

**THE NEW ZEALAND
CAR CONSTRUCTION MANUAL
ACKNOWLEDGEMENTS**

**1st Amendment
NOVEMBER
2010**

Tony Johnson
Low Volume Vehicle Technical Association (Inc.)

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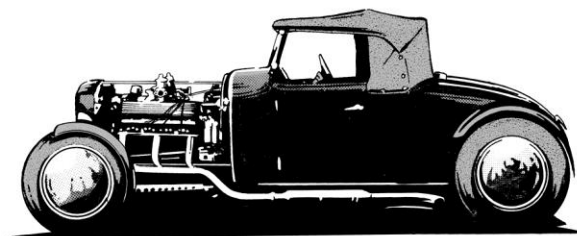
THE NEW ZEALAND CAR CONSTRUCTION MANUAL

Author: Tony Johnson

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AUTHOR

The New Zealand Car Construction Manual was written by Tony Johnson of Auckland New Zealand, for the NZHRA, who originally commissioned the development of the Manual in 2002. Tony has continued to take responsibility for the on-going amendments to the Manual for NZHRA, and for LVVTA since LVVTA took ownership of the Manual in October 2010.

Tony is a self-employed illustrator, journalist, technical writer, and automotive consultant, and is a member of various car clubs and associations.

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NZHRA, and its key personnel, have, and continue to since the inception of LVV certification, form the back-bone of the LVV certification system in New Zealand. LVVTA is very appreciative of NZHRA's on-going commitment and integrity.



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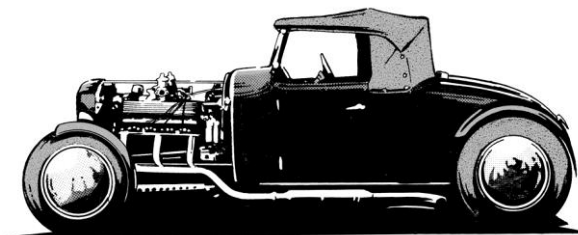
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Acknowledgements

The development of this NZ Car Construction Manual has been a huge team effort over a six-year period, and there are many people who deserve recognition for their part in it.

The Technical Advisory Committee

The heart and soul of this manual has come from the NZHRA members who sit on the Technical Advisory Committee (TAC), and who have given untold evenings over the six-year period, all on a voluntary basis, in order to achieve the countless technical decisions upon which this manual is based.

Getting the technical content worked out and agreed has been a much more time-consuming and difficult process than any of us might have imagined it would be, when we started down this track in 2000. But, we've got there, and that's primarily thanks to the experience, expertise, and dedication of the TAC members. Here's a very brief introduction of the team that provided all of the engineering and mechanical knowledge that makes up the manual:

- Alan Smail; fitter/turner by trade with 40 years in the engineering industry, been in hot rodding since 1963 (in North Shore R&CC for most of that time), crew-chief for 'Hombre' and 'Baloo' hemi alteredes in the '60s and '70s, and has raced cars of some sort since 16 years of age. Currently owns a self-built Model-A roadster hot rod, and races a Gurney Ford-powered speedway midget.
- Chris Litherland; senior aircraft engineer for Air New Zealand, hot rod club member (Southside Streeters, Papakura HRC) since 1973, has built top-level '23 T-bucket and '32 Tudor hot rods, past LVV certifier, been on the TAC since 1993, designer and builder of the test-rig used to prove or disprove some of our hot rod engineering theories, and is in recent years involved in general product inventing.
- Geoff Cottle; automotive engineer (heavy equipment) by trade, has owned and operated mechanical and auto electrical company for 20 years (Cottle Motors and Electrics in Kumeu), hot rod club member (Harbour City and Midwest) for 16 years. Has raced speedway midgets, and currently owns blown '23 T-bucket (built while still at school) '37 Ford sedan hot rod, and '34 Chev sedan hot rod.
- Graham Walls; mechanical draughtsman by trade, been in hot rodding for 30 years (Harbour City Rod Club), Life Member of NZHRA, CAD-illustrator extraordinaire (responsible for the CAD diagrams in this manual), TAC member since its inception in 1990, and currently in the final stages of his own fenderless '34 Ford coupe hot rod.
- John Reid; auto electrician by trade, also worked in heavy transport engineering and hydraulics, hot rod club member since 1966, founder and Life Member of Riverside Rodders, has built top-level hot rods since 1968 ('Vandal'/'Black Sabbath' Dodge bucket, 40 Ford pick-up, 'Elderberry Wine' Model-A sedan-delivery, 'Billet' Model-A coupe), professional hot rod builder (Rods by Reid in Tauranga) for over 20 years. Currently owns self-built '33 Ford coupe hot rod, and is building a '32 Ford pick-up hot rod.

- Mark Stokes; motor mechanic, mechanical workshop owner for 20 years, raced go karts, crewed on midgets, production saloons, Bonneville land speed record car, and crew-chief on Targa car (NZ and Australia) and Wild Bunch drag car. Hot rod club member (Auckland, Franklin, Southside) since 1972, currently involved in racing vintage speedway midgets, and owns restored and custom motorcycles, self-built blown Model-A roadster pick-up hot rod, '60 Ford Starliner, and building blown Porsche-engined '32 Ford. Has been an LVV certifier since 1995.
- Paul Sattler; qualified auto electrician and qualified motor mechanic, has also worked in light engineering and engine building, 35 years in hot rodding and drag racing, as well as a stint in off-shore power boat racing, hot rod club member (Yankee Haulers and Whakatane) since 1972. Owns self-built street & strip Model-A Ford coupe hot rod, '42 Ford sedan hot rod, races a blown and injected Chev-powered front-engined dragster, and holds a world land speed record. LVV Certifier since system began in 1992.
- Terry Bowden; fitter/turner by trade, professional hot rod and drag race car builder for 15 years (Terry's Chassis Shop in Auckland), and widely considered to be NZ's leading drag race car builder. Long-time hot rod club member (North Shore R&CC, Pukekohe HRC), previously raced his own 10-second 'Insane' T-bucket, involved in several championship-winning Super Stock drag cars, builder/owner/crew-chief of Australasia's quickest 4-cylinder drag car, now crew-chief of the quickest and fastest Pro-import drag car on planet earth.

The input of these guys into the development of the new Car Construction Manual has been enormous – a fantastic effort chaps - a huge thanks to all of you. Future generations of hot rodders and other hobby car builders to come, will, I'm sure, be massively grateful and appreciative of what you have done for them.

And amongst this great team of experts, special appreciation must be extended to Tauranga's Paul Sattler and John Reid. Thank you guys, not just for your input at the TAC meetings, but for making the 6-hour round trip from Tauranga to attend the majority of the monthly TAC meetings held in Auckland over the last six years. An awesome effort Pins and JR; - your technical input has been immeasurable, your commitment staggering, and your sense of humour greatly appreciated!

Co-opted Technical Advisory Committee members

Others from outside the NZHRA membership have helped us to make this a true 'car' construction manual, rather than a document devoted to just hot rods, as was the original Code of Construction Manual. These people also, have contributed a great deal of voluntary time to attend TAC meetings, and have been a great help.

These helpers include Andrew Denton, Walter Wing, and John Ward from the Sports Car Club of New Zealand, who have made sure that the light-weight home-built sports car builder is well catered for within the new manual. Special thanks amongst those from the Sports Car Club of New Zealand must go to John Ward, who has contributed an absolute wealth of engineering and mechanical expertise in the area of lightweight specials over a long period of the manual's development time. Other co-opted helpers include Peter Vahry from the New Zealand Four Wheel Drive Association, and Kerry Buchanan from Kiwi Trikers Social Club.

From time to time, the TAC have sought additional support and advice from people who have special expertise in certain areas, including Dave McDougal (D&V Autos) of Kumeu who put in a big effort during the first couple of years of the manual's development, and has always been willing to provide great advice. Les Hunter of Christchurch (Les Hunter Automotive) was a huge help with the braking component information you'll see in Chapter 8, plus Geoff Dixon of BG Marketing and Paul Weir gave us input on wheels, and 'Mopar' Mike Walters advised on glazing.

Submitters and reviewers

Several people made excellent initial submissions when this project began; many thanks to hot rodders Rick Murray, Neal Miller, Redvers Charles, Stephen Monteperto, Steve Rhodes, Jeff Marshall, Brett Wells, Graeme Doree, and Leon Sutherland. Great input guys - nearly all of it was used.

Another group of hobby car experts from throughout the country reviewed the various chapters as the TAC finished their part, feeding back excellent comments and suggestions, and introducing many new ideas. Many thanks to hot rodders Jon Elley, Gary Martin, Neal Miller, Barry Pope, Redvers Charles, Peter Watson, Andrew Smith, Lloyd Wilson, and Les Dick, along with enthusiasts of other automotive denominations Dan Martin and Ewan Fisk. Group submissions came from the members of New Zealand Four Wheel Drive Association, Constructors Car Club, and the Wellington Regional Certifiers' Group, all of which was very useful and much appreciated.

NZHRA Certifiers

To all of the past and present LVV Certifiers from the NZHRA hot rodding community, I would like to thank you for playing a part in evolving the LVV system to where it is now – which has enabled this new Car Construction Manual to be developed - by being an LVV Certifier at some stage. Sadly, a few great guys, including Maurice Hipperson and Pete Dore, are no longer with us.

Extra special appreciation must go to some of the LVV Certifiers who come from the NZHRA hot rodding community, and who have been scratch-built-authorised LVV Certifiers since the system's inception in March 1992, and still remain so now 18 years later. You blokes have provided, and continue to provide, the strong and stable backbone of the LVV certification system. The expertise, experience, and integrity of you guys forms a major part of the reason for the low volume vehicle system's success to date.

They are: Noel McMillin (Hamilton), Neal Miller (Hamilton), Paul Sattler (Tauranga), Steve Hildred (New Plymouth), Grant Rivers (Wanganui), Andrew Smith (Levin), Don Hoff (Christchurch), Jon Palmer (Timaru), Roy McDonald (Dunedin), Graham Fitzpatrick (Dunedin), and Barry Pope (Invercargill).

There are other people from the NZHRA hot rodding community that dived in soon after the system started and have stuck with it, applying the same level of diligence and skill as those listed above. They are: Mark Stokes (Auckland), Dean Longhurst (Rotorua), Marty Jones (Palmerston North), Danny McKenna (Palmerston North), Julian Cheer (Wairarapa), Brent Pahl (Nelson), Steve Rhodes (Timaru), and Peter Watson (Gore).

To all of you guys, we're all hugely grateful to you for being there, and enabling the LVV system to continue and to improve, so that we can all still build the cars that are so near and dear to our hearts.

The knowledge that these LVV Certifiers have accumulated over the past 18 years, on top of what they already knew at the start, would make your head spin. They've seen it all, both good and bad, and the help and advice that they can provide you during the LVV certification process as your project progresses, is truly priceless. Auckland's Mark Stokes, for example, has LVV certified over 7000 modified and scratch-built cars – the resultant knowledge and expertise on those shoulders is beyond imagination. Much of the content of this manual has come from what these experienced LVV Certifiers have seen and learnt, and passed on to us over their years of involvement.

NZHRA has a list of NZHRA-endorsed LVV certifiers listed on their website (www.hotrod.org.nz), and they encourage you to use these LVV Certifiers for your next project.

Others

I'd like to express my appreciation to the members of the Executive Committee of NZHRA (some of whom have been and gone during the development of this manual) for having the foresight and the patience to maintain priority on getting the job done right, even though it's taken a lot longer than we'd all initially planned. Amongst them, I'd like to say a special thanks to 'Bonneville Chris' Harris and Errol Uttinger for staying so positive throughout the job, and giving me the necessary encouragement to stick with it, despite the hurdles and the enormity of the job.

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TAC member Graham Walls of Harbour City Rod Club is an absolute legend – he's the sole remaining member of the original TAC group that helped me to write the original Code of Construction Manual from 1990 to 1992, and again, as well as providing valuable technical input and being the most solid and reliable guy on the planet, he's been the provider of the brilliant technical CAD-diagrams throughout the manual.

Many thanks to the proof-reading team, a job that on its own consumed well over 200 hours, and like everyone else mentioned here, all done on a voluntary basis; Linda Washington, Linda's mum Gwen Washington, and my scholarly sisters Rachael Haverkamp and Raewyne Johnson ('Speedy & Fussy').

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Lastly, many thanks to all the NZHRA members who have patiently waited (for far too long) for this NZ Car Construction Manual to be completed. Hopefully, the technical expertise that the TAC guys and all the helpers have put into this manual will help you with the next car you build or modify in some way. I wish you all the very best of luck with your current and future hobby car projects, and lets all recognise that, thanks in no small part to the help of everyone acknowledged in these pages, our kids and grand-kids will all be able to continue building and driving hot rods, sports cars, or whatever it is that gives them their buzz, for many decades to come.

TJ.