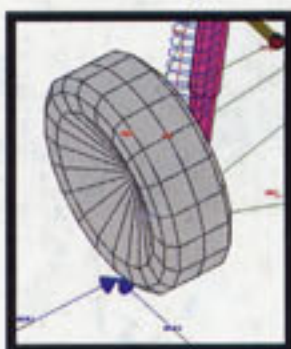


Racecar engineering



**KNOWLEDGE
IN A BOX**
New suspension
software brings Lotus'
know-how to racers



**RACECAR
SET-UP TOOLS**
Guide to buying the
right equipment for
chassis alignment

February 2005 • Vol 15 No 02

www.racecar-engineering.com

UK £4.50 • USA \$8.95

STOHR D Sports Racer

Wheelbase: 96in (2438mm)

Overall Width: 65in (1651mm)

Weight: 775lb (352kg)

If Radical started the revolution, it was Stohr that capitalised on it by creating the first factory-built car designed specifically to dominate the class by taking full advantage of the rules. The result has been a couple of impressive victories at the SCCA Runoffs in races that have been dominated by Stohrs.

The Stohr DSR is based on managing director Lee Stohr's previous Formula Ford designs, with the necessary changes to make the car a Sports Racer. The biggest change is a switch from a purely tube steel frame to a semi-monocoque 4130 steel tube frame that includes a tub made of 1in thick carbon fibre composite panels in the cockpit area. 'I came up with a semi-monocoque design that is part steel tube and is part carbon and honeycomb,' Stohr said. 'It is designed to be repairable. We've had two guys who had big crashes and they've been fine and the cars were repaired. I think it is a lot better than just a steel tube frame. It is pretty much like a Formula Atlantic tub, but the carbon is not as thick.'

Because the SCCA requires FIA crash test certification for monocoque designs, the carbon tub is only a part of the car. 'It is a structural part of the centre of the chassis,' said Stohr. 'There is enough steel tube in there that that SCCA allowed me to homologate it as a steel tube frame.'

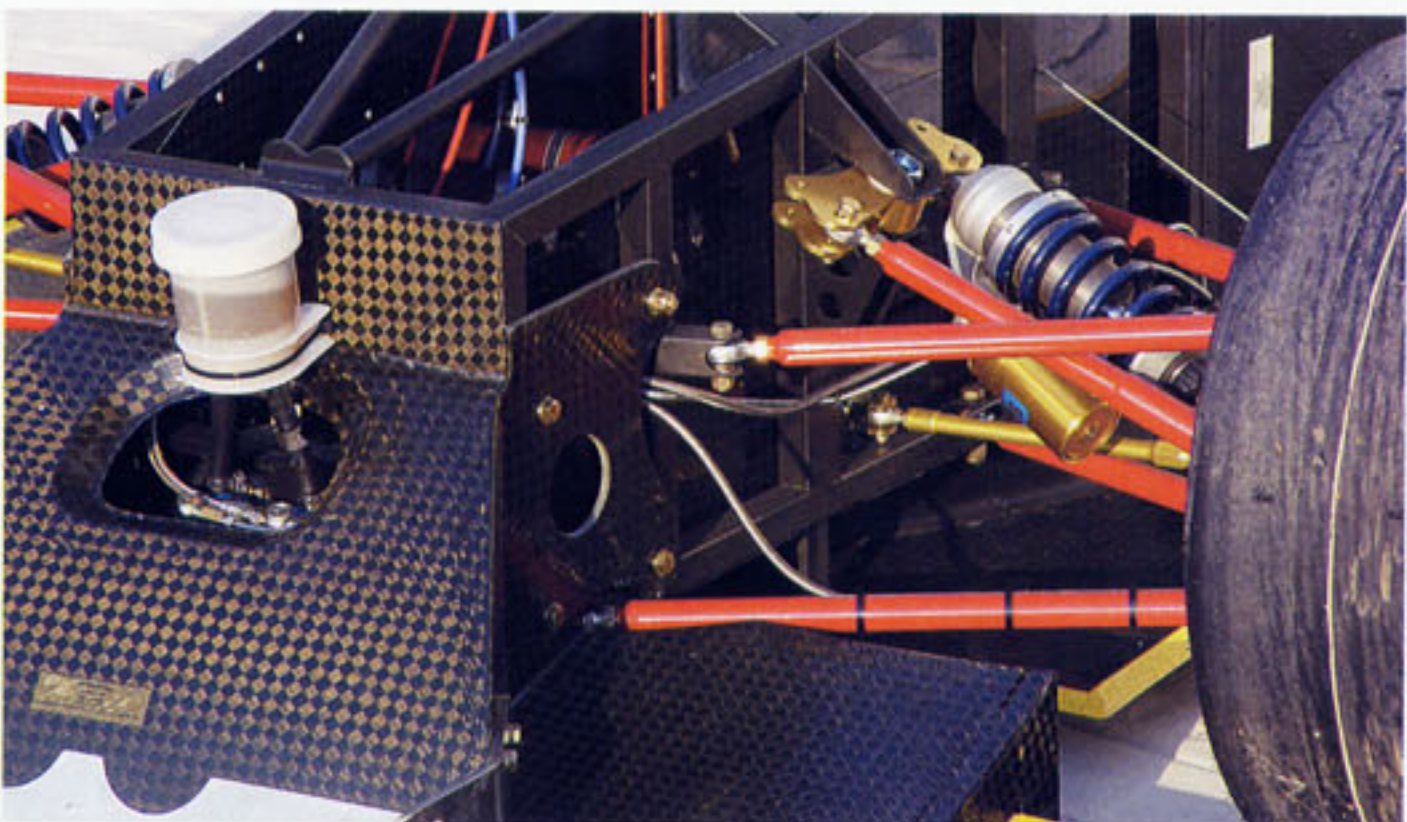
Another innovation is the front suspension which, rather than using a conventional pushrod acting on a bell crank to the damper, employs a 'double-acting' configuration. It is an outboard damper connected to a bell crank that has a conventional pushrod mounted on the opposite end. 'Both ends of the shock move, to increase the motion ratio, so you get twice the shock travel. I wanted a 1:1 motion ratio between the wheel and the shock. That is kind of hard to do with an outboard spring and shock because the angle isn't very good.'

Stohr's car initially used Penske dampers, but he has since switched to Ohlins, which is helping optimise the valving to suit the car. 'I'm working with Ohlins, on their seven-poster rig in North Carolina,' Stohr said, 'and they are trying to provide valving that gives maximum tyre grip.'

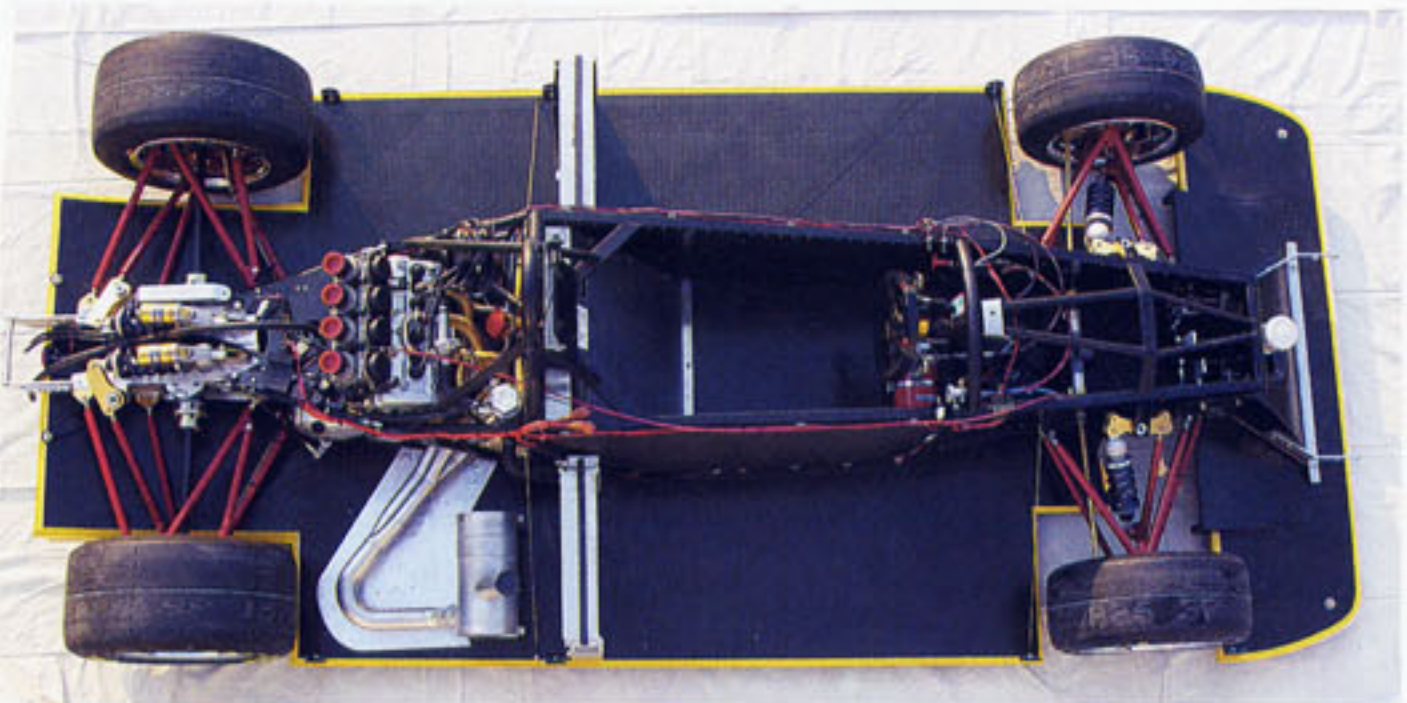
Another unconventional aspect of the Stohr's suspension is the absence of anti-roll bars, Stohr preferring to control roll with dampers and springs. This position defies



DSR which uses a part steel, part carbon fibre construction. Here with carbon body



The Stohr DSR has an unusual outboard damper/pushrod front suspension design to increase the dampers' motion ratio



Without bodywork, the formula car roots of the Stohr design are apparent. The paddle gear shifter is just visible here

conventional wisdom, but is supported by their success on track. 'My philosophy is that for any given engineering problem there are many pathways to the solution.'

Stohr has delivered 40 Sports Racers so far, of which 33 were in DSR configuration. One feature that lends a modern feel to the Stohr's operation

is a steering column-mounted paddle shifter that lets the driver change gears with both hands on the steering wheel. The shifter connects to the motorcycle transmission's shifter shaft via cables.

www.stohr.com

