V10 Formula 1 Engine Technology, Ian Bamsey, RaceCar Graphic Limited, 2005, 0953352404, 9780953352401, . .

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Racing Cars , Frances Ridley, Cliff Moon, Aug 1, 2006, , 48 pages. .

Formula One The British Influence in F1, Clive Couldwell, Sep 1, 2003, , 246 pages. 75 percent of the world's single-seater racing cars are designed and built in Britain. Thanks to this technical know-how, most Grand Prix teams are based in the UK, and many of ....

Formula One Racing , Tom Greve, Aug 1, 2008, , 24 pages. Presents information about Formula One racing, including equipment specifications, rules and regulations, safety requirements, and the history of the sport..

High-Tech Engines Your Complete Guide to High-Tech Engines, Julian Edgar, Jan 1, 2000, , 160 pages. This highly illustrated reference guides readers through the many options available for car rebuilders using today's high-tech aftermarket equipment. Content includes topics ....

Racing Cars , Jeff Savage, Jan 1, 1996, Sports & Recreation, 48 pages. Describes some popular race cars and discusses some of the races in which they compete..

Formula 1 Racing , A. T. McKenna, Sep 1, 1998, Sports & Recreation, 32 pages. Describes the design and construction of Formula 1 race cars and the action during the international Grand Prix races..

Great racing cars , George Sullivan, 1987, Sports & Recreation, 64 pages. Describes a wide variety of racing cars and the races in which they are used..

Fast Cars , Frances Ridley, Jul 1, 2006, , 48 pages. .

Formula one , Bob Judd, 1989, , 330 pages. Forrest Evers, a retired race driver vows to uncover those who are sabotaging his team's cars, in a thriller that conveys the excitement and politics of Formula One car racing.

Formula 1 2002/2003. Tecnical analysis , Giorgio Piola, Dec 1, 2003, , 116 pages. This is, by now, a traditional technical analysis of the previous season, which saw Ferrari and Michael Schumacher win again the World Drivers' and Constructors' championships ....

Drag Racer , Matthew Pitt, Mar 1, 2001, Sports & Recreation, 48 pages. Describes how drag racing started in 1930s California and evolved during the 1950s, and describes the rules and driving strategies of drag racers in the National Hot Rod ....

Hottest Race Cars , Erin Egan, Mar 1, 2009, Juvenile Nonfiction, 48 pages. "Read about open-wheel race cars, the drivers, and the races they compete in, such as Formula One, the Indy Racing League, and the Champ series"--Provided by publisher..

A Ribbon of Road in the Moonlight , Michael Pearson, 2009, , 250 pages. The story concerns Mike Brookes and his Pegasus Car Company as they attempt to build and enter a two car team for the 1957 Targa Florio road race in Sicily. Pegasus build road ....

Racing cars , Robert Blake Jackson, 1970, Sports & Recreation, 63 pages. A guide to all types of racing cars, United States racing organizations, American racing circuits, and the most important annual races..

This is an in depth look at the empirical modeling of an engine.Â If you are not interested in modeling it is still great as it will help you understand the workings of air, heat, sound, and combustion inside the engine.Â Though overwhelming at times, there are many great equations, and I am sure many of us will find some of them helpful.Â Available through SAE.Â

This is an interesting look inside of the V10 F1 engiBamseyIt is very detailed and though it is almost made in a coffee table book style it contains a lot of information about these engines.Â Those that are concerned about the information in this book being superficial need not worry, the concepts are explained in detail, yet in simple terms.

This is almost a novel, about materials science by aEberhartical quantum materials physicist.Â It begins with the author wondering how to make his childhood marbles stronger and ends with the reader wanting to learn much more about materials.Â Since this such an important subject within engine design and this book is an extremelyPlease publish or preview this page to view this custom HTML. easy introduction to the subject it ranks high on mextremelyPleasereads for someone beginning to learn about engine design.Â It is a good easy read and break from typical technical books as it covers theory and not numbers.

Â Both of these books hold a large amount of useful engineering information applied to race cars in a practical way.Â If nothing else, his way of thinking about theory and practice simultaneously is extremely useful.Â After reading the Nuts, Bolts, Fasteners and Plumbing Handbook you will most likely look at a common bolt completely different, and will be abhorred by the typical design and implementation.Â Â

I believe in freedom of information but still wish that inventors and designers can be compensated for their contributions. Â Any part of this web page can be distributed under 3 conditions, distribution is not for profit, credit must be given to the author, and inform the website owner of your use of the material by writing to mattsengines@gmail.com .

Why the move away from the V-10? The V-10 is considered too powerful so the new F-1 rules mandate a 2.4 litre V-8 with a compulsory 90 degree bank angle whose major dimensions are set and with restrictions on what materials may be utilised within the engine (not allowed to use beryllium for instance). Will this get the "closer racing" the organisers lust after? Who knows? Who cares? Probably won't.

The cost of F-1 racing has become super expensive. While it would be safe to say that a large proportion of the money is wasted on gush ("star" drivers, silly promotions, gossip manufacturing, stunts and other banality etc) the ever more restrictive rules require larger and larger investments to hone small improvements out of the cars just to stay in the racing game. In the end it is the rules themselves that restrict innovation and banish good engineering practice to the point where increasing expense is the only result.

As for watching exciting close racing; if its racing action that is required there are far better formulae to watch (circle track, rallies, motorcycles, NASCAR and so on). F-1 has degenerated into a single file of cars parading around a course. They can't easily overtake for aerodynamic reasons (oops-rules again). The courses are so artificial that the largest bumps are only allowed to be millimetres high. This is the formula for boring to watch and boring to follow.

As far as race car design is concerned, F1 should be related to reality. That means bumps, pot-holes, repairs and patches on the track (like real roads). That means we get to see some real working, moving suspension again. It means very few restrictions on designers looking for innovative solutions to problems.

You are right about the rules pertaining to safety. There is a need to provide some reasonable safety for the driver (IF there is a driver- colleagues of mine prefer to make F1 a completely open technology formula which means the driver is optional, an artificially intelligent car would be legal in his scheme!).

Returning to engines; I'd enjoy seeing the use of unusal designs. Remember the Can Am? Porsche had a turbo flat 12 and were working on a 16 cylinder engine! One Can Am team had a car powered by several two-stroke engines. Even F-1 used to show some interesting design in engines. BRM ran a Tony Rudd designed H-16. Honda were said to be considering a W-24 when the rules were altered to specify a maximum number of cylinders (12 at that time). Fascinating stuff.

I read a paper by Sir Roy Feddon (issued at the end of WW2 where the design philosophies of British and German engines are contrasted). That was most interesting and whet my appetite to know more about the German designs. I have not worked on any German aircraft piston engines and I'd like to know more about them.

The reason beryillium was banned is supposed to be due to the health risks to the public. Pure beryllium dust is really toxic. People who work with compounds of it often get symptoms of hay fever and other respiratory ailments, (it scars the lungs) from minute amounts, so any crashes or bumps in a F1 car could release contaminants into the air, causing real problems to spectators, at the race track. (although, I think that is an excuse from teams that can't afford to use these expensive alloys: shades of 'our tyres might be dangerous, so why don't we slow all the cars down?')

One I do have is 'Major Piston Aero Engines of World War II' by Victor Bingham, published by Airlife. ISBN 1 84037 012 2. About 190 pages, large format. It covers the usual allied engines but has short chapters on BMW 801, Jumo 211, DB 601 and developments plus Gnome 14, Hisso 12 and one on USSR State Factory engines. Packed with detailed technical information. I'm no expert but would definitely recommend it.

In true British fashion, this book was published during WW2 to raise funds for the war effort. The fact that it is based upon official reports of the engines of the enemy we were fighting at the time shows real confidence in producing a best-seller. It's also a surprisingly unbiased view, considering the era with C. G. Grey running The Aeroplane magazine.

Re the use of beryllium in race cars - In the 60's Porsche used beryllium brake rotors (in the 906, I think). The engineers thought it would make a great rotor material. When the drivers started reporting that the fumes were making them violently ill, the team manager made aspersions about their "manliness", until the lead development driver (a German) refused to drive the car so equiped - so much for industrial hygiene!

Speaking of the Junkers book, I have heard very stern criticism aired at it. From the reviews I have formed the opinion that the book does not represent latest research. Rather it represents 1960-70s state of knowledge. Very sad indeed as the book on German gas turbines from the same fellow is excellent. But this should be no surprise as usually jets and jet aiorcraft get excellent coverage in books while real things are haphazardly covered. E.g. Bill Gunston, the editor of Jane´s Aero Engines, seems to lack deeper knowledge about the DB hydraulic coupling as he claims that the blower may be entirely disconnected at low altitude which claim is utter BS.

BTW, any update on the status of the Russian Piston Engine book? I hope it has ample coverage of Mikulin´s AM series. Not only it is the only series produced aero engine of the time with variable geometry blower inlet with the Jumo 213 (the latter copied the former), it seems also to be the only series produced DOHC aero engine of the war. BTW, I wonder why other makers of 4-valve V-engines did not adopt double camshafts?

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Up for sale here is a used copy of "V10: Formula 1 Engine Technology" hardcover book, signed by the author Ian Bamsey. This was a limited edition run that I got when it was new shipped from England. The dust jacket has minor wear and one page is lightly damaged (as shown in the pic). These are out of print, and would make a great addition to any Formula 1 Fans library!

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Formula One currently uses 2.4 litre four-stroke naturally aspirated V8 reciprocating engines. They typically produce 224 kilowatts (300 bhp, 304 PS) per litre of displacement, far higher than most naturally aspirated internal combustion engines. This will change to smaller-displacement turbocharged V6 for the 2014 season.[1]

The power a Formula One engine produces is generated by operating at a very high rotational speed, up to 18,000 revolutions per minute (RPM).[2] This contrasts with road car engines of a similar size which typically operate at less than 6,000 rpm. The basic configuration of a naturally aspirated Formula One engine has not been greatly modified since the 1967 Cosworth DFV and the mean effective pressure has stayed at around 14 bar MEP.[3] Until the mid-1980s Formula One engines were limited to around 12,000 rpm due to the traditional metal valve springs used inside the engine to close the valves. The speed required to operate the engine valves at a higher RPM is much greater than the metal valve springs can achieve and they were replaced by pneumatic valve springs introduced by Renault.[citation needed] Since the 1990s, all[citation needed] Formula One engine manufacturers now use pneumatic valve springs with the pressurised air allowing engines to reach speeds of nearly 20,000 rpm.

The bore is the diameter of the cylinder in the engine block, and the stroke is the distance the piston travels from top dead-centre (TDC) to bottom dead-centre (BDC) inside the cylinder. To operate at high engine speeds the stroke must be relatively short to prevent catastrophic failure; this is usually connecting rod failure as the rod is under very large stresses at these speeds. Having a short stroke means that a relatively large bore is required to make the 2.4 litre displacement. This results in a less efficient combustion stroke, especially at lower RPM.[citation needed] The stroke of a Formula One engine is approximately 39.7 mm (1.56 in), less than half the bore diameter (98.0 mm), what is known as an over-square configuration.

In addition to the use of pneumatic valve springs a Formula One engine's high RPM output has been made possible due to advances in metallurgy and design allowing lighter pistons and connecting rods to withstand the accelerations necessary to attain such high speeds, also by narrowing the connecting rod ends allowing for narrower main bearings. This allows for higher RPM with less bearing-damaging heat build-up. For each stroke, the piston goes from a null speed, to almost two times the mean speed, (approximately 40 m/s) then back to zero. This will occur 4 times for each of the 4 strokes in the cycle. Maximum piston acceleration occurs at top dead center and is in the region of 95,000 m/s2, about 10,000 times standard gravity or 10,000 g.

This era used pre-war voiturette engine regulations, with 4.5 L atmospheric and 1.5 L supercharged engines. Formula 2 cars were allowed, and the World Championship was run under F2 rules in 1952 and 1953, but F1 races were still held in those years. The Indianapolis 500 used pre-war Grand Prix regulations, with 4.5 L atmospheric and 3.0 L supercharged engines. The power range was up to 425 hp (317 kW).

Introduced in 1961 amidst some criticism, the new reduced engine 1.5 L formula took control of F1 just as every team and manufacturer switched from front to mid-engined cars. Although these were initially underpowered, five years later average power had increased by nearly 50% and lap times were better than in 1960. The old 2.5 L formula had been retained for International Formula racing, but this didn't achieve much success until the introduction of the Tasman Series in Australia and New Zealand during the winter season, leaving the 1.5 L cars as the fastest single seaters in Europe during this time. The power range was between 150 hp (112 kW) and 225 hp (168 kW).

Following the turbo domination, forced induction was allowed for two seasons before its eventual ban. The FIA regulations limited boost pressure, to 4 bar in qualifying in 1987 for 1.5 L turbo; and allowed a bigger 3.5 L formula. These seasons were still dominated by turbocharged engines, the Honda RA167E V6 supplying Nelson Piquet winning the 1987 Formula One season on a Williams also winning the constructors championship, followed by TAG-Porsche P01 V6 in McLaren then Honda again with the previous RA166E for Lotus then Ferrari's own 033D V6.

The rest of the grid was powered by the Ford GBA V6 turbo with Benetton, then the only naturally aspirated engine, the DFV-derived Ford Cosworth DFZ 3.5 L V8 outputting 575 hp (429 kW) in Tyrrell, Lola, AGS, March and Coloni.[5] The BMW M12/13 inline four was found in Brabhams BT55 tilted almost horizontally, and in upright position under the Megatron brand in Arrows and one Ligier, producing 900 bhp (670 kW) at 3.8 bars in race.[6] Zakspeed was building its own turbo inline four, Alfa Romeo was powering the other Ligier with the 415T inline four and the 890T V8 in Osella, and Minardi was powered by a Motori Moderni V6.