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*This engine, Patch, built to power a Cortina, may just be the greatest single racing four ever built/Chris Harvey*

ENGINES WHICH POWER racing cars are like butterflies. Moments after flying high in a blaze of glory they may be dead. It's hard to have an enduring relationship with something which could be on its last revolution, so in a world where everything has its own name – the driver, the sponsor, the team manager, the mechanic and the car – engines have only numbers. Except Patch.

There is a magic about Patch that has transcended

mechanical barriers. Patch has a human personality. In fact, Patch may be the greatest racing engine ever built – because he has shown himself to be peerless in the most extreme circumstances, the code they call Formula Ford.

The specification of the engines for the tiny, wasp-like cars which contest this, the world's most successful form of racing, are very strictly controlled, because the organisers' express intention is to ensure that none of the aspiring world champions who drive them has an unfair advantage. Rivalry is razor-edged and no matter how good a driver is, a slightly lesser one with another half horsepower may be able to beat him. As a result, building the best Formula Ford engines without infringing the regulations has become an art form. Nothing less than perfection is demanded by patrons who spend comparative fortunes to promote their racing prodigies. Nobody would want to know an old engine lying shattered, disembowelled by a driver whose shrinking budget made him use it once too often. Except David Minister, that is.

Minister is an engine wizard who won't answer the phone. He prefers to immerse himself in building great racing engines, especially for Formula Ford. His partner, Graham Fuller, does the dirty work of handling difficult customers, creating confidence in nervous young stars, cracking champagne for them when they win – and keeping the VAT man happy – as Minister works each Cortina block with the hands of a concert pianist. It's no longer the cylinder block you will find in a modern Cortina, but one of the old Kent castings that featured in 1600cc models until 1970 and is still used in industrial applications today. In the interest of economy, race authorities have not changed.

Minister came by the block that is Patch's body and soul when a customer returned his engine with a hole in its side, late in the 1970s. 'The customer had run this one into the ground,' says Fuller. 'Engines need to be rebuilt after every 10hours' running, but this bloke kept stretching it and stretching it until a connecting rod broke and punched a hole in the side of the block. People always want a quick turnaround, so rather than waiting for the block to be repaired, he asked us to rebuild his engine around a new block. Then he could carry on winning without delay. We were short of room, so the old block had to be left outside.'

Years ago it was common practice to leave an iron casting in the open to 'weather' – and so



**Minister's Graham Fuller refuses to get one-eyed about engine Patch**

relieve internal stress – before it was used in an assembly. BMW did this regularly with the four-cylinder blocks it used as the basis of Formula One's most powerful engine. But for everybody who claims that a weathered block is vital, there is a highly-qualified technician to point out that modern casting has improved so much that such claims are mumbo-jumbo.

Formula Ford engine builders can be strong in mumbo-jumbo, but cannot afford the luxury of leaving stock lying idle. And they certainly cannot afford unnecessary overheads like brand new blocks blown in testing. But they have to experiment constantly to stay ahead of their rivals, and their science is narrow in its scope. You cannot change the camshaft, crank, clutch, flywheel, connecting rods, pistons, compression ratio, valves, number of valve springs or the inlet manifold of the basic Kent engine. But if you assemble it with a surgeon's skill, it is possible to liberate as much as 20bhp more than the normal 85.

It was two weeks before Formula Ford's world championship, the Brands Hatch Festival, in 1980, when Minister's broken block was brought in from the cold. The hole in the side, at the very spot where the engine had carried its number, was milled, and holes were tapped for bolts to secure a metal patch. This was then sealed with Araldite. Minister tried out his latest ideas with such success that it was decided to give the engine to their works driver, the Brazilian Roberto Moreno, for the festival.

The combination of Moreno and Patch proved so brilliant that they shattered the lap record by nearly half a second on their way to winning the World Cup. People laughed at the patch, but took little notice until another Brazilian, Ayrton Senna, used the same engine to win two British championships before Irishman Tommy Byrne took it to a second World Cup win in 1981. By then the legend of Patch was growing, and it

reached dizzy heights when Julian Bailey romped through the British national championship to give it a hat trick in the 1982 World Cup. Then there was an equally successful season with Andrew Gilbert-Scott. Patch began to be treated as the god of engines. Since then it has carried on winning, with John Pratt in 1984, and Mark Blundall in 1985, and young Stephen Robertson was one lucky recipient this year.

Many are the times rivals have protested and Patch has been stripped down to be confirmed as completely legal. 'They've even claimed Patch wasn't made by Ford,' says Fuller. 'But when he was tested he was found to come from a Cortina. He's an engine with no number, just a fistful of big wins.' Many are the times that Patch has been rebuilt after yet another 10hours spent chasing the chequered flag. But still he carries on winning despite 'fathering' a family of three others at the works in Chatham, Kent. Son of Patch is 633, named after its number, and Tube is an engine which takes its name from an invisible repair.

'At first, we wanted to keep quiet about the patch,' says Fuller. 'We didn't want people to think we did bodged repairs. Even if a customer was ready to accept a patched-up engine, we thought it wouldn't be good for our reputation. Then we decided to promote Patch as a bit of a character. But people made all sorts of claims about Patch's magical qualities, and we decided we would have to prove that he was really no different from our normal engines. So we sent Gilbert-Scott out to race with the hack engine he used for mid-week chassis testing, as Patch sat on a red carpet in the back of his transporter. Gilbert-Scott still won, and we said it was all psychological. But many a young blood would offer us several times the £2800 it costs for our production engines, just to have Patch in the back of his car. We feel we have to refuse because we cannot treat one customer differently from another.'

And what does David Minister make of the magical qualities of Patch? He says: 'Fractions mean everything in Formula Ford. An engine which will get you into a corner faster than the next allows you to win. It's true that relieved blocks are more likely to maintain their integrity than unrelieved ones, which might tighten up as the engine gets hot. I think that perhaps Patch behaves differently from others under pressure, but there's never been anything that I can measure.'

that he was merely taking advantage of a loophole in the regulations, that he had no intention of building an illegal engine. What point would there be, he claimed, in a new engine builder risking his reputation by building a 'bent' engine? "After all," he continued, "motor racing is still a sport. If we were found to be building illegal engines, we'd be cheating a sport. We don't like that." After meeting the man, you would find it hard to disagree.

Indeed, following that dramatic development, Minister worked frantically to build another engine during the following week; and Morgan once again won convincingly. By that time, Richard had already won the BARC's Wella for Men series and also went on to dominate the Festival, held in those days at Snetterton. His exclusion from the BOC series seemed to leave the way clear for Vermilio but, as Ian Titchmarsh wrote in the AUTOSPORT seasonal survey that year: "The smile was soon wiped from Ralph Firman's face when it was found that the Scholar engine in Vermilio's car was as bent as Morgan's — which wasn't very much — and that was that."

The first year, then, was one of great contrast; much was achieved yet there remained that disqualification. In 1975, however, Minister put all behind him as Geoff Lees shattered all the record books in achieving the Formula Ford Triple-Crown with his Minister-powered Royale RP21. To add to the MCD/BRSCC (National Organs), BARC (British Air Ferries) and BRDC (Brush Fusegear) championship titles, Lees also swept up the last Snetterton Festival and, like Morgan before him, claimed the second Grovewood Award.

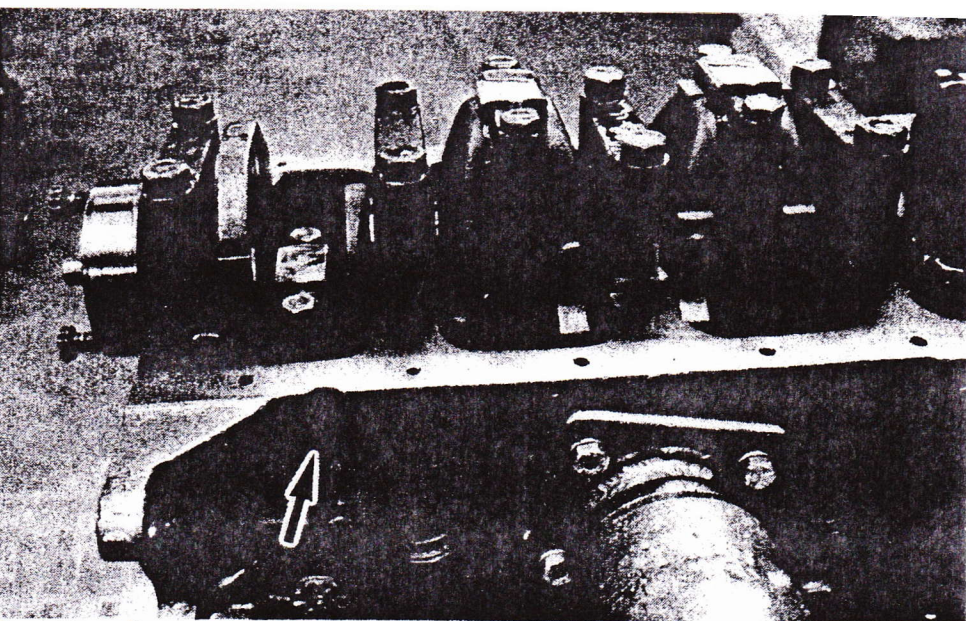
Success such as this led to demand for Minister engines. David was intent on ensuring that the company did not outgrow itself, but did see fit to be joined in partnership by Graham Fuller, who has since then moved away from the shop floor and busied himself in administering the company.

The business has flourished as a result. Fuller, another Kentishman, grew up in similar circumstances to Minister, helping with various locally-based racing teams and itching to get behind the wheel himself. At the age of 18, Graham accepted a job in America helping to establish a dealership for Elden Cars, the company at their zenith after the successes of Tony Brise and others in the early seventies. After just a year, however, the impending fuel crisis brought road racing in America under close scrutiny, so Graham reluctantly returned to England, working briefly with Minister — who was running an Elden car himself at that time — before moving again to Austria to help run the Jim Russell Racing Drivers' School cars. As in the American job, he saw the opportunity to race himself: "Looking after six or seven school cars at two circuits meant that we were flat out all the time," he remembers. "So my time in actually instructing, or driving the cars, was minimal. On the other hand, it did bring very good experience and was quite different to America where everything tended to be rather less serious — remember this was 11 or 12 years ago."

After two seasons on the continent, Fuller reached an arrangement with Minister to work full time in building engines, while at the same time being able to race his own car. It was a whole year before Graham was able to find the time to race himself, thereafter showing some promise during the next two seasons. Then came the crunch: "Basically, I was trying to do two things 100 per cent, but you can never do that. I found that whenever I wanted to go testing, so did everyone else. . . and they always wanted their engines on time. The day came when I had to decide whether the driving would take precedence or I would concentrate with David in making Minister Racing Engines as strong as possible. Obviously, the business couldn't suffer, so I stopped racing."

Over the years, as the interest continued to grow, Graham assumed responsibility for touting new business, keeping himself fully in tune with customers' wishes, and generally ensuring that the business was run efficiently.

"Everyone expects an efficient service," he asserts. "I can't just drop the spanners, come in here, answer the telephone and expect to give a professional service. This isn't a cottage industry any more. It's important when a customer rings up that he speaks to someone who knows what he's talking about. It's the same when I



The most famous Formula Ford engine of them all with an arrow showing the metal patch bolted onto its side.

'phone up someone. I don't want to be fed a lot of bullshit.

It's important that I know exactly what is going on within the Formula Ford scene and I know that the product we're trying to sell. Personal contact is what my job is all about."

We were talking in the smart but functional office of Minister Racing Engines Ltd, situated in a purpose-built industrial estate on the outskirts of Chatham. Some impressive trophies sit atop a filing cabinet, behind which, through a window, can be seen the heart of the company: the shop floor. Immaculate, and with their own dynamometer hiding in a thick-walled compartment to one side, David Minister, machinist Vic Parsons, engine builder Phil Price, and trainee David Bettell, each have their own benches, while a row of completed engines await collection in one corner. With the Festival only just over one week away, of course, this is perhaps their busiest time.

Minister moved to their current impressive premises in December 1981, since when the company has grown steadily and quickly. A turnover of £65,000 in their final year of trading at their cramped old workshops in Dartford has shot up almost three-fold since then, the company showing increased professionalism in keeping with the change in emphasis of FF1600. "We came here for a good reason," continued Fuller, "because we're within five minutes of the M2 motorway from Dover to London. This position is ideally suited to our continental customers and also only 25 minutes away from Brands Hatch."

A larger part of their business is now taken up with foreign customers, due in part at least to their looking to the future: an offshoot that is keeping Minister busy is the preparation of the Ford cvh engine for the Fiesta series, including Mike Smith's Ilford example below.



remarkably successful 1983 season, in which Minister engines claimed no fewer than 17 championship titles, rounded off with Gilbert-Scott's Festival success. And, as Fuller is anxious to point out: "Patch didn't win all those championships for us, believe me. All our customer engines are built to exactly the same specification as our own engines. It's just that one particular engine which seems to rev more freely than most. Another point is that we are in total control of Patch and our three other works engines. We only lend them to teams who we know will use them to our instructions. For example, they're never used for testing, so we keep the mileage to a minimum."

Away from Formula Ford, Minister have produced a few 2-litre engines — notably the one with which Syd Fox and The Old Nail (an ageing Palliser) swept up the major national championship title in 1978 — but prefer to concentrate on FF1600 and allied formulae such as Clubmans B-Sport and the Ford Fiesta Challenge, which has taken up much of their time this year. "As a progressive company," continues Graham, "we're looking to the future. The cvh engine is here to stay and I imagine that, sometime in the future, this engine may come into Formula Ford. I went to America again two years ago — to Ford's Detroit factory — and saw a production line of cvh engines, so I could see what they were doing. It was very interesting."

Minister's cvh engines have notched up several successes in this year's Fiesta series, with Mike Smith and Barrie Williams in particular, but it is Formula Ford which still commands the bulk of their time. Witness Minister's recently introduced ignition management system: "We're just keeping pace with the Ford Motor Company. They're advancing their technology by using engine management systems and the like and while we're not doing that, of course — that would be illegal — our ignition system uses the very latest technology."

Next weekend, Minister Racing Engines will be seeking their eighth Festival victory, their fifth in succession. John Pratt will shoulder the responsibility of using Patch, while another of their favoured runners will be European champion Gerrit van Kouwen, whose Fleetray Racing Lola will run another of the 'factory' engines, either 'Son of Patch', 'Tube' or '633'.

Without a doubt, Minister owe much to the amazing story of Patch, although Graham also admits to a touch of embarrassment: "There are some people who say, 'Ah yes, they build Patch but their other engines aren't anything like as good'. That's ridiculous. I tell you I could give any one of our customer engines to John or Gerrit and they would still win the races; without a doubt."

"I suppose Patch is a bit of a freak, really. I mean if we'd sent it back to that original customer with a metal plate over that hole in the block, they'd have laughed at us! How can you build an engine with a great big hole in the side of it? I know if I was sitting in your chair I'd think this is a right fairy tale. But it isn't."