS-Series Engines (S-A Design)



## Synopsis

With the increasing popularity of GM's LS-series engine family, many enthusiasts are ready to rebuild. *How to Rebuild GM LS-Series Engines* is the first book of its kind to help you rebuild your GM LS-series engine. It explains variations between the various LS-series engines and elaborates upon the features that make this engine family such an excellent design. In this special Workbench book, author Chris Werner uses more than 600 photos, charts, and illustrations to give simple step-by-step instructions on disassembly, cleaning, machining tips, pre-assembly fitting, and final assembly. This book gives considerations for both stock and performance rebuilds. The book guides you through both the easy and tricky procedures, showing you how to rebuild your engine and ensure it is working perfectly. The book also illustrates many of the performance components, accessories, and upgrades that have been developed for the LS-series family of engines. As with all Workbench titles, this book details and highlights special components, tools, chemicals, and other accessories needed to get the job done right, the first time. Appendices are packed full of valuable reference information, and the book includes a Work-Along Sheet to help you record vital statistics and measurements along the way. You'll even find tips that will help you save money without compromising top-notch results.

## Book Information

Paperback: 152 pages

Publisher: CarTech (May 14, 2008)

Language: English

ISBN-10: 193249460X

ISBN-13: 978-1932494600

Product Dimensions: 8.5 x 0.4 x 11 inches

Shipping Weight: 1.2 pounds (View shipping rates and policies)

Average Customer Review: 4.7 out of 5 stars [See all reviews](#) (59 customer reviews)

Best Sellers Rank: #92,053 in Books (See Top 100 in Books) #25 in [Books > Engineering & Transportation > Automotive > Repair & Maintenance > Engines & Transmissions](#) #90 in [Books > Engineering & Transportation > Transportation > Owner's Manuals & Maintenance Guides](#)

## Customer Reviews

The General Motors Generation Three Small-Block V8, the "LS1", debuted in the 1997 Vette. A Camaro version came in 1998 followed by three truck engines in Chevy and GMC full-sized pickups for 1999. Now, a decade later, with millions of engines manufactured, a growing number of Gen IIIs

in service may need overhauls and there's a certain part of the pool of those of interest to DIYs. That interest may be growing these days because of the country's current economic trauma forcing people to be cost conscious enough to consider rebuilding their own engine. That brings us to Chris Werner's, new book *How to Rebuild GM LS-Series Engines*. The second title of what I call Car Tech's "four volume set" on the LS series. Anyone who works on a Gen III, or its newer sibling, Gen IV, and is doing heavy engine work, needs this book. Even if you're not overhauling an LS motor, if you are into modern GM powertrain issues, a lot of the content in this title is valuable information. *How to Rebuild GM LS-Series Engines* is arranged in the Car Tech Workbook Series' usual format. It's divided into sections covering major parts of an engine overhaul, then subdivided into short articles discussing each step of the process. Sprinkled amongst that are sidebar stories on various important subjects. What we don't like about this format plagues many titles in Car Tech's "Workbook Series" and that is pictures which are too small. In an instructional book like this, pictures can be of more value than text in demonstrating to the beginning DIY how to perform a task. In reviewing this book, there are a number of occasions where I had to use a magnifying glass to see details in a picture illustrating a point made in the text. That is unacceptable and the only major problem which weakens this title's appeal. A portion of this book covers high-performance modification of Gen III/IV engines. Chris Werner told us via email that he wanted to continue the proven Car Tech "formula" of mixing some performance with basic rebuild information. Given the problem with itty-bitty photos, his publisher would have been better eliminating some of the performance discussion then use that space for larger, more useful pictures. Car Tech already has a good high-performance and racing LS-Series title in Will Handzel's outstanding *How to Build High-Performance LS1/LS6 V-8s* (SA Design), so readers wanting hi-po information could be steered to that book. Other than its tiny photos, Car Tech's "Workbook Series" format works quite well. The other notable deficiency of this book is its limited discussion of two characteristics in which the Gen III/IV engines differ from the traditional Small-Blocks and just about every other GM engine prior to the advent of the LS-Series. Many were produced with both "negative deck-height" and "negative piston-to-bore" clearances. While the book touches lightly on deck height, there's nothing about the piston clearance issue. Both are dramatic departures from the engine technology some LS-Series newbies might expect and, thus, deserved more in-depth coverage. In spite of those problems, overall, Werner's book is just about a "must" for budding LS-Series aficionados. Its methods of instructions and the wide range of material makes the book valuable for both beginners as well as intermediates with previous experience with engine work but whom are taking their first steps into the Gen 3/4 arena. That said, I differ philosophically

with the Author on a couple of issues. First, How to Rebuild GM LS-Series Engines advocates Sealed Power "Plastigage" when setting bearing clearances. Werner's feels Plastigage is a better choice than "cheap" measuring equipment. In my mind, that implies a bit of arrogance on the Author's part in assuming that DIYs will universally gravitate towards inaccurate tools. I disagree with that and feel that measuring with measuring tools of the same quality used in general machine shops--which can be purchased at reasonable prices--is a better choice than Plastigage. I polled a couple of engine builders and neither disagreed. Secondly was Warner's belief that impact tools should not be used during disassembly because they cause bolts to strip threads. Again, I polled a couple of engine builders I respect and both felt that was inaccurate. This reviewer (an "advanced DIY" with 25+ years of experience) has never had a bolt hole thread failure solely due to use of an impact wrench during disassembly. While use of power tools during assembly should be left for production lines at GM Powertrain, if threads are going to strip on disassembly; it won't matter whether you are turning the bolt with a combination wrench, a 1/2-drive socket or an impact gun. When queried about this issue, the Author, also, cites "work-hardening" of the bolt due to removal with impact tools as a threat. I say to that (as do engine builders and an spokesperson at Automotive Racing Products, the premier fastener manufacturer in the aftermarket)...bunk. But, again, those last two points are philosophical differences between the Author, engine builders, fastener engineers and an engine-building book reviewer, not issues which will prevent a good overhaul. You can rebuild an engine in an acceptable manner using Plastigage and restricting your self to hand tools during disassembly. You just might not be able to do it as accurately or as easily. Chris Werner's How to Rebuild GM LS-Series Engines is a great read for anyone interested in the deep-gearhead side of the Gen III/IV engines and pretty much a requirement is you're going to pull an LS motor for heavy maintenance. The only things keeping this book from being "excellent" rather than just very good, are teeny-tiny photos.

At this time I'm still going thru this book. I'm a big fan of the LS Series engine so of course I bought into this one. If your already an engine builder theres alot of knowledge brought out in this book that will be pretty standard, but if your new to the LS engines then this is really a decent book. It contains part#'s and various tricks of the trade to make your rebuild more streamlined. I can say that I recommend this book based on the fact that any increase in knowledge is a positive thing.

The book is extremely thorough, and filled with good color photographs of nearly every step. This book should (in my opinion) allow anyone with basic mechanical skills to tear down and rebuild any

LS-series engine. I've rebuilt engines before, but never an LS one, so I'm using this book for my 402cui LQ9 build, and I have yet to encounter a step which isn't covered in the book.

This detailed overview of GM LS series motors is quite thorough and easy to read and follow. Whether you're a gearhead or just looking to get a historical overview of the inner workings of your LS series motor, this book is a must have. Even if you never intend to pull apart and rebuild a motor, this book is great to have simply to know more about how an engine works, and is built in general. The step by step instructions are good. It goes into detail with not only what needs to be done at each step, but also why, and what tools you need, and it even goes into the different development of parts over the history of the LS series of motors. One day I plan on building a larger motor from the ground up with my son (he's only 2 right now, so he's got a few years), and this book is and has been a great how-to guide. Even if you don't want to do the work yourself, it's a good read to understand what you're paying someone else to do. So when they start throwing out measurements for your motor build, you'll know exactly what they are talking about. The only downside to this book, is with the rate that GM keeps updating these motors, you're going to need a new revision every 18 months. If you're the kind of person who isn't satisfied with stock, then this is the book for you. Like I said, even if you don't plan on doing the work yourself, at least you'll have a better understanding of what's being done. Knowledge is power, how much power do you want???

I believe this book to be a first step introduction on "what to look for" when working on LS1 and LS6 engines from 1997- 2008. There are a lot of other background information on topics like history, inspections, disassembly and selecting aftermarket upgrades. There are plenty of photos and illustrations to help visualize the parts. Also, the technical information is easy explained. I think this would be a good starting point for anyone who is preparing to build their next LS-series engine.

This book is an excellent book for the serious hobbyist that wants to get into LS engines. If you are rebuilding an LS I highly recommend it. Remember the name of the book emphasizes "How to Rebuild." The title is not how to build a high performance LS. I bought two copies of the book; one for the shop and one for home as a reference. As there are some differences between the various LS engines I suggest you carefully document your engine as you tear it down. If you are working on an LSA, LS9, or LS7 you will need to supplement the information in this book from other sources.

This is the best step by step how to book with clear easy to understand and plenty of pics.. I don't

think there is a need for any other book.. This is the only book u need to do a full engine rebuild.. I have many books and DVDs but this is the best and I found out I didn't need the other book.. Get this before you build.

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