www.usatoday.com
USA TODAY
Sports
SECTION C
Wednesday, June 25, 2008

By Erik S. Lesser for USA TODAY

Tampa Bay prospect: Tim Beckham was drafted by the Rays.

All-USA selections

The All-USA high school baseball team includes infielder Tim Beckham of Griffin High in Georgia, the No. 1 pick in this year's major league draft, 7C

Motor sports

Series gives drivers environmental challenge

American Le Mans seeks green teams

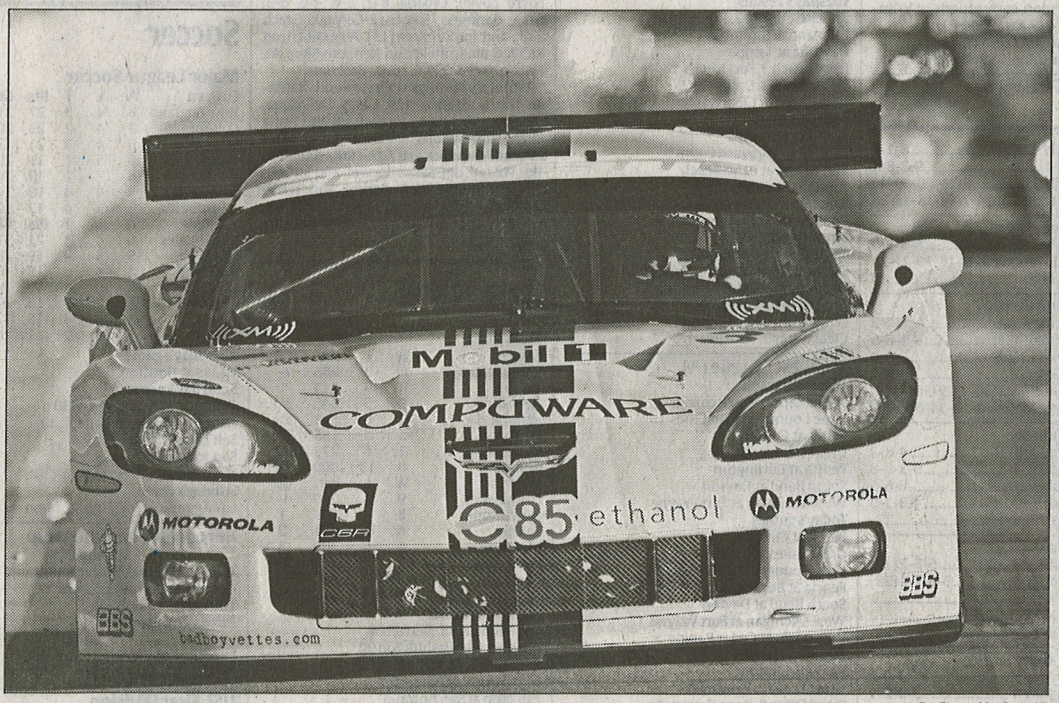
By Nate Ryan
USA TODAY

The American Le Mans Series designed its new Green Challenge — a test of fuel efficiency to help the environment — in part to put the automobile back in auto racing.

Your automobile.

"There was a time the technology trickled into street cars, but that came to an end," Corvette driver Johnny O'Connell says of an era when rearview mirrors and lightweight parts made their way from racetrack to the road.

"In the ALMS, we're getting back to that. Lord knows we're all looking forward to when we can run our car on a banana peel and a milkshake. But until they come out with the Mr. Fusion flux capacitor from *Back to the Future*, we're doing the best we can."



By Steve Nesius, AP

Aiming for better: American Le Mans Series driver Johnny O'Connell says the future will produce more efficient cars that are more environmentally friendly, but until then, "We're doing the best we can."

Today, the ALMS will unveil the Green Challenge, an environmental competition that will make its debut at the Petit Le Mans on Oct. 4 at Road Atlanta and become a full-season feature in 2009. In addition to rewarding teams on the basis of finishing positions, cars also will be evaluated on performance, fuel efficiency and environmental impact under a formula that encompasses more than 30 categories.

The event's trophy, being commissioned by the Department of Energy and the Environmental Protection Agency, will go to the fastest car that goes farthest while minimizing energy use, petroleum and greenhouse gas emissions.

Because the series' manufacturers are "as much if not more interested in environmentally motivated innovations as performance," ALMS President Scott Atherton says the challenge should produce plenty of street-car spinoffs: "We have manufacturers already looking at leading-edge technology that will appear on the racetrack with the full intent of being developed rapidly for the road car. If you build a more fuel-efficient car that produces less emissions, people paying $4 a gallon (for) gas will beat a path to your door."

Audi, Porsche, Acura, Mazda, Ferrari and General Motors compete in the ALMS, and Atherton says another major manufacturer is considering the series because of renewable fuel technologies that can be applied to production cars.

"By virtue of the number of manufacturers committed to participate, I would suggest we're on to something here, because it's being embraced," Atherton says.

Bob Larsen, a senior technical staffer at the Department of Energy's Argonne (Ill.) National Laboratory, says teams will focus on "regenerative braking" — a way of recovering energy that is a staple of hybrid vehicles — and capturing greenhouse gases. Larsen, who helped devise the Green Challenge formula, says the adverse conditions of ALMS' endurance races (which last up to 12 hours) offer the best "real-world" testing.

The ALMS began switching to alternative fuels in 2006 and now races on sulfur-free diesel, E10 (gasoline blended with 10% ethanol) and cellulosic E85. Corvette Racing went to cellulosic E85, made from waste wood, this year. The team won its first race on E85 at St. Petersburg, Fla., in April.

"Performance was a big concern because we want to win," O'Connell says. "But we're as fast as ever."

Atherton says the green initiative won't detract from its most important colors: the black and white of a checkered flag. "We have fantastic racing and won't do anything to take away from it. This is icing on the cake for manufacturers."

www.usatoday.com
USA TODAY
Sports
SECTION C
Friday, August 29, 2008

By Robert Deutsch, USA TODAY

Boston tops: The Sox auction Monster Seat tickets online.

The best of the Best

Our Best Seat in the House series reaches No. 1 in the top 10, and it's held by the Monster Seats atop the 37-foot left-field wall at Fenway Park. Sit back and enjoy the view, 6C

Corsa's hybrid debuts Oct. 4

By Nate Ryan
USA TODAY

A car owner in the high-tech American Le Mans Series, Steve Pruitt is a fan of the U.S. space program. He likes to compare Corsa Motorsports' new venture — fielding the first Le Mans Prototype hybrid — as a small step for motor sports that eventually could have large benefits for mankind.

"To go to the moon, you've got to go up and orbit the Earth a couple of times, and that's what we're in the process of doing," Pruitt says.

Corsa's LMP1 will be the first of its kind in the ALMS, running on a combination of an E10 ethanol-fueled internal-combustion engine and an alternating-current electric motor. The team built the power plant with help from the Zytek Group, a company based in Britain that has experience in Formula One and A1GP as well as on hybrid and alternative-fuel technologies for street cars with prominent auto manufacturers such as General Motors.

The engine will make its debut in the Petit Le Mans on Oct. 4 at Road Atlanta, where the ALMS also will roll out its Green Challenge initiative, which will evaluate cars on performance, fuel efficiency and environmental impact.

The ALMS says it has made "green racing" a primary objective, and series President Scott Atherton said at least two other manufacturers — including a "household name" not racing on the circuit — are developing hybrid models for ALMS competition that are designed to help improve its street-car technology while flaunting it on the track.

Pruitt, though, isn't expecting the new hybrid to excel, nor necessarily reach the finish of its first 12-hour endurance event. Corsa is using the Petit Le Mans and the Sports Car Championships in Laguna Seca, Calif., on Oct. 18 as testing for making a splash at the 12 Hours of Sebring in 2009.

"These two races is an opportunity to sort out things," Pruitt says.

THE WALL STREET JOURNAL.

Hybrid Race Car Planned For Endurance Series

By **JONATHAN WELSH**
August 29, 2008

DETROIT – A racing team competing in the American Le Mans Series endurance-racing program plans to unveil a hybrid car today.

The car, a prototype called the Corsa Zytek Hybrid, is the result of a partnership between the Salt Lake City-based race team Corsa Motorsports and Zytek Group Ltd., a U.K. automotive engineering and electronics company with offices in Novi, Mich. It competes in a series of races in North America and Europe that range in length from just under three hours to 24 hours.

Zytek's products include components for hybrid passenger vehicles, so the technology on the racing car could trickle down to vehicles on the road in the future.

"This car represents the next step in hybrid technology, says Scott Atherton, chief executive of the American Le Mans Series. He noted that the use of hybrid power in racing highlights its potential to increase performance as well as fuel economy.

The Corsa Zytek Hybrid will compete in the American Le Mans Series.

The Zytek car's top speed is over 200 miles per hour and the electric motor adds about 50 horsepower to the 625 horsepower eight-cylinder engine that runs on fuel that is a mix of 10% ethanol and 90% gasoline which is similar to most pump fuel in the U.S.

Steve Pruitt, who heads Corsa Motorsport, says the car uses lithium-ion batteries that add relatively little weight to the car. The team had to add ballast to the car to bring it to the required minimum weight. Still, Mr. Pruitt says the batteries are the car's "Achilles' heel" because it is unclear how they will perform in the harsh conditions of endurance racing. He plans to race the car for the first time in the Petit Le Mans race Oct. 4 at the Road Atlanta track in Braselton, Ga.

Ten years ago, specialty car maker Panoz Auto Development also teamed with Zytek to develop a hybrid electric race car called the Q9 that was similar to the Corsa Zytek, says Mr. Pruitt. But its batteries weighed hundreds of pounds and the Q9 – nicknamed Sparky -- failed to qualify for a race. Mr. Pruitt says he has been calling his new car the Q10 out of respect for that early effort.

Automobile racing has long been touted as a hotbed of research and development that eventually finds its way to cars consumers can buy. But today series like Nascar's Sprint Cup use technology that is crude compared with that found in the typical family car.

American Le Mans officials say companies that race in their series, including Volkwagen AG's Audi unit, General Motors Corp. and Honda Motor Co.'s Acura brand are developing systems that will appear in road cars within a few years. New diesel road cars from Audi and Volkswagen burn cleaner and have surprisingly high horsepower and fuel efficiency, in part because the fuel systems and engine-control electronics were developed on the track in Audi's diesel-powered R10 race cars.

The Corsa Zytek hybrid, the Audi diesels and other race cars powered by E85 are part of what the series calls the Green Challenge, which awards prizes for efficiency.

Mr. Atherton of American Le Mans says the Corsa team's effort is the beginning of widespread acceptance of hybrids. "I think hybrid power will soon be part of the automotive fabric across the board."

Write to Jonathan Welsh at jonathan.welsh@wsj.com.

Diesel versus diesel & diesel versus gasoline

Source: Race Engine Technology

Publication Date: 11th August 2008

Diesel versus diesel

At Le Mans in 2007 Peugeot had a slight edge over Audi in qualifying but it had to turn down its horsepower on race day to take the strain off, not only its engine but also its transmission, its wheel bearings and so forth. It wasn't surprised to have to play second fiddle to Audi and was more than happy to get a car home in second place.

In 2008 it was different. Peugeot had some additional horsepower in qualifying but more significantly it had the ability to race at its 2007 qualifying pace. There was no inherent reliability issue and its race pace was slightly superior to that of Audi. Not enough to dominate in the manner of qualifying; just enough to stay ahead, at least in the early stages. As the race progressed two other factors came into play. One was rain, which nullified the Peugeot speed advantage while the other was inferior fuel efficiency, which cost Peugeot more time than Audi in pit lane.

Audi's race day speed was sufficient to keep Peugeot in its sights in the dry. That is to say, the most competitive of its trio of R10s, could keep in sight the least competitive of the trio of Peugeot 908s. As it transpired, that was the only 908 to have a trouble-free run. The rain came shortly after half distance and at that stage the eventual runner up held the lead, on the same lap as the eventual winner. The precipitation soon reversed those positions yet the outcome remained in doubt until the final hour.

Audi's open cockpit R10 has a superficially similar 5.5 litre V12 turbodiesel engine to that of the closed cockpit Peugeot 908 and on this occasion both Le Mans Prototype engines looked to be exploiting around the same amount of horsepower (700-plus), at least in the race. Both engines are excessively heavy by race engine standards – in excess of 200 kg – and that means neither car is ballasted to the minimum permitted LM P1 900 kg and that neither has an ideal weight distribution. Both Michelin shod cars have more weight than is ideal on the rear, the 908 to a lesser extent thanks primarily to a slightly more forward engine location.

In dry conditions the 908 makes slightly closer to optimal use of its Michelin tyres. However, on this occasion once rain had reduced lateral grip, the R10's more rearward weight bias was no longer a disadvantage, if anything it was the opposite, enhancing longitudinal grip at a time when the cars are most prone to wheelspin. Theseturbodiesels have vast amounts of horsepower at low road/engine speeds and getting that to the ground once grip levels deteriorate is a major issue.

At the same time with the rain initially occurring in the dark, the superior visibility then afforded by the R10's open cockpit was an advantage over the full enclosure of the 908. Moreover, the Audi was running more compliant suspension settings, which paid dividends once the grip level fell while the spray caused the 908's radiators to clog with rubber and dirt debris, leading to uncomfortable oil and water temperatures. The drivers were told to 'take it easy'; the mechanics lost vital seconds purging the

radiators. So it was that inclement conditions over the second half of the race nullified Peugeot's edge in terms of pure speed and ensured that Audi's advantage in terms of fuel efficiency could pay dividends. But where did that advantage come from?

The 908 has had just as sophisticated aerodynamic development as the R10: there is nothing to suggest that it is any less efficient in this respect. When it comes to mechanical grip, the 908's more forward weight distribution is what the tyres need; reduces sliding.

On the other hand since the R10's weight distribution can reduce wheelspin let us call this aspect quits in terms of fuel expenditure. Likewise there is nothing to suggest that either car suffers more pronounced losses through its powertrain. All of which suggests that the R10's superior fuel efficiency is the product not of chassis but of engine development.

When it came into the LM P1 arena, Peugeot not only followed Audi in exploitation of a 5.5 litre V12 turbodiesel, it likewise went to Mahle for its pistons and to Bosch for its common rail fuel system. The technology of the piston and of the fuel system are at the heart of turbodiesel engine development. Initially Mahle supplied an aluminium alloy piston but for 2008 it has made available a steel alternative – lighter and more heat resistant. For Le Mans Audi stayed with its proven technology whereas Peugeot embraced the new steel piston.

Peugeot's development around the steel piston netted it superior ultimate horsepower, which, combined with its superior weight distribution (better use of essentially the same Michelin tyres) made for an easy run to pole. However, to feel comfortable about its ability to finish only its second ever Le Mans of the modern era, Peugeot turned down the wick for the race. The steel piston was no longer a factor.

Meantime, it appears that Audi has taken the lead in the exploitation of higher fuel pressure. Bosch initially supplied both Audi and Peugeot with a 2000 bar system but more recently it has developed a system that can cope with 2500 bar. That was a major technical challenge, and for the engine engineer, it isn't just a case of bolting on the new system and enjoying the benefits of higher pressure. It is a case of developing the engine around higher pressure, which can net higher power and/or superior fuel efficiency. Audi has taken the efficiency route, which paid off at Le Mans to the extent that it could routinely run 12 laps to the 11 of Peugeot.

It was a very close run thing, though. The winning Audi made only routine stops for fuel and tyres; likewise the second position Peugeot. But over the course of 24 hours that 908 needed four more stops than the R10. Each stop implies a 25 second refuel plus time lost stopping and restarting and running the speed restricted pit lane; in total each stop costs around a full minute. So the second place Peugeot, which was only 4.17 seconds behind at the flag, had actually lost four minutes in the pits. Thereby was the race won and thereby was the race lost.

Diesel versus gasoline

The Peugeot 908's aerodynamics have been honed using the Fond Tech 'Aerolab' moving ground plane, scale model wind tunnel in Italy. This highly sophisticated tunnel was used by the Toyota Formula One team until its second in-house facility came on stream at the end of 2007. The point is that many Grand Prix teams nowadays find it fruitful to run concurrently a pair of state of the art tunnels to maximise aero investigation. Aerodynamics are no less significant in the world of Le Mans Prototypes. It is just that outside of the major manufacturers – Peugeot and Audi – there isn't a lot of budget to pursue it.

Pescarolo took the third podium position in the 2007 Le Mans 24 Hour race but its gasoline-fuelled, naturally aspirated 5.5 litre Judd V10-engined car was way off the pace of the Audi and Peugeot 5.5 litre V12 turbodiesels, which exploit at least a 100 bhp power advantage due to respective ACO air intake restrictor sizes. This year the best Pescarolo-Judd in qualifying clocked 208.533 seconds versus 198.513 seconds for the pole winning Peugeot but how much of that 10.02-second gap was down to horsepower inferiority?

Where the pole sitting 908 was the fruit of a dedicated moving ground plane scale model wind tunnel programme, the Pescarolo 01 had enjoyed no wind tunnel testing at all. The only aerodynamic development that Pescarolo does revolves around a tiny amount of 'coast down' testing – better than nothing at all, but compared to the Peugeot programme, like a dodo alongside a bird of prey.

A better indication of the current difference between turbodiesel and gasoline engine potential was given by the Lola-Aston Martin, which qualified in 205.158 seconds – some 6.645 seconds from pole and quick enough to outrun the slowest of the trio of Audi turbodiesels. This coupe, which qualified just 1.311 seconds adrift of the quickest Audi, is the fruit of a serious moving ground plane wind tunnel programme, using Lola's sophisticated in house wind tunnel. At the same time this car has more horsepower than the Judd V10 – thanks to its GT1 base, its naturally aspirated, 6.0 litre Aston Martin V12 is afforded air restrictor sizes that on paper give it something like a 25 bhp advantage over the Judd.

In fact, it would seem that the Lola-Aston Martin was exploiting around 670 bhp, the Audi perhaps 770 bhp and the pole Peugeot perhaps 800 bhp. All three cars enjoyed excellent aero and all three were running to a 900 kg limit with the Lola-Aston ballasted up to that and the turbodiesels slightly over it. More significantly, the gasoline car had a superior front:rear weight distribution; better use of its Michelin tyres almost overcame its power disadvantage, at least against the Audi.

Significantly, Jason Hill, the Prodrive Chief Engineer – Race Engines, who oversaw development of the stock block Aston Martin V12 in the Lola says that he would happily trade the air restrictor advantage it has over the Judd for the opportunity to design instead a pure race engine. Notwithstanding the impressive performance of the Prodrive-run Lola coupe, Hill feels that a brand new race engine (for which there wasn't the budget) should be the basis of an even quicker car.

All this puts the perception of the speed differential of the turbodiesel and gasoline LM P1 cars in a new light. What if a third manufacturer enters the fray with a brand new fully optimised gasoline car, as Honda may well do in 2009?

The Audi qualifying pace was much closer to race pace than that of Peugeot. The evidence of the lone Lola-Aston Martin (which quickly crashed on race day but nevertheless was repaired to finish ninth) is that a manufacturer gasoline car wouldn't necessarily be so far off turbodiesel race pace, if having no real hope of pole. Are the current restrictor sizes really as unfair as team owner Henri Pescarolo has suggested?

But we also have to consider long-term development potential. A manufacturer might gain a little more speed from a gasoline car than that shown by the impressive Lola coupe but there isn't a lot of scope from which to find such gain. A pure race engine might make for a better overall package but only at the cost of some horsepower. Given the mandatory air restrictors and the maturity of gasoline engine technology there isn't scope to find a significant increase in horsepower. The use of direct gasoline injection might help overall race pace but even that gain would only be at best marginal.

On the other hand, turbodiesel racing engine technology is far from mature. Steel pistons are replacing aluminium alloy and injection pressure is increasing. These and other factors mean that the ultimate limit of turbodiesel horsepower given the current restrictor area hasn't yet been explored. At the same time, Peugeot has admitted that if it has the budget to produce a brand new engine, from what it has learned so far it is confident that it can save a lot of engine weight for no compromise on performance. In other words, the scope exists to significantly improve the overall car package.

The ACO is well aware of this; well aware that if Honda does turn up with an optimised gasoline car, it might find that the turbodiesels have taken a significant step further forward. Keen to attract a third manufacturer, the ACO is looking to rule changes that keep the turbodiesels in check. In fact, it is looking to slow all of the prototypes. At the pre-race test Marc Gene was hospitalised after he lost control of his Peugeot in the Porsche

Curves. It was a huge crash that underlined the ACO's concern that the cars currently are simply too quick. In fact, even before the 2008 cars had run on the Le Mans circuit the ACO had talked about reducing speed, saying that the 2007 pole time of 206.344 seconds was, in its opinion, on the wrong side of 210 seconds. By that token the 2008 pole time was over ten seconds quicker than the ACO feels comfortable with. If it does move to slow the cars this much, that provides considerable scope to alter the balance between diesel and gasoline.

There will also be moves to address the danger of the cars 'flying' – there have been incidents this season that suggest there is further need to address high speed aerodynamic stability when extreme angles of yaw are encountered, for whatever reason. On top of this, there is another twist and that is the ACO's willingness to accommodate energy recovery systems from 2009. Formula One will have Kinetic Energy Recovery Systems (KERS) in 2009 and it is likely that the same sort of technology will be exploited at Le Mans, albeit under different rules in terms of the amount of energy that can be stored and reapplied. The ACO is also likely to follow the lead of the American Le Mans Series in embracing a higher level of bioethanol – moving from the current E10 to E85 and perhaps pure bioethanol in due course.

All in all, it is clear that the Le Mans Prototypes of the near future will be very different from the current breed and with that we can anticipate much closer battles between turbodiesel and gasoline or even bioethanol powered cars.