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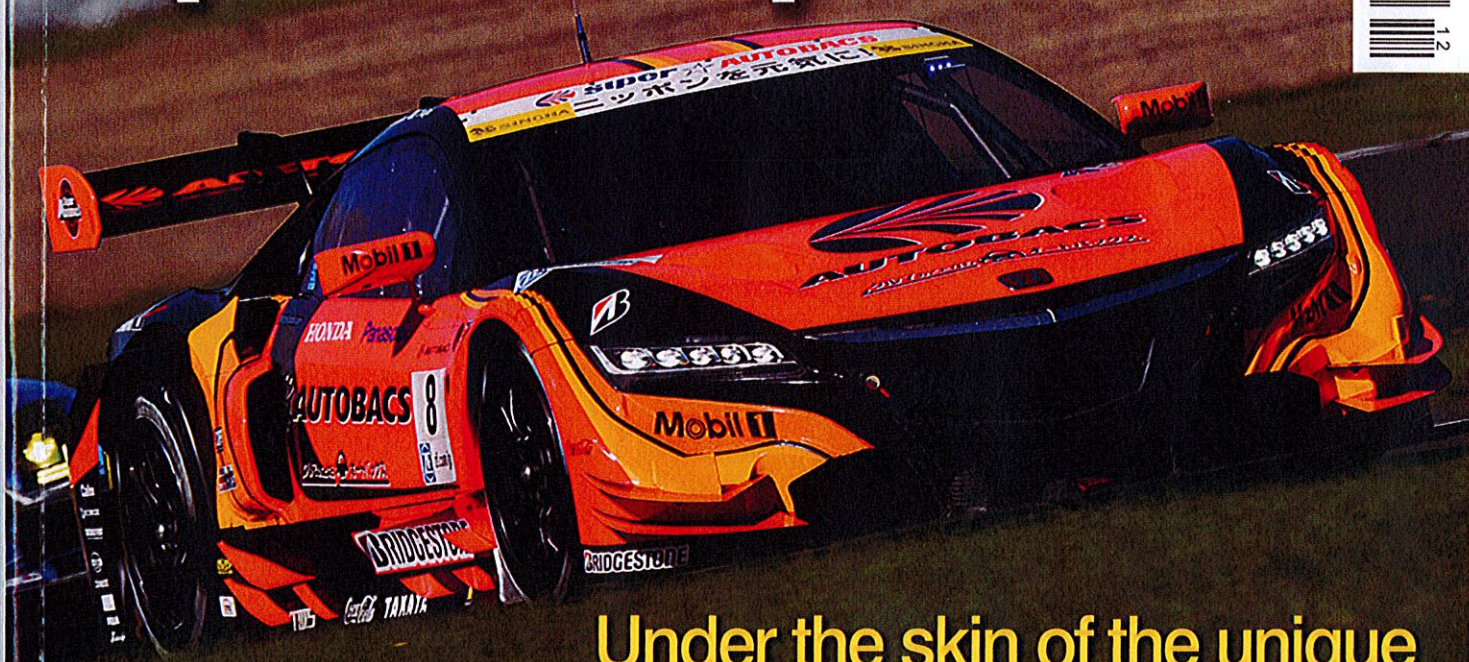
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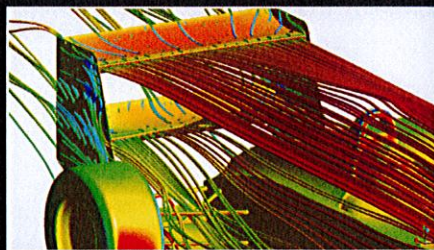


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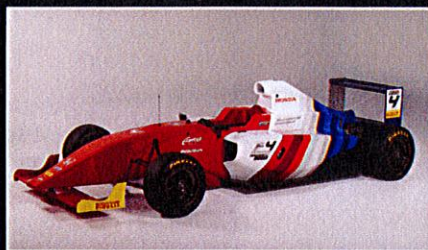
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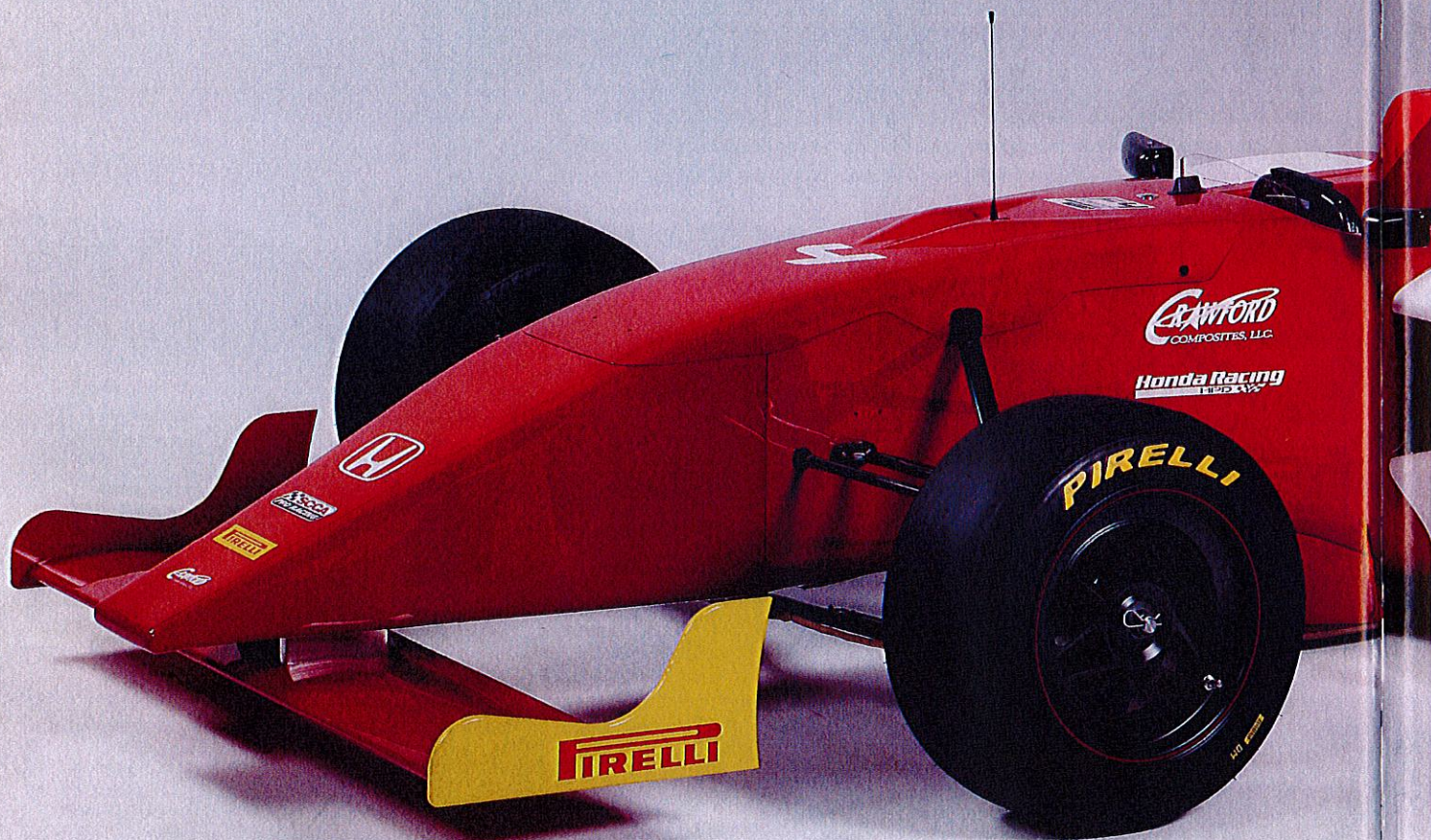
US Formula 4

Crawford and Honda pair up for single seater series

Formula 4-tune

Crawford Composites has secured the chassis supply deal for US F4 – and with series for both east and west coasts mooted it could prove lucrative

By ANDREW COTTON



FIA Formula 4 racing will arrive in the US in 2016 with a 15-race professional series organised by the SCCA across five venues. The F4 United States Championship will join FIA Formula 4 championships already established in Australia, China, Germany, Italy, Japan, northern Europe and the United Kingdom, with other new championships to be launched in Mexico, Southeast Asia and Spain.

Each market has its own technical partners and in the US it is Crawford Composites that won the tender for the new series, with Honda providing its K20 C1 2.0-litre engine – which will produce the FIA-mandated 160PS (158bhp).

The car Crawford will produce is widely based on the FL15 that the company made for the Formula Lites series, which was its first full car since 2009. But there are aero tweaks and some modifications that needed to be made in order to stick to the FIA-mandated price cap for the series; \$45,000 for the chassis, including paddle-shifters, data acquisition and camera. The Honda engine will carry a one-year lease price of \$6600, while the Pirelli tyres will be priced at approximately \$250 per tyre, with a maximum of three fronts and three rears per race weekend.

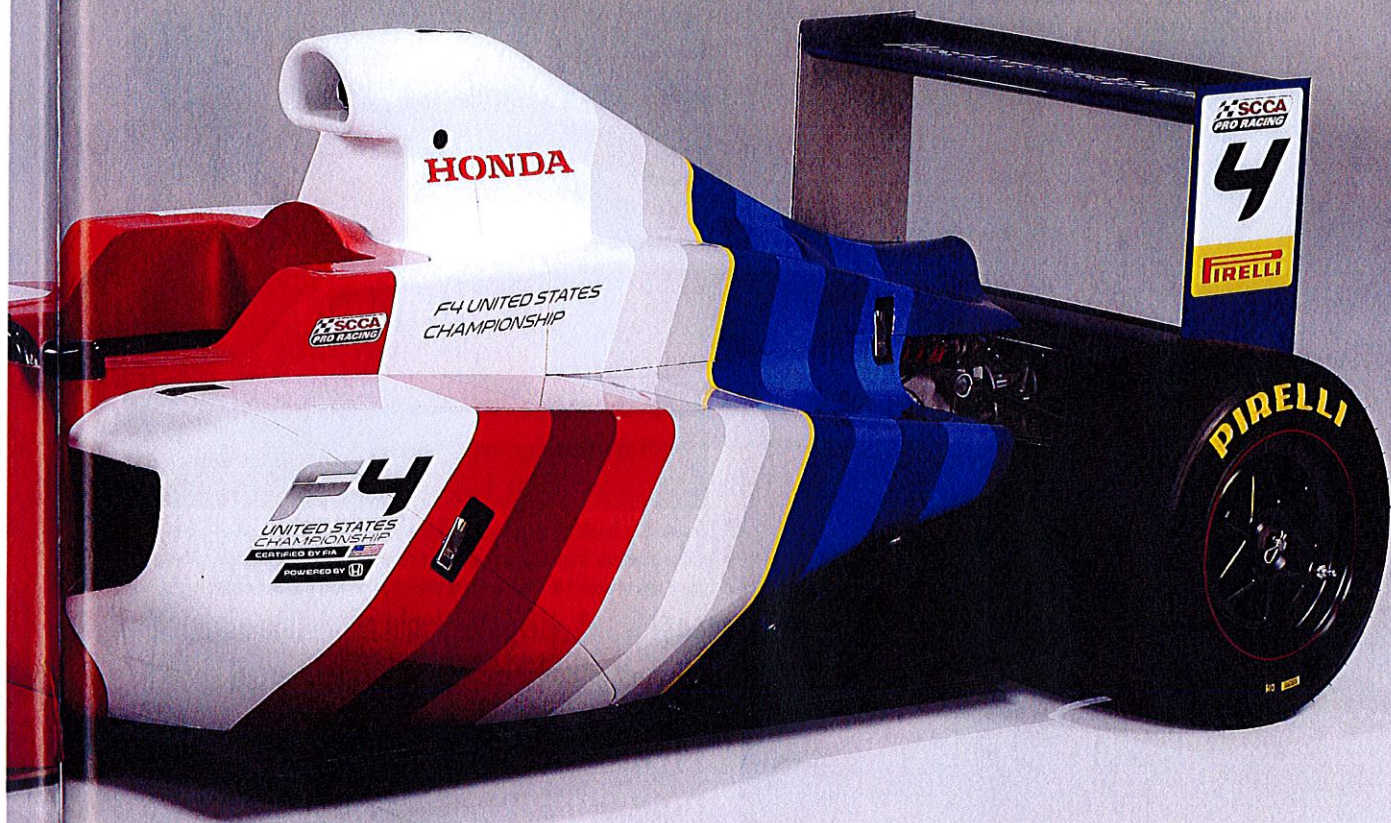
F4 is, according to Stefano Domenicali, president of the FIA Single Seater Commission,

a cost-effective single seater category and the proposal for a World Cup for Formula 4 cars has already excited the market. The question this raises is, of course, who will provide the cars, or will each market provide its own chassis and create a multi-brand F4 series?

Profit potential

Whatever happens on the world stage, the American F4 series could be one of the most lucrative contracts to be secured in the fledgling category, because although a single series is proposed initially, in order to keep the travelling costs under control there's the real potential for east and west coast championships.

Crawford Composites has based the Formula 4 car on its FL15 Formula Lites car, and meets the cost cap set for the series. Its order book for its Honda-powered racecar is already beginning to fill



'Not everyone can afford our Formula Lites car, which is \$120,900; but this chassis is less than \$50,000! That's a big difference'

North Carolina-based Crawford Composites unveiled its Honda-powered F4 racecar at the Circuit of the Americas in September, with 12 of them scheduled for delivery for the first season in 2016 and all of them already accounted for.

As mentioned, Crawford's car is based on its FL15, built to the 2014 FIA Formula 3 technical regulations. The Formula 4 car is a little narrower than the FL15, and does not have the aero tweaks of its older brother, but does share a commonality that has helped to drive down the cost of production.

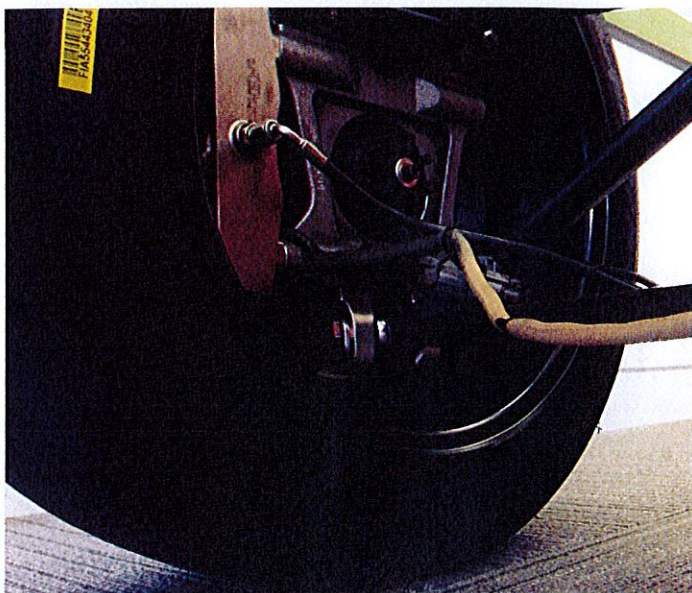
'The F4 regulations are very specific, so we have to do the chassis absolutely to the championship regulations,' says Crawford's

aerodynamic engineer, Catherine Crawford. 'The basic construction is the same with a carbon fibre tub and the intrusion panels, so it is a little bit of a different shape but is generally the same. The F4 has a drop nose, the wings you have to do the same as everyone around the world so they are metal, which is really odd for us.'

While the FL15 carries aerodynamically sculpted wishbone suspension, the F4 package will have a more standard layout. 'The geometry will be similar, but we can't do [the sculpted wishbones] because we have to meet the cost cap,' says Crawford. 'It will feel the same, the geometry will be very similar but it will not have aero tubes.'

The final specification of the car was not yet finalised as the US F4 was launched, but the company subsequently signed a deal with Sadev. The FL15 has a Hewland gearbox, but that was considered to be too expensive for F4's very restrictive cost cap of around \$115,000 in 2016. This also meant that Xtrac was out of the running, and it seems likely that the car will feature the favoured Sadev gearbox.

Crawford's involvement has come about principally due to its relationship with Honda with which it partnered with the Lites car. 'We had such a great relationship with them for that car, and it was really that car that got us thinking about this,' confirms Crawford.



The car has been set up to allow for a little tweaking here and there, not only for drivers to learn the nuances of developing a car, but for the young engineers who also need to learn their craft



... Likewise the wooden floor, which adds weight but on the other hand is cheaper to make and to replace, so while it may seem a little agricultural for a modern racecar it should be effective



Crawford specialises in carbon composites so for it to make a metallic, and rather impotent, front wing was an alien concept for the organisation, although one it had to accept in order to meet the FIA's Formula 4 specification ...

The Formula 4 category is also designed to cater for new engineers working with downforce cars for the first time

The 'Lites' engine will last a full season, and nothing less is expected of the Formula 4 engine either. 'We are pleased to partner with the FIA and SCCA on the launch of the United States Formula 4 Championship series, which further reinforces Honda's long-standing commitment to open wheel racing in America,' says Steven Eriksen, vice president and COO at HPD (Honda Performance Development). 'The new Honda K20 engine will provide a fun, reliable and cost-effective solution to power the dreams of racers honing their skills for a future in racing.'

The right decision

For Crawford, the decision to return to full car construction is a welcome one. The company considered a tender for the new North American LMP2 chassis deal, but opted for the Formula 4 car instead, and expects to produce a significant number of cars for its series.

'We have been doing a lot for other people, chassis and bodies, and some of the chassis work for the LMPC cars that are out here,' she

says. 'We have done a lot, but not a full car since 2009, before the FL15.'

Crawford is not underestimating the task ahead, though: 'Based on the interest that we have had [for the F4], it is a little frightening. We have to ready 12 cars for next year, delivered in time for the beginning of the season. That is what we have committed to. I know Sim Raceway have the first six. There are a couple of other people that have committed to more, and some schools that have expressed an interest, and that is a big number. A few guys in the FL15 want to run them alongside each other, and that makes sense. The kids that are in there, we have people from all over the world. It is international, but not everyone can afford that car, which is \$120,900; this is \$50,000! It is a big difference.'

Electric connection

A partnership with electronics manufacturer GEMS has allowed the Crawford team to combine the electronic and gearbox control units into one complete unit, reducing the price,

and 'making it so that everything is controlled through one unit which is great especially for these classes where you don't want people messing with too much stuff,' says Crawford.

However, the category is not only about providing a step up from karting for the driver; it is also designed to cater for new engineers working with downforce cars for the first time. Crawford has designed the car to be open to adjustments, despite the rather impotent and heavy wing at the front.

'The worst thing for me is to have a driver who can't talk to me,' says Crawford. 'It is hard enough when you get a driver who doesn't speak the same language, you have to learn each other, but once you do and you click, it is amazing. Yet, this has to be cost-effective, so the wishbones are interchangeable side to side on the top, the uprights are the same all the way around the car. The minute you make those things the same, the costs come down.'

'There is a slug in the wheel assembly, so all you have to do to change the roll centre is

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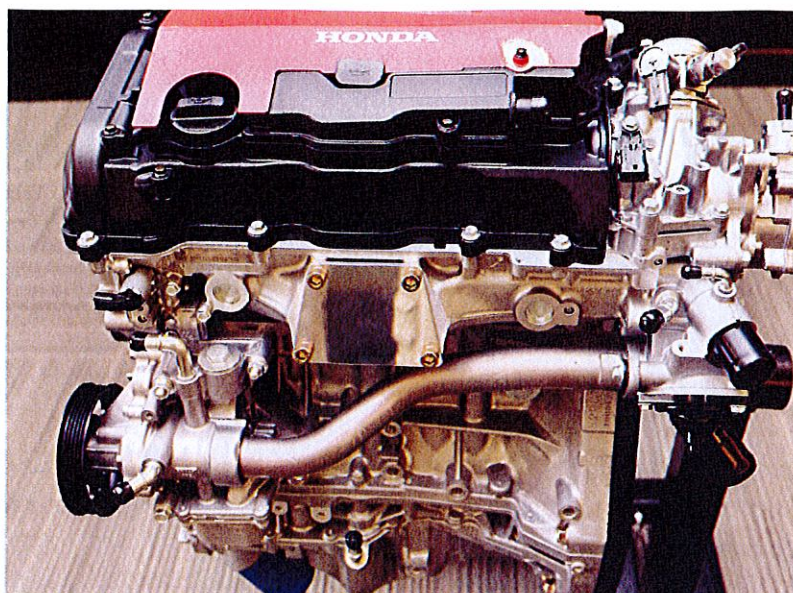
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FORMULA 4 – CRAWFORD COMPOSITES



US Formula 4 will be powered by the Honda K20 C1 2.0-litre engine which will give around 160bhp, the maximum power mandated by the FIA. Crawford has previously worked with Honda with its Formula Lites car

change the slug. It is cost-effective. It doesn't cost me any more to be able to do that so I can still make this a car that I can engineer and play with, and they can learn.

'We learned that with the FL15 – they have roll centre adjustments, anti adjustments, spring adjustments. I don't want a driver who can drive but can't tell me anything. That's not useful. What's the point in having a ladder series if they are not going to learn anything?' Crawford says.

'With the FL15, there was a lot of adjustments in the wings, so that is different, but we have had guys stepping into the FL15 who have never driven downforce before and so when I ask them how's the aero balance, they have no idea. It is probably not a bad idea for them to step into this, feel downforce for the first time with a balance so that when they do step up into the next class, and they can adjust it, they understand what they are adjusting because right now, some of them don't.'

The car has yet to see a wind tunnel, but the plan is that it will before the company starts to deliver cars. But the development has to be limited as the performance is expected to closely match that of similar cars in other markets around the world.

However, as mentioned, at the launch of the series a World Cup idea was tabled. So if the cars have to go head-to-head, development time now could prove to be fruitful in the future. 'That will be interesting,' says Crawford. 'That's the first I have heard about that. That would be very interesting, and exciting.'

TECH SPEC

Crawford F4-16 Formula 4

All new single seater for use in new-for-2016 United States Formula 4 Championship

FIA certified monocoque: 2016 F4 specification. Carbon composite monocoque; front and rear roll-over structure; anti-intrusion side panels

Engine: Honda Type R 2.0-Litre, normally aspirated

Electronics: GEMS Performance electronics; LDS3R display; EM80 ECU; MPI Steering Wheel

Gearbox: Sadev 6-speed sequential; tripod CV joints; Crawford pneumatic paddle-shift

Brakes: Brembo 2-pot callipers; Brembo discs; Tilton adjustable pedal box; cockpit adjustable brake bias; accessible fluid reservoirs

Suspension: double wishbone, front and rear; pushrod adjustable ride height; adjustable anti-roll bars; adjustable shocks; Eibach springs; Aurora Bearings

Tires: Pirelli

Wheels: Jongbloed

Steering: Titan rack and pinion steering; quick release steering wheel; height adjustable column which is also collapsible for safety reasons

Electrical: starter motor; sealed battery

Bodywork: lightweight composite bodywork with adjustable wings front and rear. Engine air intake with filter

Safety: FIA specification 6-point harness; on-board fire suppression (Lifeline); HANS compatible headrest; nosebox crash structure; rear attenuator; wheel tethers

Dimensions

Wheelbase: 108in

Width: 69in

Weight: 1254lbs

'I don't want a driver who can drive but can't tell me anything. What's the point in a ladder series if the drivers are not going to learn?'