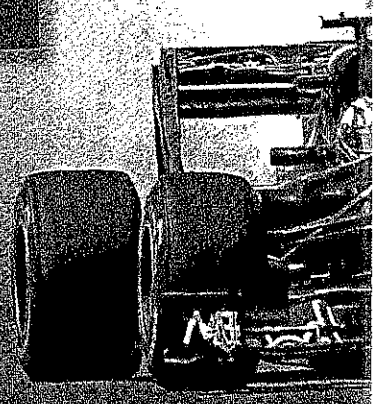


THE LAST V8?



ABOVE It's the end of the road for Jaime Alguersuari's Ferrari engine, but is it the end for V8s altogether? (Photo: Andrew Ferraro/LAT Photographic)

A last-gasp attempt to derail the 2013 powertrain regulations has prompted controversy. But when the smoke settles, will Formula One have the environmentally-friendly powertrain it dreamed of? By **Matt Youson**

CHANGE is the only reliable constant in F1 at the moment. After a decade of glacial development, the last few years have witnessed upheaval: new aerodynamic rules and KERS for 2009; whole race fuel tanks and no KERS for 2010; a new tyre supplier, fixed weight distribution and KERS again for 2011. No one knows what'll happen for 2012, but you wouldn't bet against jet packs, though in comparison to what's coming for 2013, even that might seem unambitious. 2013 will see the biggest change of them all, because F1 gets a new engine – probably.

But not an engine in isolation. In keeping with the direction encouraged – but not necessarily enforced – by the FIA over the last five years, the proposed unit will at least pay lip service to the idea of road-relevancy with a specification expected to involve a smaller displacement and fewer cylinders. KERS will be upgraded to store and release more power – probably 120 kW – and a maximum fuel flow is expected to be instigated, reducing race-distance consumption to a level considerably lower than that seen today. The high-revving powerplant will also

while simultaneously switching to a more economical powerplant is well worth the price. Others see only costs and not any tangible benefits.

Beyond the engine manufacturers, in the paddock at large, the sense is that F1 needs to do something, and needs to be seen to be doing something. Jonathan Neale, McLaren Racing's managing director, sums it up thus: "I think that the FIA are right to recognise that Formula One needs a new engine that is high performance and contemporary in terms of where the sport is going, and I think the move of the sport towards a more energy efficient operation will be sensible. Inevitably that means a better integration of hybrid technology, but things like turbocharging have a place too. Making the engine relevant to the consumers of automotive products makes it relevant to us."

MANUFACTURER BAIT

That view is broadly shared around the paddock by the independents, even though they nominally have the least amount of vested interest in a discussion

“Rules with enough room for relevant power units but not for spending €50 million to create an extra 20 horsepower”

become a thing of the past, as the engine is sure to also be turbocharged. With a knock-on effect to chassis design, F1 as we know it is being turned on its head. Again.

At least that's the popular thinking. There is still dissent in the ranks; the new engine is likely to add cost and complexity to the engineering challenge at a time of reduced resources and supposedly downsizing teams. Some of the engine manufacturers think bringing F1 in line with the automotive industry

that is essentially a matter between the engine manufacturers and the FIA. "We're actually very interested in the final specification," admits Williams engineering director Patrick Head. "If it's something relevant in a way that causes other engine manufacturers to consider coming into F1, then that directly affects us. We're happily allied with Cosworth but a major manufacturer might be able to spend €50 million on developing a powertrain and carry the overhead of that ▶

R&D as an advertising cost, only charging customers the cost of manufacture. Cosworth on the other hand, might be able to do the same job for €20 million – but they still have to get that back from their customers. So our interest is in having an engine specification that isn't so open it encourages manufacturers to continually spend lots of money. That would probably be a deterrent."

TURBOS ARE BACK!

While cost and green credentials will undoubtedly frame the argument, the unwritten rule that an F1 engine also needs to be high-tech will probably come into play also. Aside from the KERS and all that entails, attention is being paid to the potential of a turbocharger. "That's certainly what's being discussed," says Head. "The engine will be less complicated but the turbocharger will most likely be used to take more energy from that exhaust than is required to power a compressor. It might do that electrically, charging the battery or flywheel, or mechanically feed the power

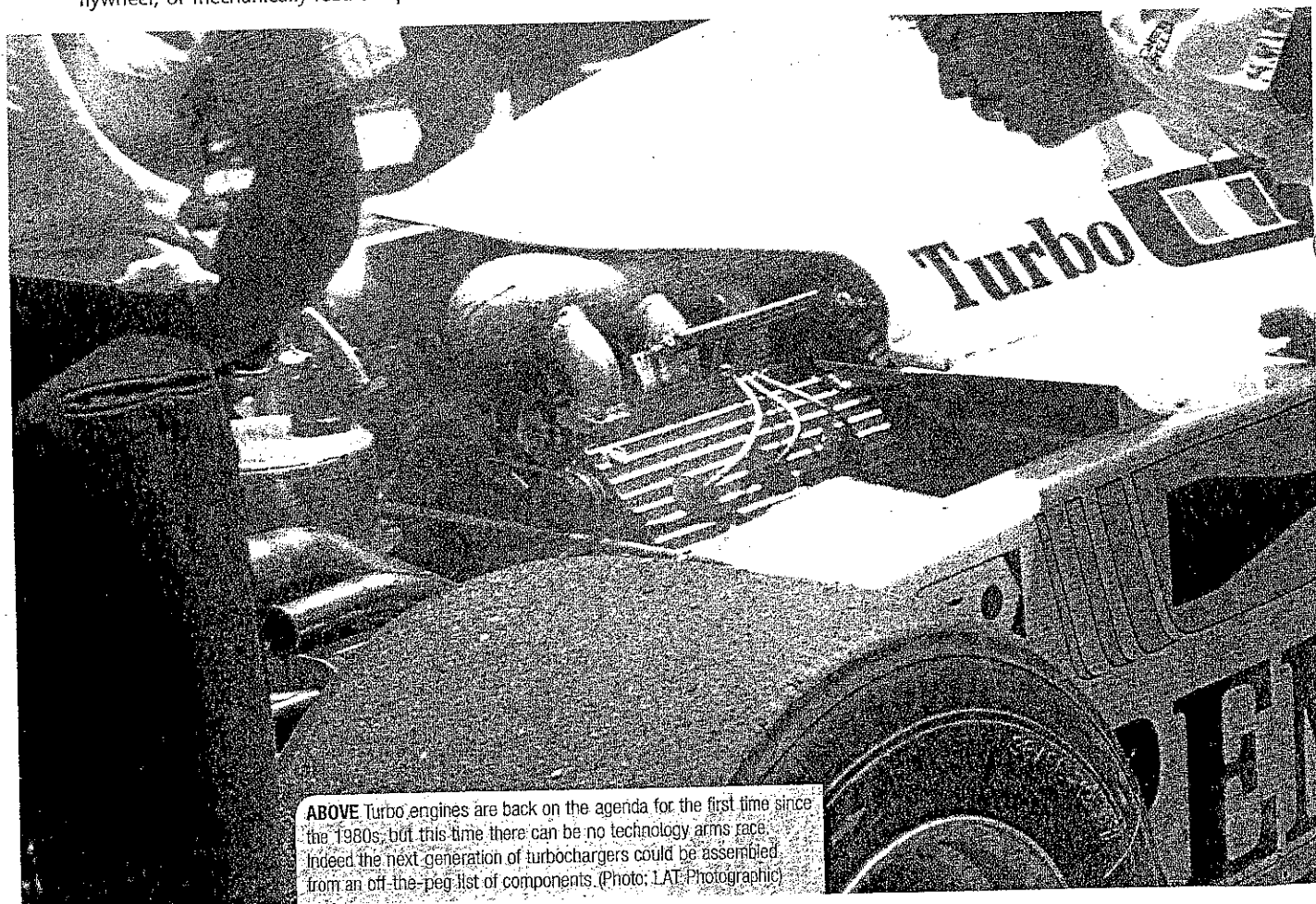
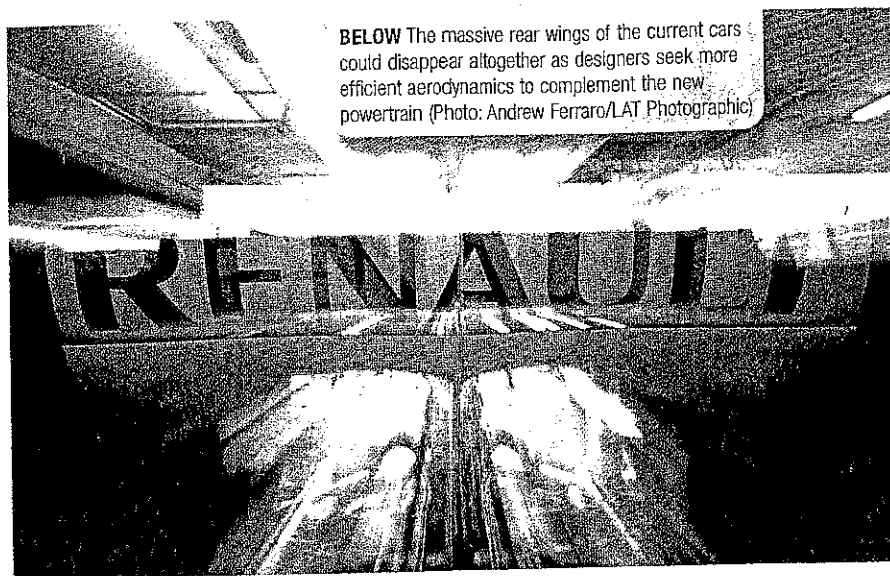
back to the engine."

While either system ticks the green box, it's unlikely to score in the low-cost column. "It's something to consider," says Neale, "we have to be cognizant of the fact the automotive industry has had a very difficult time, and a new engine this ambitious – and I think it is very ambitious – is an expensive undertaking: it has to be measured against what is

realistically affordable."

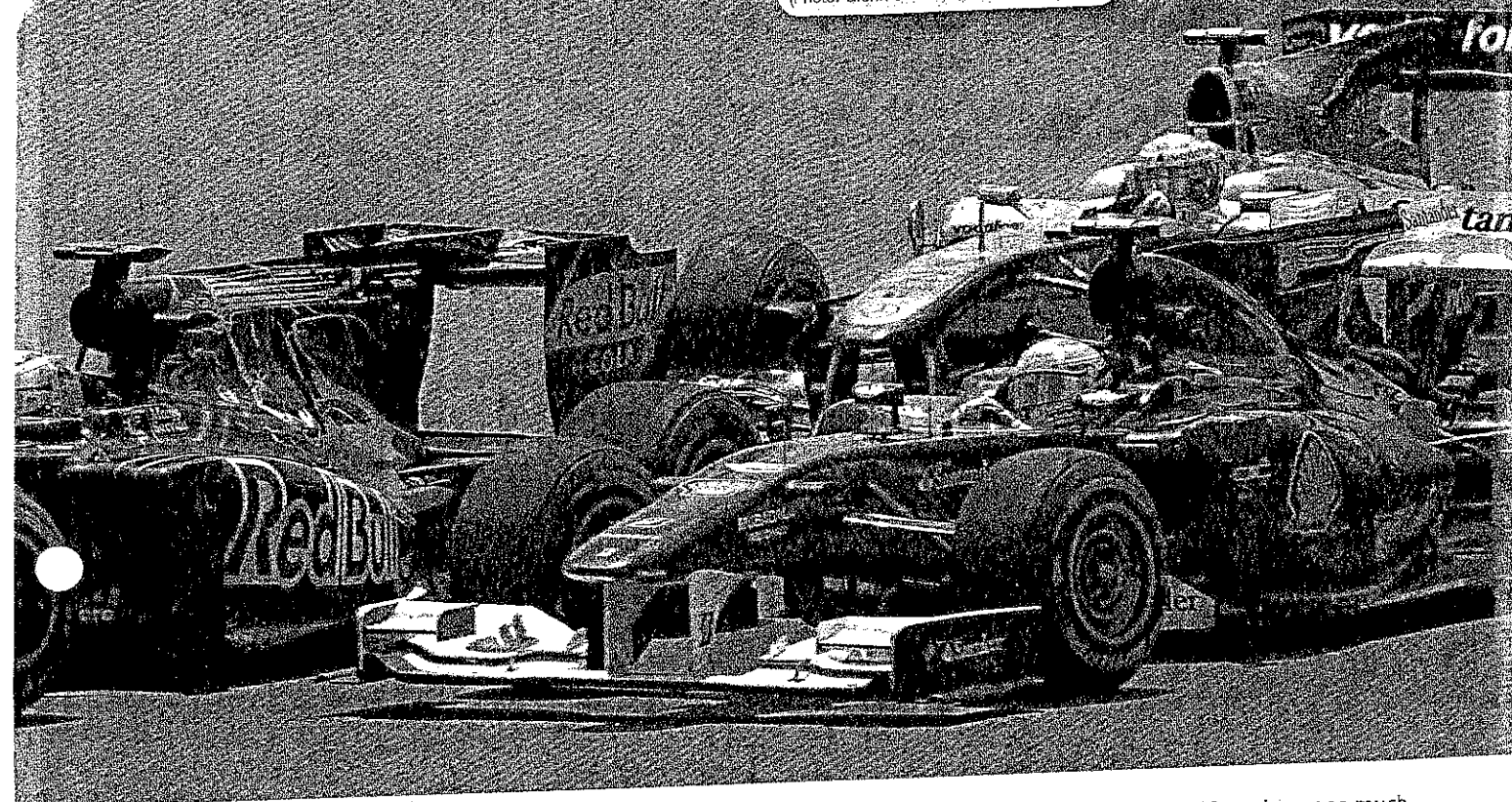
That particular point of view becomes more strident as one moves down the pitlane to the smaller teams. James Key, Sauber's technical director, puts it rather succinctly: "I think for us an independent team, the cost is very important. We're open to new technology and we understand the importance of it, but not being a manufacturer [with an automotive

BELOW The massive rear wings of the current cars could disappear altogether as designers seek more efficient aerodynamics to complement the new powertrain (Photo: Andrew Ferraro/LAT Photographic)



ABOVE Turbo engines are back on the agenda for the first time since the 1980s, but this time there can be no technology arms race. Indeed the next generation of turbochargers could be assembled from an off-the-peg list of components. (Photo: LAT Photographic)

BELOW The F1 paddock's ultimate nightmare is spoiling the show amidst the upheaval of the regulation changes (Photo: Glenn Dunbar/LAT Photographic)



advertising agenda] we have to see that the cost is under control and it suits the budget of an independent team. We're absolutely ready to support all the stuff people would like to do, but when it comes to actually putting it in place we have to be mindful of the realities: if it's going to be expensive and time-consuming to make it work – a little bit like KERS was in the first year – is it really to push everything through in one go?"

It's interesting to note how the landscape of F1 has changed since the year 2013 was first nailed down as the date for a new F1 engine specification. Back in 2007, the season before the engine freeze began, the world economy was buoyant; car sales were healthy if unspectacular and manufacturer teams still held sway. The 11 teams competing in F1 shared six works engines while the homologated Cosworth V8 was surplus to requirements. Fast forward to 2010 and three of the six engine manufacturers have left the sport, Cosworth is suddenly supplying a quarter of the grid and – crucially – horsepower has stopped being a talking point.

UNTHINKABLE

It means concepts previously unthinkable are suddenly seen as highly realistic; one such being common parts or, as Head

suggests, the idea of building turbochargers from an off-the-peg approved list of components.

"It's one of the things being discussed because a lot of teams don't think they're in a position to fund a turbocharger design race. That might result in a standard turbo or the possibility of naming a number of standard parts, complete with their part numbers from Garrett, IHI etc. The engine builders would be able to mix-

design but the 2013 engine goes much further than the usual requirements. The crucial element is the intention to introduce a maximum fuel-flow rate.

At a time when the automotive industry was striving to make cars lighter and engines more efficient, the initial KERS application added weight and with the regulations making it best suited as a power-boosting rather than a fuel-reducing technology, actually encouraged

Introducing KERS without also capping fuel flow lumbered F1 with a white elephant"

and-match from the list, and potentially make modifications, but the basic parts – turbines, shafts, compressors etc. – would all start out as standard production components. It's a workable idea with a modular device like a turbocharger."

Head stresses he isn't intimately involved in the discussions currently in progress; however, as a member of the group currently deciding chassis regulations to come into force at the same time as the new engine, he has more than a passing interest. Obviously any new engine specification makes demands upon chassis

F1 cars to burn more, rather than fewer hydrocarbons. Introducing KERS without also capping fuel flow lumbered F1 with a white elephant, which won't be the case in the post-2013 environment. However, the combination of a smaller engine – albeit boosted – with a restricted fuel flow means a lower horsepower formula. Add in the desire to maintain something approximating the lap times of current F1 cars and it becomes clear that the chassis regulations are going to demand much greater efficiency from the cars.

"We are not," says Head, "going back to ►

ground effect. There won't be sliding skirts or anything like that, but probably we'll be chased back to cars with a more shaped underside.

"The maximum fuel flow coupled with engine efficiency will dictate the power we have available, and it's likely to be less than we have with the 2.4-litre naturally-aspirated engine. That in turn dictates a car needing to have much less drag than is currently the case, which suggests using a lot less rear wing. But as the tyres

pushed ajar. "As an engineering challenge, it's going to be great," says Key. "2009 was enjoyable because the new regulation for aero that came in then opened up a whole load of new possibilities. Perhaps surprisingly the grid came together rather than spreading apart, which was good to see – so providing the cost doesn't build into something difficult to handle, from an engineering perspective it's going to be enjoyable."

There are, of course, words of warning

Much more likely is the idea of a rulebook written to discourage high-expenditure but allowing enough wiggle-room to swiftly erode any advantages. The engine freeze wouldn't be repeated, but nor would the sport's return to the sort of spendthrift profligacy that held sway a few years ago.

Head draws a comparison with the 2009 aero regulations, where the intention of a 50 per cent reduction in downforce was negated by the introduction of the double-diffusers. "The end result was front-running teams having more downforce at the end of 2009 than they did at the end of 2008. I think everybody is aware of what happened there, and everybody is keen to stop the same thing happening in 2013. I think the intention is to avoid homologation but to write the regulations in such a way as to allow enough room for relevant and more efficient power units but without allowing room for somebody spending an extra €50 million in an effort to create an engine with an extra 20 horsepower. It's difficult to do and it's a challenge for people with the responsibility for drafting the regulations – but it is a job that we need to be done if we are to ensure the regulations are crafted in such a way that you can't drive a coach-and-horses through them."

GREENER ENGINE

While doubt and opposition still exists, most parties are talking about a downsized engine as a fait accompli. Ultimately the FIA will make the decision, and every indication from the governing body suggests it is firmly in favour of a greener, more economical engine with greater road relevancy. It would be helpful for it were the teams to collectively come to that conclusion also, but it isn't strictly essential. Basically, the odds are in favour of this engine becoming a reality.

And with no doubts over the ingenuity and application of the engineers and engine designers involved, the twin tasks of creating a greener engine and a more efficient car are unlikely to prove insurmountable; but the idea of drafting a set of regulations that compels F1 teams to act with environmental and financial restraint, that indeed is a challenge worthy of the best brains in motorsport. **BT**

ABOVE The experience of last year's double diffuser controversy will help frame the 2013 regulations (Photo: LAT Photographic)

we'll be using will be much the same as the ones we have now, the cars are still going to have to generate a similar amount of downforce.

"That's likely to be much more integrated with the car shape and less hung off the ends in a big, ugly wing at the front and a huge bucket at the back, which necessarily means we need a more efficient car. It suggests either no rear wing at all or at least a much smaller unit – we won't be back to the early '80s but the expectation is that there will be much more shape to the underside between the wheels."

ENGINEERING CHALLENGE

Predictably the aerodynamicists are not unhappy at the prospect of having a door that has been firmly nailed shut suddenly

that need to be heeded. The nightmare scenario for Formula One is an uncompetitive series. The last few years have produced good head-to-head battles, but everyone remembers 2004, when Ferrari showed up at the first race with a car three seconds quicker than its nearest rival. Or rather everyone working in motorsport remembers: the viewers at home simply switched off. F1 understandably is anxious to not see a repeat of that; it simply can't afford it. Thus the new rules are likely to be written to prevent it.

One idea is to have the 2013 season as an extended homologation period, with the new specification frozen from 2014 onwards, though the costs involved in allowing – indeed encouraging – engine makers to engage in an all-out horsepower war makes this a long shot.

