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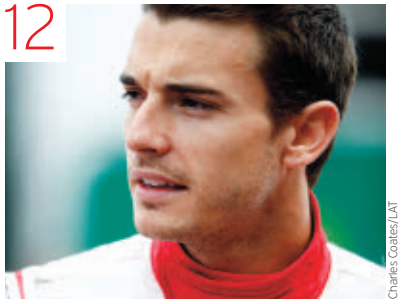

Charles Coates/LAT

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JULES BIANCHI
1989-2015

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National Dragster Archive

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"Every time a rear-engined car got up around 200mph it would crash. Everybody told me not to do it"

"BIG DADDY" DON GARLITS

Peter Harholdt

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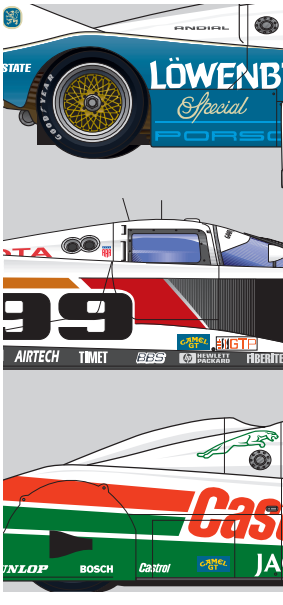
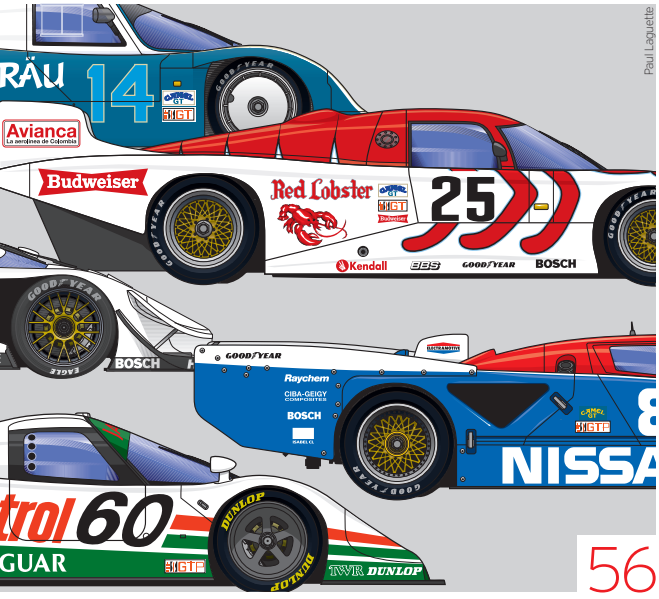


Stirling Moss pushes an F1 great, the Maserati 250F, across the line at Monza in '56. (BELOW) Another great with a great – Jacky Ickx and Porsche 936. (BELOW LEFT) GTP icons.

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FREEZE FRAME

It's early in the 24 Hours of Le Mans, but the intensity as the No. 17 Porsche 919 Hybrid pits won't let up until the finish, when Porsche will celebrate a famous 1-2.

WHERE Circuit de la Sarthe, Le Mans, France
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David Malsher
EDITOR

"While the W196 was crammed with new tech and crushed the opposition, Fangio and Moss preferred the 'simple' Maserati 250F and revelled in its handling"

The KISS ethos – Keep It Simple, Stupid – is one that rarely creates great racecars. Generally, the machines that earned big numbers at the time, and still earn big plaudits decades later, are ones that have incorporated technological breakthroughs or introduced a completely fresh way of attacking a problem. Think Mercedes-Benz W196, Lotus 79, Williams-Renault FW14B, Penske-Mercedes PC23B...

But the Maserati 250F (RIGHT) is one obvious exception. As you'll read in this issue, there was nothing startling under that car's beautiful skin, particularly not when compared with the W196. But while the Benz was crammed with new tech and crushed the opposition, its most famous drivers, Juan Manuel Fangio and Stirling Moss, preferred the "simple" Maser and revelled in its glorious handling.

That kind of greatness is less quantifiable than power outputs and results sheets, but no less real. And anyway, here's a hard stat: the 250F won the first grand prix of 1954, yet was still able to carry Fangio to the 1957 World Championship, and even win a non-points F1 race in '58.

Longevity and relative simplicity is also the mark of two of our other featured cars this month. The Porsche 936 was driven

LAT archive

by heart – Porsche's continuing desire to win Le Mans overall, not merely rack up class victories with 911 derivatives – and it produced a gem that earned three LM24 victories over six years. Similarly, the Eagle 7200-7400 "family" eschewed the pursuit of the big breakthrough to focus instead on getting every crucial aerodynamic and engineering detail right by thoroughly thought-through design. Their superiority turned these Eagles into some of the most popular "customer cars" in Indy car history.

Customer cars are now a hot topic in Formula 1 as ways are sought to cut costs for smaller teams (see page 24). But at the other end of the scale, the end that covers free-thinking excess, don't miss our story on the greatest cars of IMSA's GTP era... ■

editor@racer.com

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Shawn Gritzmacher

Nothing lights a fire under Marshall Pruett like the chance to write about IMSA's GTP and GTO/GTU icons. Picking the best was hard, but the result is entertaining.

STORYBOARD

Murenbeeld/LAT

More even than his achievements as a driver, those '70s Eagles made Dan Gurney into a household name, and earned Bobby Unser the reputation of being America's fastest racer. Robin Miller pays tribute, starting page 38.

12 RACES. 4 CLASSES. 1 CHAMPIONSHIP.

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Phillip Abbott/LAT

The Indy 300 at Iowa in July featured the first American 1-2-3 finish since 2006, when Sam Hornish beat Marco and Michael Andretti at Indy (LEFT). The Iowa result was also the first U.S. 1-2-3-4 since 2001 at Chicagoland.

RAHAL KEEPS HONDA IN THE INDYCAR FIGHT

A simplified aero kit and Graham Rahal's pace and consistency give HPD more than an outside chance...

> There have been times in 2015 when the Verizon IndyCar Series has been distinctly Chevrolet dominated, while the Honda-powered teams have struggled a little with torque and a lot with the complexities of the Wirth Research-designed aero kit.

Yet in the second half of the season, there has been a resurgence from Honda Performance Development. Not only did Andretti Autosport's Ryan Hunter-Reay appear able to match anything that was thrown at him on his way to victory at Iowa Speedway, but another Honda driver, Rahal Letterman Lanigan Racing's Graham Rahal, surged into second place in the driver standings with just three of the 16 rounds still to go.

While it would be easy to say the foundation of his challenge was victory in the Fontana crapshoot (see page 14), it has actually been his consistently strong form all season that's causing his critics to eat crow. The single-car RLLR squad also foils those who wish to lay the blame for Andretti Autosport's underwhelming 2015 season entirely at HPD's door.

Following a stirring drive to fourth place at Iowa, where he came from two laps down after picking up a puncture and having his gearbox stuck in sixth, Rahal was bullish about his championship chances.

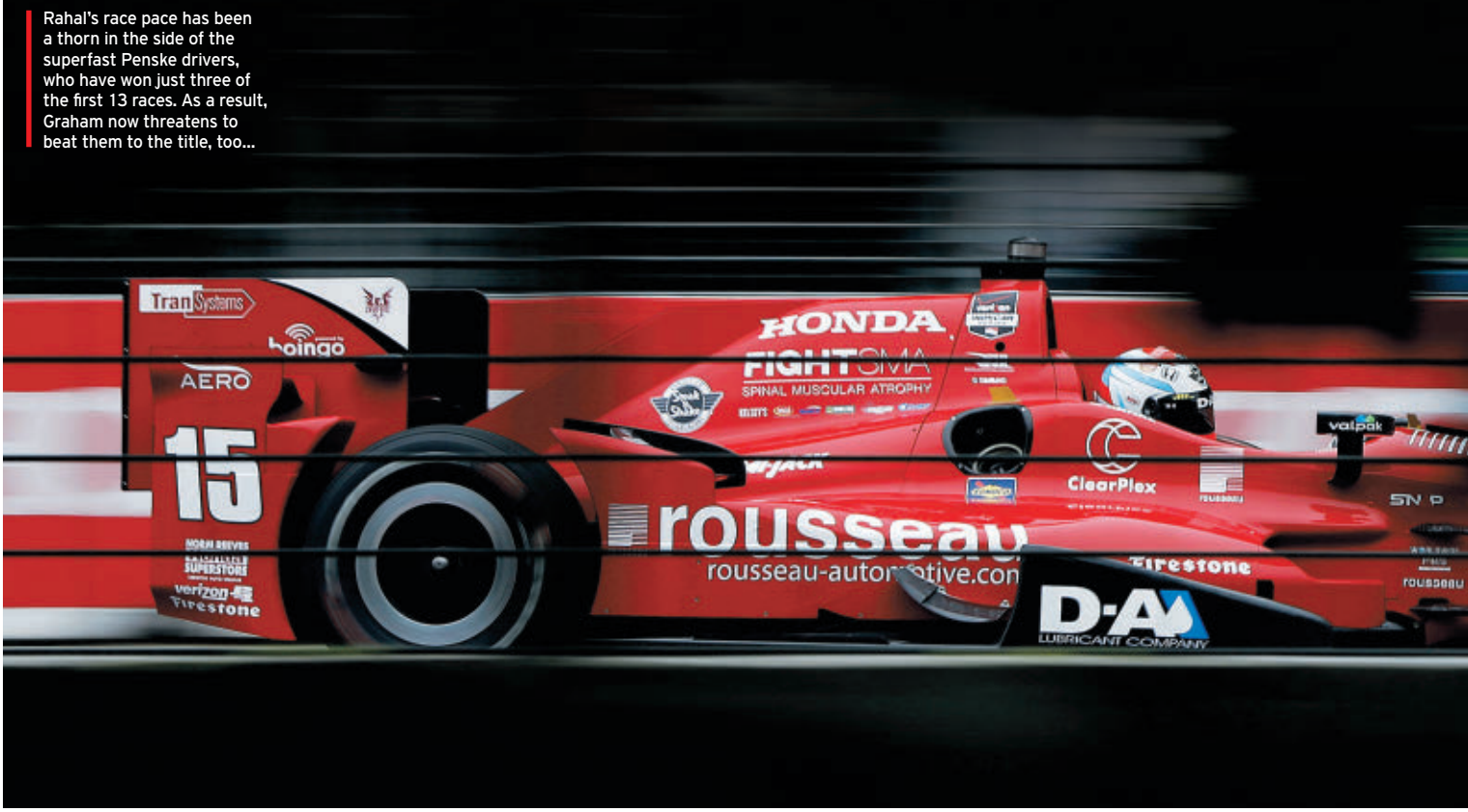
"Nights like that build character and build champions," he said. "It speaks volumes for this team that we are second in the points. We can win Honda a championship. We've got three more races to go and we're going to two tracks I think we can be really strong at."


Gavin Baker/LAT

WHEN CHEVYS RULED

At Long Beach in April, Ganassi and Penske looked in a different league from their competitors, and Chevrolet had an embarrassing margin over Honda. Things seem a little more even now...

Rahal's race pace has been a thorn in the side of the superfast Penske drivers, who have won just three of the first 13 races. As a result, Graham now threatens to beat them to the title, too...

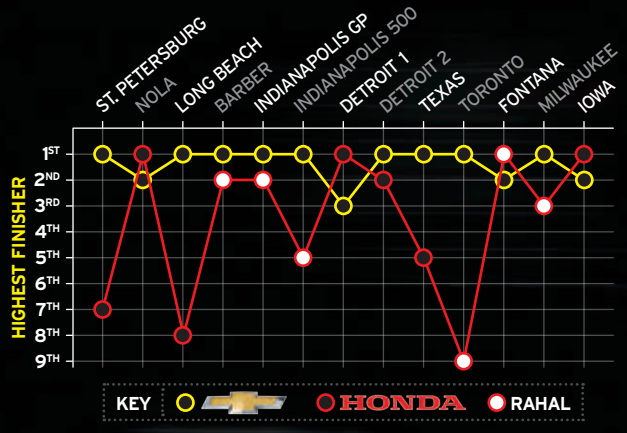


iStock/DenisTangneyJr

With Boston set to host the 2016 IndyCar finale on Sept. 4, there have been concerns that IndyCar will again feature a short and compressed schedule. Mark Miles, however, says he aims to start the season in February.

2015: CHEVY VS. RAHAL...

While Chevrolet never finished off the podium in the first 13 races, Honda's race form was like a yo-yo. Among its runners, Graham Rahal's consistency has been noteworthy – six times he's been top Honda finisher.



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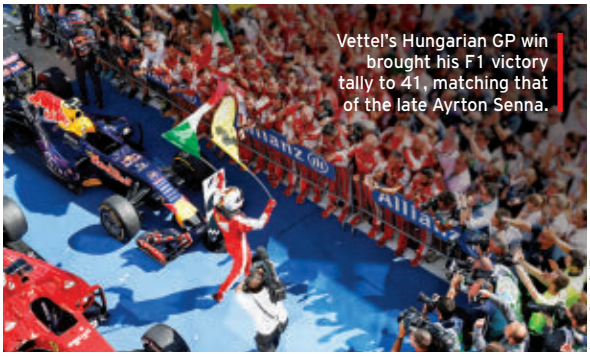


Vettel's Hungarian GP win brought his F1 victory tally to 41, matching that of the late Ayrton Senna.

Alastair Staley/LAT

HUNGARY HORSE FEEDS ON SCRAPS

Vettel's second win brings Ferrari mid-term joy

> Four-time world champion Sebastian Vettel brought hope to the Ferrari faithful with a stylish win at the Hungaroring, sending the Scuderia into the mid-season break with a renewed sense of hope.

Yet there remained ultimately inconclusive discussions as to whether Ferrari had taken a genuine leap forward, or whether the Hungarian GP result had been against the run of play, and that the hitherto dominant Mercedes team had simply shot itself in the foot. Both drivers made poor starts, as they had also at Silverstone. But whereas in Britain Lewis Hamilton and Nico Rosberg eventually scored a 1-2 finish, in Hungary they made errors and had collisions that left them sixth and eighth.

Still, polesitter Hamilton was 0.7sec faster than Vettel in Hungary's qualifying session, so while Ferrari's SF-15T is fast enough to pounce when Mercedes falter, the W06 clearly remains vastly superior.

Dan and Dan remind each other what champagne tastes like.

Lars Baron/Getty Images

A RARE TREAT FOR RED BULL

> Last season, Red Bull Racing and Daniel Ricciardo snuck three F1 wins despite Mercedes-Benz dominance. But with Renault struggling for reliability and power, 2015 has been grim: it took until Round 10 for RBR to grab even a top-three finish.

But when it did, it saw both Ricciardo (third) and Daniil Kvyat (second) step onto the Hungarian podium. Kvyat kept it clean and earned his best F1 finish, while the race's defending winner scrapped hard, survived collisions with both Mercedes and dedicated his performance to his late friend, Jules Bianchi.


Chris Owens

When Max Chilton claimed his first Indy Lights victory at Iowa Speedway the day after Jules Bianchi's death, he said of his former F1 teammate: "I'm dedicating this to Jules. He'd have driven the perfect race, as always."


Andrew Ferraro/LAT

Bianchi's points-scoring drive at Monaco in 2014 was hailed as "a miracle" by Fernando Alonso.

JULES BIANCHI, 1989-2015


Charneaux/XPB Images/LAT

SADDLED FOR STARDOM

Stolen potential added to the sense of tragedy at Bianchi's passing. Ferrari had already chosen him to replace Kimi Raikkonen whenever it parted with the Finn, according to its ex-chairman Luca di Montezemolo.

> Jules Bianchi's father admitted earlier this year that the family had accepted their son would never recover from the terrible head injuries he suffered when he hit a recovery tractor at the Japanese Grand Prix last October. Yet it still came as a profound shock on July 17 when the Frenchman became the first Formula 1 driver since Ayrton Senna in 1994 to die from injuries suffered in a crash.

The 25-year-old's passing made a particular impression on younger F1 racers, who had grown up in an era of comparative safety. Red Bull Racing's Daniel Ricciardo admitted that he'd been impatient with older drivers' safety pushes earlier in his career, but was now more measured.


Glenn Dunbar/LAT

Bianchi's passing was felt throughout the racing world. The FIA took the unusual step of retiring No. 17 from F1 in his honor.

"The older drivers would pick out things around the track, like the angle of a barrier being bad if we punctured a tire and went off there, and as a younger driver you think, 'That would never happen, let's just get on with it and race,'" said Ricciardo. "At least now we know there's never going to be that situation again – they're never going to let the race go on like that in those conditions with a tractor on the track."

Although it is believed that a closed cockpit would not have saved Bianchi from the injuries he sustained at Suzuka, his death appeared to prompt a new look at such radical ideas.

"I saw some pictures [of a closed-cockpit design] which I think looked pretty cool, I have to say," said reigning World Champion Lewis Hamilton. "I'd imagine that at some stage it may be a change Formula 1 would do."


Red Bull

KICKING UP DUST AT THE AUTODROMO

> Preparations continue for the return of Formula 1 to Mexico City and its Autodromo Hermanos Rodriguez this November after a 23-year absence. The circuit remains under construction, but Red Bull Racing's Daniel Ricciardo and Toro Rosso's Carlos Sainz Jr. got an advance look at the revised track in July, taking turns behind the wheel of a Red Bull RB7.

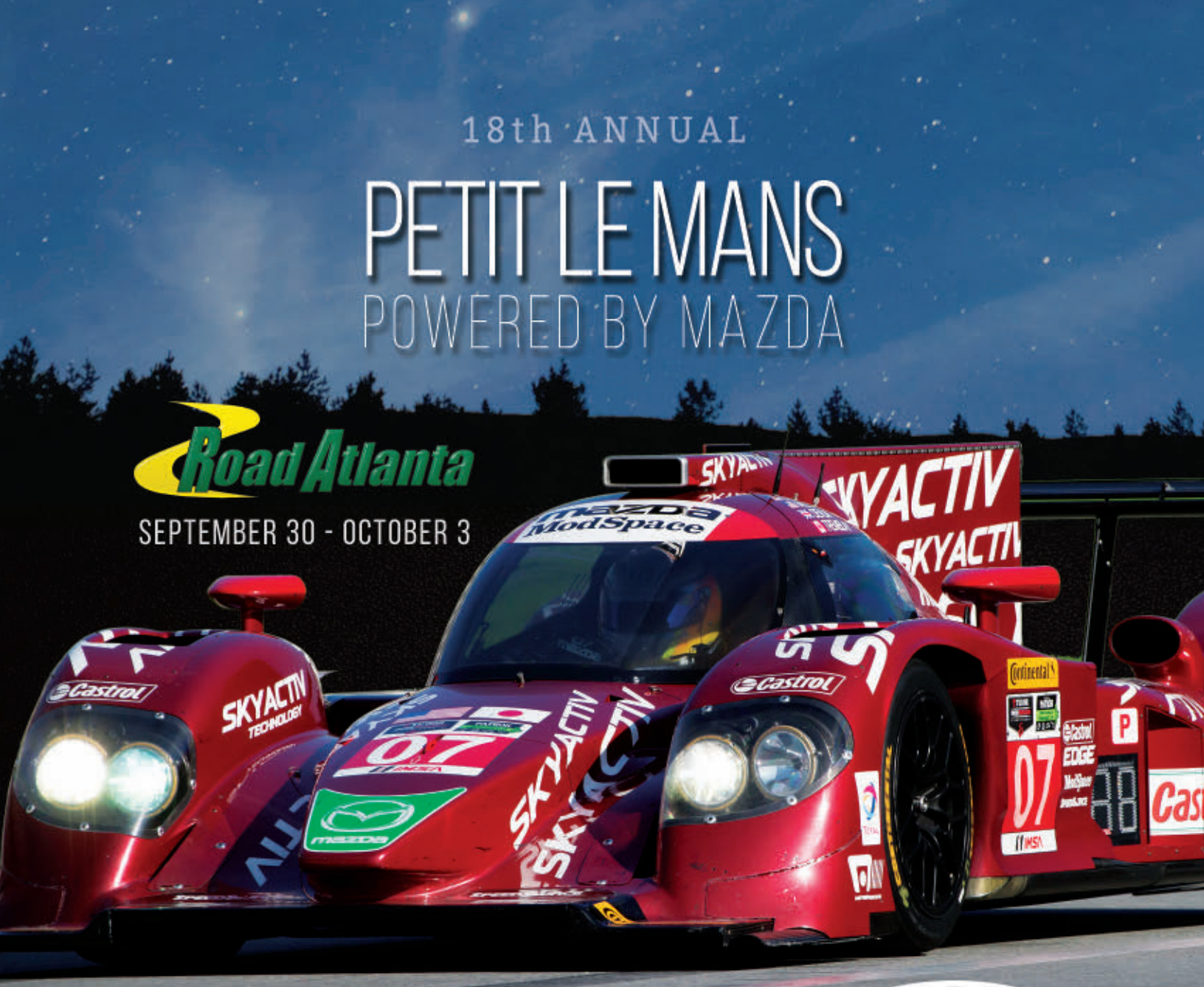
"It clearly has a good mix of fast and slow corners, which I think will be a real challenge," said Ricciardo.

Red Bull then helped rev up support for the race by turning Ricciardo and Sainz loose in twin RB7s around a specially constructed course hugging the perimeter of Mexico City's central plaza, in front of more than 150,000 people.

"That's what these show runs are all about: getting the fans close to the cars, getting them excited about F1," said Ricciardo. "I think Mexicans are sports fanatics in general, and they've really embraced Formula 1 again."


Al Staley/LAT

Sergio Perez is set to become the first Mexican to race in his home GP since Pedro Rodriguez in 1970.



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A serious crash in February at Daytona put Kyle Busch down for the count. Yet winning four out of five recent NASCAR Sprint Cup races on widely varying tracks (LEFT, Sonoma) has made it likely he won't even need a waiver to qualify for the Chase.


Nigel Kinrade/LAT

DODGING DISASTER

Relief and concern after another fence-testing Big One at Daytona

> Relief followed horror after the launch of Austin Dillon's Richard Childress Racing Chevrolet SS into the catch fencing in a multi-car pile-up at the end of Daytona's July NASCAR Sprint Cup race. Dillon's car landed upside down on the track with severe damage to both ends, including a torn-out engine, and was then struck again. Yet Dillon escaped with bruising, while five fans suffered only minor injuries.

"I'm shocked that Austin Dillon is even alive," admitted Jimmie Johnson. "The fence and the cables, it's like a great cheesegrater to a racecar...and unfortunately all the energy as the car comes apart is carrying the debris out into the grandstands."

The Daytona fence's cheesegrater effect diced up Dillon's car and peppered the grandstands with debris, but the fans, driver and the sport all dodged the bullet.

NASCAR executive vp Steve O'Donnell noted that the fence had performed as expected, but pledged the sanctioning body would investigate how it might be improved.

"The catch fence, first and foremost, is there to keep the car from going through, and it did that," he said. "This is an area for all sports to look at, with anything either flying away from a playing field or a racing surface. If we can lead in that area, we want to do just that."


John Harrelson/LAT

RUBBER SIDE UP

Race crews leapt to Dillon's aid, earning a mild rebuke from NASCAR, but happily medical assistance wasn't needed.


Leland Hill/LAT

Briscoe's wild ride didn't change his opinion of racing at Fontana.

FLIPPING OUT AND POINTING FINGERS

> IndyCar had a panic-button moment of its own at the end of a Fontana race that sparked a diversity of opinion over whether high-downforce speedway oval racing constituted must-see TV or an unconscionably dangerous thrill ride.

Despite his heavy crash at the end of the race, Ryan Briscoe was among the earnest supporters of the racing at Auto Club Speedway, against harsh criticism from reigning champ Will Power and series veterans Tony Kanaan and Scott Dixon.


Michael Levitt/LAT

Remarkably swift recovery from Indy injuries made James Hinchcliffe a welcome presence at the races.

But while the drivers' views were split, it seemed to play well with the public. Despite poor at-track attendance – a daytime start in the middle of Southern California's broiling summer was hardly conducive to sitting in the stands – the race began a ratings boomlet for the Verizon IndyCar Series that produced three straight events with more than a half-million viewers, a first for the series on NBCSN.


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FIA

New rules shake up the World Rally Championship for 2017. Power will be boosted and weight reduced, while wings will be less restricted and the cars will be longer and wider for a more aggressive look.


Millen and his PP03 zapped the competition at Pikes Peak, but the winner wanted more.

Rupert Berrington

BATTERY CHARGERS

Rhys Millen takes all-electric tech to victory at Pikes Peak

> America's second-oldest motorsports event – the Pikes Peak International Hill Climb – was won by an electric-powered vehicle for the first time. Despite losing its rear motor pack halfway through the run, Rhys Millen set a new record time for battery-powered cars of 9m07.222s to take the overall victory with his eO PP03. That was nearly a minute off the all-time PPIHC record set by Sebastien Loeb in 2013, but if he'd had full power all the way, Millen would have been a lot closer.

"It was 30 seconds off the time we estimated based on our practice times," said Millen. "It's a record, but it's frustrating. I guess it's one more year we have to wait."

Still, it marked a significant milestone for electric technology. Built by Drive eO, a Latvian company specializing in the design and manufacture of electric and hybrid-electric prototype vehicles, the eO PP03 produces 1,367hp peak power and 1,593lb.ft of torque from a 50 kWh lithium-ion battery pack and six YASA-400 electric motors.

> "IT WAS 30 SECONDS OFF THE TIME WE ESTIMATED. IT'S A RECORD, BUT IT'S FRUSTRATING..." **RHYS MILLEN**

The jolts kept coming, as another electric-powered vehicle – the e-Runner driven by Pikes Peak veteran Nobuhiro "Monster" Tajima – finished second overall with a time of 9m32.401s.

Millen's win was another link in a chain of success for the family at the storied hill climb. His father Rod won at Pikes Peak five times overall – and was reunited with his famous Unlimited Toyota Tacoma for a run up the hill at the Goodwood Festival of Speed on the same weekend that Rhys was proving another point for alternative-powered vehicles in motorsports.


Rupert Berrington

Jeff Zwart added to his Pikes Peak legend by claiming an eighth class win. Zwart's Time Attack 1 class Porsche 911 GT3 Turbo Cup had the fourth-best overall time of 9m46.243s.

Rupert Berrington

MORE MILLEN MOMENTUM

Rhys Millen's brother Ryan (ABOVE) won the Electric Production class in a Toyota RAV4 EV running as an homage to dad Rod's mighty Tacoma. Find out more about Ryan on page 82.


Steven Tee/LAT

FORMULA E AMPS UP FOR SEASON TWO

> The inaugural 2014-'15 season for the FIA Formula E championship demonstrated both the potential and the limitations imposed on the series pushing electric technology to the maximum. Yet teams are already ramping up for season two, which will include some significant new developments.

In the first campaign, power was restricted to 150kW in race mode, compared to the full amount of 200kW available in practice and qualifying. The race power level could be increased to 170kW for the 2015-'16 season, which begins in Beijing on Oct. 17.

Additionally, powertrain development is opened up for the second season, with eight manufacturers having been approved to produce their own units, including Andretti Autosport.

A new race in Paris joins Long Beach on the 11-round 2015-'16 calendar, as Formula E continues to evolve from curiousity to competition.


Steven Tee/LAT

PIQUET'S POWERPLAY

China Racing's Nelson Piquet Jr. capped a consistent season to claim the first Formula E driver's title. The F1 racer turned Global Rallycrosser bested Sebastien Buemi by a single point.


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"REMEMBER THAT FEELING"

A RACING JOURNEY
PATRICK DEMPSEY


F. Pearce Williams/LAT

LM GTE-AM PODIUM FINISHER, 2015 24 HOURS OF LE MANS

Looking back, the debrief at Silverstone's FIA World Endurance Championship season-opener set the tone for the ultimate result at Le Mans this year, second in GTE Am.

Silverstone was very challenging on multiple levels. Besides arriving late, it was also my first time in the new car. Patrick Long and Marco Seefried had done the WEC preseason test at Paul Ricard, but I couldn't attend due to my final commitments to *Grey's Anatomy*. In addition to the tremendous amount of sponsor obligations, we all had to get used to working together. Marco was a new co-driver and Jacques Hendrikse our new engineer.

I'd never been to Silverstone, so learning a very fast track that is devoid of obvious reference points was very challenging. We were off the pace overall and certainly I was the furthest off. The question was, how do we close the deficit? Patrick hadn't been there in a long time and the track configuration had changed since then. Our third driver, Marco, and I were learning each other's backgrounds and also learning to communicate. His background as a mechanic and his ability to communicate with Proton mechanics was measurable and impressive.

The first thing that struck me on arriving at Silverstone was the seriousness of the Porsche Team. There'd been a great deal of stress and major challenges just getting to the UK, and I knew the stakes were high and there was huge pressure on everybody to make this program succeed. When I was summoned to the Porsche Motorsports hauler I knew it was

serious, but when I looked at Patrick Long, I realized just how serious it was. His eyes lacked their usual little twinkle, so I knew at that point this meeting was all business.

Jacques is the perfect race engineer. He's zero bullshit; a guy you want to go into battle with. If he can't lead you, he's going to push you where he wants to go. He's committed, focused, even obsessed by winning. But he's also supportive. Once you get past his gruff nature, he can be understanding and funny. The third person was Dr. Frank-Steffen Walliser, head of GT Motorsports at Porsche.

Down to the business at hand: What did I need as a driver to improve my times?

A simple question, and a simple answer – I needed more seat time and testing.

Patrick was in control of overseeing my development as a driver and I couldn't be in better hands. He had a plan in place and calmly explained it to the team. Two weeks prior to Silverstone, he took me to a rally school outside Seattle and we spent the entire day pounding around in the dirt. He felt that learning car control in a rear-wheel-drive rally car would help my road racing. We had a blast and made great progress.

In Seattle we also discovered a simple video game-based simulator that didn't make me ill – something I've suffered from in the past. The 2015 WEC schedule includes six tracks I'd never been to before. Just learning the rhythm of the track on a simulator would help me the first time I saw a new track in person. We developed a testing program that would help us get more seat time and also learn the tracks. First up was Bahrain.

> "At this moment, I realized I was now a race driver. No longer an actor racing when I could, but a *race driver*"

The plan was to test in Bahrain, then do some marketing and PR for Porsche in Dubai. Lee Newton, who I met many years ago in Atlanta, set up the promotional event for the Porsche Panamera in Dubai.

The Bahrain track is notorious for being brutal on tires. You get two good laps and then the tires fall off. When I rolled out for my first session in the car, on another new track, knowing I only had two laps to set a decent time, that turned up the pressure to perform. Add some heat, dust, and the pressure to match my teammates' times and it would be an intense experience.

After Patrick and Marco went out and set a baseline, I did my first run to get to know the track, and I knew I had time to make up. We looked at the data, and we set a lap time goal for me. It was called a goal, but in reality it was a time I had to achieve. It was at this moment that I realized I was now a race driver. No longer an actor racing when I could, but a *race driver*. The future of the program depended upon me hitting this lap time.

This experience gave me a much better perspective on what top drivers do on a daily basis. The pressures they're under; the pain they undergo. It was humbling, but I was still pleased to be there! Would I be able to achieve the lap time required? I focused on the mental aspect of racing, using visualization to increase my confidence. I knew what I had to do.

I finished my six-lap run, pulled into the box, and got out of the car. I knew from the dash display that I'd achieved the target time. Jacques nodded, Marco smiled, and Patrick pulled me aside to a private location in the garage. He spoke quietly and said, "Remember that – that's what you need to do every time you get in the car. Remember that feeling. Remember what you just did."

My first test completed, and the sense of satisfaction was immense. You can only imagine what it means to be accepted by these guys. We did more long runs in the afternoon. The heat was brutal, but important to my conditioning. At the end of the day, I'd made no mistakes. No spins, no offs. I proved that I could be fast enough. We headed off to Dubai for the Porsche event and then Belgium to race at Spa. ■

WEC races are won or lost by the performance of all three drivers in a car. For Patrick Dempsey, the realization that he could match the on-track expectations placed on him by his teammates was a breakthrough moment.

Camden Thrasher

Gregg Ellman/LAT

HIGH-SPEED CONNECTION

When the stars of the show are traveling at more than 200mph, things can happen in a heartbeat. So to produce the Verizon INDYCAR 15 app, timing is everything.

If you're a Verizon customer and a racing fan, you've probably enjoyed the many features of the Verizon INDYCAR 15 app. With its choice of in-car camera views, unique video angles and 10 radio channels, plus leaderboards and racecar telematics, never before have Verizon IndyCar Series fans had a chance to experience a race from so many vantage points.

Collecting and transmitting all that data through a single app using a cellular or Wi-Fi signal is no small feat. Verizon has dedicated a team of 20-25 people to concentrate exclusively on maintaining and operating the app during IndyCar races, including on- and off-site technology specialists, developers and engineers.

Verizon works hand-in-hand with IMS Productions, producer of the television broadcasts for both ABC and NBC Sports, plus Racing Electronics for the radio communications, and the IndyCar timing and scoring department.

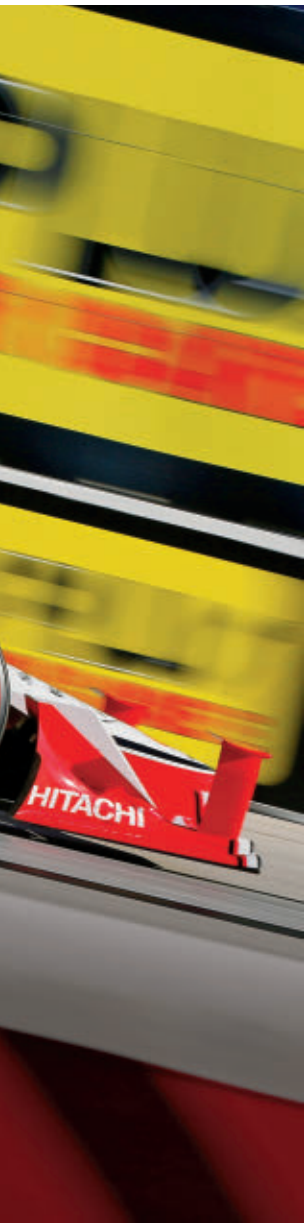
Perry Nelson/LAT

(LEFT) With the running order changing frequently in a typical Verizon IndyCar Series race, having access to an up-to-date leaderboard can greatly enhance the race experience for fans at the track and watching on TV.

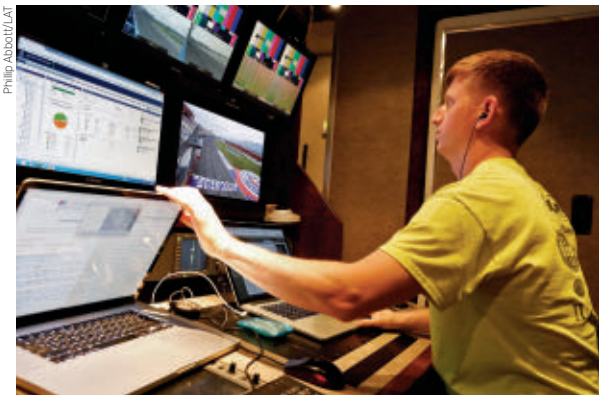
"There are many moving parts to creating such a great app," says James McVey, associate director of marketing technology at Verizon. "All the teams work together with one goal in mind, to give Verizon customers and race fans everywhere the best possible experience both on and off the track."

While we fans sit in the grandstands or in front of our televisions enjoying the action, it would be a mistake to think that the backend production elements were as seamless to integrate as they appear on the front end.

Indeed, the Verizon INDYCAR 15 app team first had to wrestle with an array of disparate technology standards that had each been designed to perform their own task to perfection, but not necessarily to play well with others. In other words, broadcast television technology is great at broadcasting television, not at communicating with a mobile app.



Phillip Abbott/LAT



Sam Cobb/LAT

Phillip Abbott/LAT

(MAIN) When your favorite Verizon IndyCar Series driver flashes across the start/finish line, the Verizon INDYCAR 15 app provides a seamless take on their position, lap time and speed. (LEFT, top to bottom) Verizon's at-track app team ensures the data stream is in sync; viewing app data at the track takes on a different perspective to watching events at home on TV; it looks complicated, and it is – but Verizon and its partners are expert at making it all work.

"Those watching the event live have a different perspective to those watching the TV broadcast"

JAMES McVEY

In putting the different elements together, a fundamental hurdle to overcome is the fact that each one marches to the beat of its own drummer. While the differences among them may be small, it's enough to throw the entire system into chaos. Imagine a racecar crossing the start/finish line. Timing and scoring records it within a split-second, but its image in the leaderboard might appear a minute later, and the telematics that should reflect the car at 175mph might instead read 155mph because it's a further second in arrears. To avoid that happening, perfect synchronicity is essential.

To convey the information seamlessly, the app team developed a time code system with the ability to compensate for the different latencies in the individual components. As a result, when a racecar crosses the start/finish line, you'll see it on the leaderboard, register it on timing and scoring, and follow it on the telemetry, all in perfect sync.

"The timing challenge is further compounded by the fact that those watching the event live have a different perspective to those watching the television broadcast," McVey explains. >

CHOOSING THE INFO

INDYCAR'S RICH SEAM OF DATA

According to Jon Koskey, IndyCar's director of timing and innovation, the wealth and diversity of data that the series can provide to Verizon is so rich that one crucial element in planning the Verizon INDYCAR 15 app was sitting down with Verizon's app team to determine which elements of that data could most meaningfully be used in the app for the benefit of race fans.

Once the group agreed, IndyCar's own team wrote the software that converted the data stream into something the app can make use of. The single data source, provided through an "ERP solution" similar to what a large company may use to monitor its inventory across a large network, freed the Verizon team to focus on the elements of app design and implementation where they are the most skilled.

Phillip Abbott/LAT

An IndyCar race event produces masses of data, some of which will be used in the INDYCAR 1.5 app.

For more on the features (exclusive and basic) available on the INDYCAR 15 app and to view compatible devices, go to **verizonwireless.com/indycar**

Scott R LePage/LAT

Phillip Abbott/LAT

Ernie Mastche/LAT

(ABOVE) Verizon's app team constantly monitors every car. (FAR LEFT) The team works closely with the TV production crew. (LEFT) It's all part of Verizon being way more than just a sponsor.

"There are no time outs or half times in IndyCar racing, so we have to be prepared well before it begins"

JAMES McVEY

"The fan at the track is witnessing it all in real time, so if they happen to be following their favorite driver from the INDYCAR 15 leaderboard, it's essential that as the car enters their particular vantage point, the leaderboard corresponds to that same position. By contrast, the home viewer may require that the images on their television screen are in sync with the other data displayed in the app, but the gap here is the furthest to bridge, since the broadcast has the longest latency."

The various crews arrive at a venue at least three days before the first on-track activity in order to lay fiber cable and receivers around the track to pick up data and video from the racecars. Then, working from its own command center within the TV compound, the Verizon INDYCAR 15 app team is linked via a phone bridge to Verizon's app team across different parts of the country.

Once the action on track goes live, a complex dance ensues where the at-track app team must, via multiple encoders, choreograph the signals coming from timing and scoring, TV and driver communications to the beat of the VIDEO CODEC for the time sync, before it's beamed via the internet to Verizon's app team, where in turn it's fed into the app.

"On top of all that, we need to monitor 24-33 cars competing individually at 200mph-plus," adds McVey. "There are no time outs, quarters or half times in IndyCar racing, so we have to be prepared well before the race weekend begins. And although the app only streams video from two cars, we actually have several cars set up as backup in case something happens to the two primary cars."

So the next time you pick up your phone or tablet to use the Verizon INDYCAR 15 app, your simple tap of the finger on the screen is the last step in a long and innovative process to bring you the best possible Verizon IndyCar Series viewing experience available. ■

VERIZON INDYCAR SERIES

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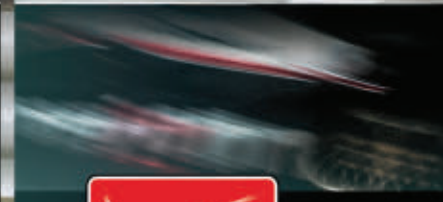

verizon INDYCAR SERIES

WORDS Adam Cooper
MAIN IMAGE Glenn Dunbar/LAT

CUSTOMER **SERVICE**

At face value, customer cars could be a get-out-of-jail card for struggling Formula 1 teams. But is there more to it? Are they a way to give the big teams even more power?

The idea of customer cars has been floating around in Formula 1 circles for years, but after a possibly pivotal meeting of the F1 Strategy Group last May, it's firmly back on the agenda – and the divisive concept, which many say goes against the very DNA of grand prix racing, is now at the center of a power struggle that could engulf the sport.

Customer cars are on the radar ostensibly because of concerns about the future size of the F1 grid. In the past few years we've lost HRT and Caterham, while next year we gain Haas, which would bring the field back up to a relatively healthy 22 cars. However, Sauber, Lotus, Force India and Manor all face a tight financial squeeze and an uncertain long-term future given that F1 costs continue to rise – and the bulk of F1's income goes to a core of big teams (Ferrari, Mercedes, Red Bull and McLaren, with Williams also getting preferential treatment, thanks to its longevity and past success), regardless of their annual performance.

In recent decades, F1 has been based around the concept of teams also being constructors, but there is a history of customer cars in the sport. It's worth recalling that Frank Williams made his first forays as an F1 team owner running a second-hand Brabham in 1969, and when he was forced to start again from scratch in 1977, he initially acquired a March. By coincidence the sport's last pure customer cars were the Williams FW07s entered by John Macdonald's RAM organization in 1980 (see page 26), after which rule

Steven Tee/LAT

AS "CUSTOMER" AS ALLOWED...
Under team principal Guenther Steiner, Haas F1 will be the nearest thing to a customer team allowed under the current rules.


Steve Etherington/LAT

PLANS ARE AFOOT...

(BELOW) To the chagrin of the smaller teams, F1's "Big Four" - McLaren, Ferrari, Mercedes and Red Bull – held a closed-door meeting at the Canadian Grand Prix to discuss "franchise" cars. (LEFT) Bernie Ecclestone's take on customer cars is based on a spec chassis and engine - a philosophy at odds with the sport's current engine suppliers.


Adrian Sibley/LAT

(MAIN) Formula 1's 10 current teams must design and build their own chassis and aero components. But as several of them scramble for budgets, are customer – or "franchise" – cars a looming inevitability?

changes and commercial arrangements made such a project impossible.

Over the years, the subject's come up from time to time, usually sparked by downturns in the global economy and the subsequent loss of teams. And usually in tandem with talk of an alternative plan – third entries from the big teams.

Farming a pair of cars out to another team has obvious appeal for the big players. It's a potentially lucrative revenue stream, and can provide seats for young drivers being groomed for the main team. The Red Bull/Toro Rosso model does a similar job, but while they do share some resources, the two outfits have latterly diverged, and the cars are developed independently.

The Haas F1 model is different again. The rules now allow teams to share everything except chassis and aerodynamics, so the U.S. outfit will buy everything it legally can from Ferrari. It's as close as one can currently get to a pure customer car. However, the big teams are now pushing for the rules to be further relaxed, so that they can provide a complete turn-key package.

"I think we need to have a contingency plan in place to say what happens if a team or two drops out"

TOTO WOLFF

Just to confuse the issue, a very different take on the customer car concept is also out there, one preferred by F1's commercial supremo Bernie Ecclestone. Rather than allowing the big teams to supply extra cars, he wants to create a spec, low-budget chassis/engine package that smaller teams could buy and then operate – something like a Dallara-Cosworth. The engine would not be a full-on hybrid, but a simpler and cheaper turbo V6, albeit with a KERS element. How Bernie would ensure that the two distinct packages could race together remains to be seen.

"We hope that everything stays like it is, and they [the struggling teams] can make it commercially viable for themselves," Mercedes F1 boss Toto Wolff told *RACER*. "But you need to be responsible enough for F1 to say, 'What happens if...'?

"I think we need to have a contingency plan in place to say what happens if a team or two drops out. What do we do? I >

Sam Bloxham/LAT

(MAIN) Mercedes-powered Force India is one of the midfield teams that can occassionally mix it with the teams at the sharp end. Owner Vijay Mallya is adamant that "franchise" cars wouldn't enhance its competitiveness.

A BRIEF HISTORY OF FORMULA 1 CUSTOMER CARS

For the first three decades of the Formula 1 World Championship, customer entries were an essential part of the sport.

The Maserati 250F (see page 28) boosted grid sizes in the 1950s, and cars such as the

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ROB WALKER RACING, 1961

Lotus 16 were winning propositions with the right team and driver (ABOVE Stirling Moss on his way to victory in the 1961 Monaco GP).

March took up the customer torch in the early 1970s, and even built an occasional winner, but customer cars

LAT archive

RAM RACING, 1980

were very much on the decline when John McDonald's RAM Racing team bought and raced Williams FW07s in 1980, with little success. RAM ran March's ill-advised F1 return in 1981 and '82 (BELOW), but became a constructor in '83, closing F1's customer era.

LAT archive

RAM MARCH, 1981-'82

think we don't want to be in front of the snake saying, 'Oh my God, now we are down to 18 cars or 16 cars.'"

The most expedient answer is customer cars, or what the bigger teams now term "franchise" cars. But exactly how it would work remains open to debate. A meeting of the four big players in Montreal was one step towards those answers.

"We need to talk solutions," says Wolff. "Like, how is it viable in terms of the sporting and technical regs? Who's going to pay for it, or who's going to finance it? Who's going to supply cars? Which teams get which cars? Do we want to have standard suppliers entering [e.g., a Dallara], or do we do it ourselves? Can last year's cars enter or not? Down to the detail, like who's going to stand on the podium?"

In theory, struggling existing outfits will get first refusal on taking on "franchise" status. In other words, Force India could end up fielding a pair of Mercedes chassis, or Manor might run McLaren-Hondas. But that scenario involves slightly skewed logic, given that the big teams also say the franchise plan will only be triggered if those existing teams have already failed and been lost to the grid.

The suspicion is that the big teams really want to partner up with new

LAT archive

THE THIRD MAN

The last time a team ran three cars in a grand prix was Germany '85, when Renault added Francois Hesnault to run F1's first onboard camera. He retired after eight laps.

entrants, for example, graduates from the ranks of GP2 or elsewhere. Under that scenario, the supplier team would clearly have full control over the fledgling associate that it has helped to move up.

While no one is admitting it in public, a key part of the plan is that franchise teams would hand over their FOM prize money income by way of payment for the cars and parts provided. They would be left to pay running costs through sponsorship, although those costs would be significantly lower because, in theory, they wouldn't need design or manufacturing staff and facilities.

The franchise deals would be a significant revenue stream for the big teams, who would at the same time inevitably control any voting rights. Such a situation would create an unprecedented concentration of power among the four or five top teams.

It's not just a theory – it's what the likes of Force India and Sauber suspect to be the end game. To coin a racing phrase, they believe that they are being hung out to dry.

"There is a move from the manufacturer teams to drive out the independent teams," Force India deputy team principal Bob Fernley told *RACER*. "In the last 18 months some very logical and well thought-out cost-control systems were suggested and rejected; a request for a more equitable distribution of income was put forward and rejected; we tried to get power unit costs down, again rejected.

"I think the customer car, or the franchise car, is the final part of the jigsaw puzzle of replacing independent teams, and it's a very clear program from the four manufacturers to be able to get the power control of F1, and the financial control of F1. I think that's the long term objective."

"What should scare everybody is this concentration of power together with the commercial interests behind it," says Sauber boss Monisha Kaltenborn. "I


Steven Tee/LAT


Sam Bloxham/LAT

SAUBER RESETS FOR REALITY

Sauber's Monisha Kaltenborn presides over an all-new 2015 driver lineup. Simple fact is that Felipe Nasr (LEFT) and Marcus Ericsson both brought significant and necessary backing.


Alastair Staley/LAT

SPOTTING THE TRENDS

Force India deputy team principal Bob Fernley believes that the adoption of customer cars is the last step in an ongoing plan for F1's manufacturers to gain control of the sport's finances.

remember years ago Ross Brawn said this kind of customer car program will cost you at least $50m, and that isn't small money.

"If a customer team's income from the commercial rights holder is an element that the supplier would get instead, that tells you it's all about concentration of power and commercial interests. It's all about money at the end of the day, but not from our side."

Leaving aside the commercial and political aspects, there are other issues. Do fans want to see a version of F1 with four McLarens, four Mercedes, four Ferraris and four Red Bulls, rather than the variety we have now? Yes, you can argue that a midfield team armed with a couple of Ferraris has a more plausible chance of mixing it at the sharp end than with its own cars. But isn't the possibility of an underdog having its day in the sun, thanks to its own skill and application, one of F1's enduring storylines? And how competitive could customer cars be anyway?

"I've never supported the concept of customer cars," says Force India owner Vijay Mallya. "But if the big four who control the majority of the Strategy Group are going to virtually drive out the small independent teams, and then fill the grid with customer cars it remains to be seen how attractive it will be to the audience.

"In 2017, there are new rules, so a customer car would need to be a current car, and I can't see how that would work"

MATTHEW CARTER, LOTUS

"What will the costs turn out to be and, more importantly, how can a customer car be as competitive as a constructor's car? What about the time lag in delivering upgrades? There are so many pending issues that people don't seem to examine in detail. There's just one sweeping statement, 'customer cars,' with a view to answering the inevitable question, which is: If the small teams disappear, how do you fill the grid?"

"When I sat on the Strategy Group last year, talk of customer cars meant you'd buy a year-old Red Bull," adds Lotus CEO Matthew Carter. "But it would never work, because the rules change, so next year you couldn't run this year's car. In 2017 there's a whole new raft of rules, so a customer car would need to be a current car, and I can't see how that would work. We wouldn't do it, we would maintain what we're doing."

Only time will tell how it all unfolds, but the franchise car scenario won't go away as long as F1 has its "haves" and "have nots." ■

RAMPING UP THE SPECTACLE

AN INTENT TO BE FASTER

The same May 14th meeting of the F1 Strategy Group that put customer cars firmly back on the agenda also provided a loose framework for the direction the sport should take in 2017 and beyond – although there is still much to be decided in terms of how the goals should be achieved.

Those in the meeting seemingly put their usual interests aside for a while, and agreed that there is a need for change. The key aims are to make F1 cars faster, more spectacular to watch and more challenging to drive, and few would argue against those basic ideas.

What there won't be is any major change to the hybrid V6 power unit rules, which protects the investments of the four existing manufacturers and may encourage others to move into the sport.

The FIA has kept speeds in check with regular rules changes, for obvious safety reasons. But the consensus is that cars have got safer and so have the venues, and that there is now sufficient margin to ramp up speeds and make the cars harder to drive. Exactly how (and if) the right formula is arrived at remains to be seen.

As an attempt to reduce car weight, it was intended to bring back refuelling for the first time since 2009. The thinking was that by not starting with a full fuel load, the cars would be lighter and thus faster in the first part of the race. But at the time of writing, the plan is highly unlikely to be adopted, in part due to teams providing data that showed there was less overtaking in the refueling era, as well as questioning its inherent safety.


Steve Etherington/LAT

The 2004 season is regarded as the fastest in Formula 1 history, with Ferrari's dominant F2004 (ABOVE) setting lap records that still stand at seven tracks on the 2015 schedule.

Maserati's 250F was neither powerful nor groundbreaking. But in the dextrous hands of masters such as Juan Manuel Fangio, its excellent weight distribution and benign behavior provided a platform for imperious feats. (MAIN) Four seasons into the 250F's career, Fangio gracefully slides and corrects his way to victory in the 1957 Monaco Grand Prix.

WORDS Paul Fearnley | IMAGES LAT archive

La più bella

It only won eight Formula 1 World Championship grands prix, but the graceful Maserati 250F transcends "mere" statistics and remains the epitome of beauty in a racecar.

There are no points for elegance or style in grand prix racing. Function is everything in the tenths-gained short term. Yet those point-less attributes, ethereal and unquantifiable, are what create memories that linger longest. At worst they burnish success with a gloss that is slow to fade. At best they forge legends greater than the sum of their parts – the nuts, bolts and rivets – and more vivid than a final tally of wins and championships.

Maserati's charismatic 250F, for example, spanned 2.5-liter Formula 1 – we can safely ignore without rebuke its 750cc forced-induction element – from 1954-'60; it won its first race and finished 13th in its last. Between times it scored just seven other World Championship GP victories in seven seasons. It broke no new technical ground – its "innovation" reputedly was thieved from neighboring Ferrari – oozed oil from every joint, and suffered recurrent failures that should have been easily cured.

But, *boy*, she was beautiful – and would improve with age. No other would come close as the epitome of front-engined, cigar-shaped open-wheel racecars. Fashioned around a tubular space frame-style chassis by a fat man with a hammer – Medardo Fantuzzi was fluent in aluminum – in a bustling Modenese workshop that veered between happy-go-lucky and Johnny-come-lately, 250F encapsulated a feel for the sport as much as an understanding of it. Crafted rather than constructed, she blew in on a lulling breeze rather than the urgent wakes and eddies of a wind tunnel.

Facts-and-figures substance lay beneath that slinky skin, of course: a twin-spark, twin-cam straight-six based on an old sports car design and generating an unremarkable 240hp at 7,200rpm; a four-speed gearbox in-unit with the final drive; front suspension by unequal-length wishbones with interposed coil springs; rear by a de Dion tube located fore and aft by double radius rods and laterally by a ball rising, falling and pivoting within a central, vertical, bronze-lined channel.

Designer Giaocchino Colombo, of >

Stirling Moss's 1956 season at the wheel of a 250F delivered GP wins in Monaco and Italy. He also started from pole at his home race, the British GP, but retired with an axle problem (LEFT). (BELOW) Fangio cruises past the crashed Ferraris of Peter Collins and Mike Hawthorn on his way to victory in the '57 Monaco GP. His four wins that year would give Maserati's 250F its only F1 Drivers' World Championship.

pre-war Alfetta voiturette and post-war first-Ferrari V12 fame, sought to reduce the dumb-bell effect by placing more mass within the wheelbase, thus reducing polar moment of inertia and so increasing the car's willingness to change direction. Rival Lancia, with its quick but twitchy D50, pannier tanks slung between the wheels, sought the same effect, but had gone too far, too soon.

The itinerant Colombo saved that error for his subsequent mid-engined Bugatti Type 251, a genuine GP lemon; with 250F, he struck an excellent compromise. By unusually sweeping the de Dion tube ahead of the transmission – the "innovation" – he was able to slide the large fuel tank forward within the tail, while his neatly packaged transverse gearbox "over" the rear wheels compensated for any potential loss of traction.

Simple, strong and easy to drive, 250F hit its target market: privateers. From its 1926 inception, Maserati had made its racing cars available to wealthy amateurs, a trend continued by industrialist Count Adolfo Orsi after his 1937 buyout of eponymous fraternal founders Bindo, Ernesto and Ettore. (Sadly, Alfieri II was already five years dead because of a failed medical operation on an old racing injury.)

"It was certainly the nicest looking Formula 1 car – seeing it for the first time was a real thrill"

STIRLING MOSS

A total of 29 Maserati 250Fs were built from 1954 to '58 – grids would have been sparce without them – but until Argentina's President Juan Perón volunteered funding and Juan Manuel Fangio (whose hi-tech Mercedes-Benz wouldn't be ready until mid '54) there was no plan to run a works team. This change of tack ensured that 250F would be up at the sharp end, as well as padding a sagging midfield.

In Fangio's dextrous hands, and later those of Stirling Moss, too, it was discovered that the car's benign behavior could be taken gleeful, verging on wilful, advantage of. A mystical blend of weight distribution and weight of control made it a stable oversteerer, and the low grip of its narrow, hard tires could, by judicious application of throttle against steering, be "routinely" exceeded, balanced, sustained and reinstated.

Alhough there were outright faster cars, no other provided the same satisfaction for the driver, or thrill for the spectator. Case in point: Fangio "skiing" through the fearsome 130mph downhill sweepers at Rouen in 1957, scribing long and graceful arcs every lap on his way to victory in the French GP.

His subsequent German GP win at the Nürburgring, arguably the greatest drive in the championship's 65-year history, marked the zenith of a meandering development journey undertaken by a self-contained, but small company stretched both financially and logistically. It's noteworthy that Ferrari's lifesaving hardware handout from the disbanded Lancia team coincided with Perón's fall from power in 1955, a kick in the teeth for *Officine Alfieri Maserati*. With the D50s, following Mercedes-Benz' withdrawal from racing, went Fangio to Ferrari, too. >

MASERATI WINS AT THE BRICKYARD

Pre-World War 2, Maserati took two Indianapolis 500 wins, courtesy of three-time "500" champ Wilbur Shaw.

The 8-cylinder, twin-supercharged 8CTF had been built in 1938 to take on Mercedes-Benz and Auto Union in grand prix racing.

It fell short in that resect, but as the Boyle Special it had the reliability and power for Shaw to take back-to-back Indy wins in 1939 (BELOW) and '40. A collapsed wheel stymied a third win for the car in '41.

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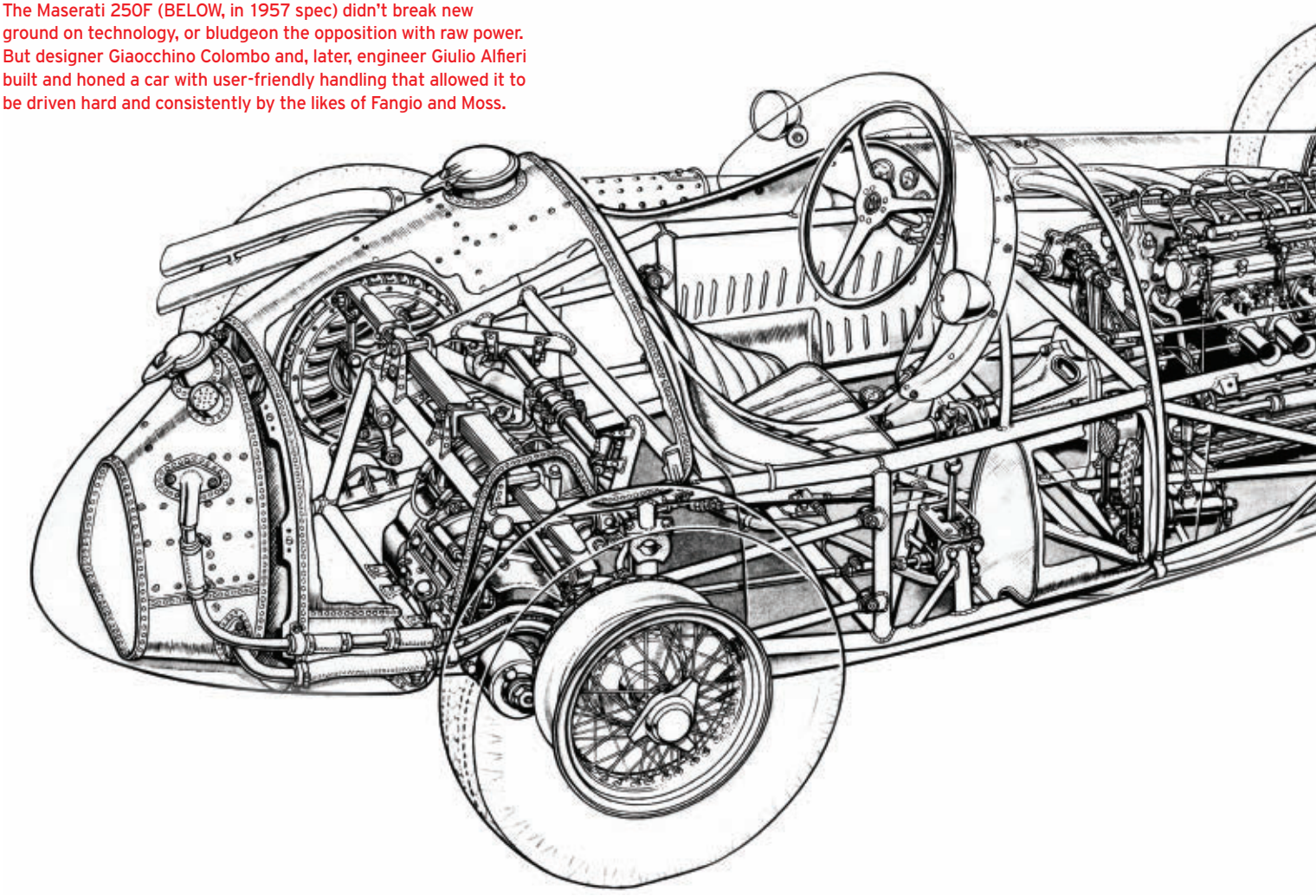
NO SECRETS UNDER THE SKIN

The Maserati 250F (BELOW, in 1957 spec) didn't break new ground on technology, or bludgeon the opposition with raw power. But designer Giaocchino Colombo and, later, engineer Giulio Alfieri built and honed a car with user-friendly handling that allowed it to be driven hard and consistently by the likes of Fangio and Moss.



The loss of the latter midway through 1954 had already cost Maserati a world title. The winner of that season's Argentine and Belgian GPs was only on loan from a tactically delayed Mercedes-Benz program, and his departure left Maserati without a frontline driver, while making all the difference to a rival team that occasionally was left gasping, despite its air of technical superiority.

Into Maserati's breach stepped a 24-year-old Englishman. After two fruitless seasons stubbornly attempting to win in makeweight British machinery, Moss had spent £5,500 (around $15,000 at the time) of his money on a 250F – "my first real racing car"– in the hope of proving his GP worth. He promptly finished third at Spa to score his first World Championship points, and then set joint fastest lap at Silverstone – along with six other drivers! – and qualified on the front row at the Nürburgring. Told by Maserati to no longer worry about costly

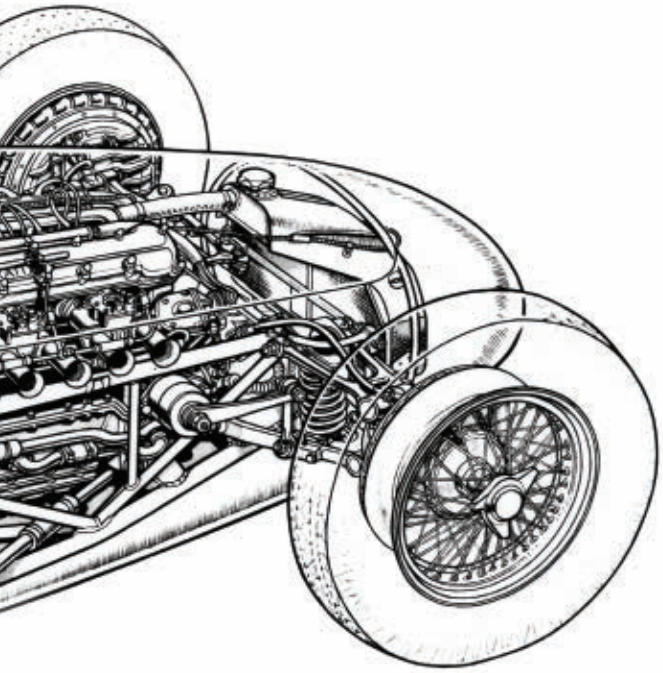
engine rebuilds, his green machine was painted works red overnight. Fastest in a wet practice session at Berne in Switzerland – a performance that persuaded Mercedes-Benz to consider him for 1955 – he would have won the Italian GP at Monza but for a broken oil pipe. Not until he returned to Maserati in 1956, however, would 250F win again at the highest level.

Replacement team leader Jean Behra, a colorful Frenchman with a "Van Gogh" temperament and, courtesy of his sports car crash in the RAC Tourist Trophy at Ulster's Dundrod, only one ear, would remain with the team until the end of 1957 and win several non-championship races.

But it was young Italian Luigi Musso who scored its best World Championship result of 1955: third place in Zandvoort's Dutch GP. (Behra had to share the points for his third place at Monaco with teammate Cesare Perdisa.) The updated 250F, meanwhile, boasted smoother bodywork with fewer louvers, an excellent five-speed gearbox, larger drum brakes and a single big-bore exhaust in place of twin pipes.

More changes came thick and fast in 1956. Talented young engineer Giulio Alfieri was put in charge of the program and he rather lost his way in a rushed bid to make his mark. Fuel injection and disc brakes came and went, as did an update of the shaped-by-hunch 1955 streamliner that Moss reckoned to be "a dead loss." Anything that cost 250F its cherished drivability – a reduction in torque or a

(LEFT) Fangio's 250F and Moss's Vanwall lead at the start of the 1957 Monaco GP. At this point, the Maserati was showing its age, yet still delivered Fangio's fifth title.

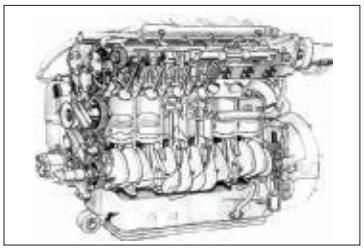


MASERATI 250F

29 Maserati 250Fs were built. At least one example appeared in 46 F1 World Championship grands prix (Jan. 1954-Nov. 1960), with 277 individual entries.

POWER? NOTHING SPECTACULAR...

By 1957, Maserati's 2.5-liter straight-six put out a nitro-assisted 270hp, up from 240 in original '54 guise. Ferrari's Lancia D50-based 801 was closer to 290hp.



FORMULA 1 FOR ALL...

The Maserati 250F was F1's first true go-to car for privateer entrants.

- In '58, post-factory era, 22 drivers made at least one GP entry in a 250F.
- The 250F's final GP start was Bob Drake in the 1960 U.S. GP at Riverside.

PERFECT CURVES

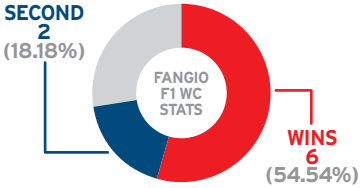
Wind tunnel? *Neanche per sogno!* Medardo Fantuzzi defined 250F's lines from experience and aesthetics alone.

Paul Laylette

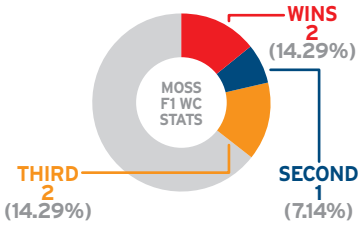
TWO MAESTROS

Given that only two drivers scored World Championship GP victories with the 250F, it's fitting that they are among Formula 1's all-time greats.

JUAN MANUEL FANGIO
(11 total F1 WC starts)



STIRLING MOSS
(14 total F1 WC starts)



Next best 250F pilots at F1 World Championship level are Jean Behra (two seconds and five thirds) and Luigi Musso (one second and one third).

BRING A CHANGE OF CLOTHES...

Jean Behra led Maserati's challenge in 1955, before playing second fiddle to Moss in '56 and Fangio a year later. Like all 250F drivers, the Frenchman had to live with its sketchy reliability. (ABOVE) Behra wears the results of an oil leak in practice for the '57 French GP.

narrowing of its power band, say – cost it lap time. Moss's domination of the Monaco GP was achieved using a four-speed gearbox and Weber carburetors because the basic design was fundamentally sound. Yet poor reliability remained an issue.

Alfieri learned his lessons and applied them to the "Indian Summer" iteration of 1957. Based on Moss's longer, lower, wider winner of the 1956 Italian GP, albeit minus its offset engine that dropped the driver's seat by eight inches within a higher-sided cockpit, these "Lightweights" featured a chassis closer to a true space frame (i.e. every strut in compression or tension) and made of thinner-gauge tubing. A slug of nitro in the usual benzole/methanol mix boosted power to 270hp at 8,000rpm. Bodywork was yet smoother and sleeker, with a full wraparound Perspex screen and fared headrest. Brakes – yep, still drums – were expanded and exposed to the cooling airflow by offset Borrani knock-off wire wheels. On an operational level, just three were built and their identical spec was to remain unaltered unless a development sampled on the official *muletta* test hack proved beneficial.

"[The Maserati 250F] was a very driver-friendly car, responsive to any changes you made to it"

STIRLING MOSS

The factory team, meanwhile, was cordoned from hassling, hustling privateer mechanics at the HQ on Viale Ciro Menotti. And on the driver front, a returning Fangio flourished in an upbeat atmosphere after a downtrodden, albeit successful season with Ferrari, while Behra was happier to play second fiddle to the revered 45-year-old South American than he had been with the upstart Moss. >

(ABOVE) Fangio wins the 1957 German GP. (FAR LEFT) In 1958, 250F-equipped Maria Teresa de Filippis became the first woman to start a GP; (LEFT) Behra heads Fangio, Argentina '58.

"250F was very important in my career – pivotal – because it got me the drive with Mercedes-Benz"

STIRLING MOSS

Maserati had got its act together just in time. A 1-2-3-4 result in the '57 season-opening Argentine GP triggered a strong first half to the season, and Fangio had claimed his fifth world title by early August – by which time Moss had given notice of a changing of the guard by winning July's British GP at Aintree in the British-made Vanwall. His subsequent victories in the Maserati heartlands of Pescara and Monza further emphasized how 250F was becoming a dinosaur. Built in the old, sturdy tradition, it would be unsuited to the 300km (185 miles) – or two-hour – "sprint" GPs dictated for '58 and beyond.

Fangio promptly retired in all but name and Maserati went bust in all but name (Italian bankruptcy is more sympathetic than some...). The firm's complex replacement V12, tested often but raced rarely in 1957 (its peaky delivery upset the balance of the 250F) might have kept it competitive against the four-cylinder, ugly-bug Coopers and their rear-engined GP ilk because its smaller valves and bores were better suited to the compulsory, hotter-burning Avgas fuel, but an all-costs bid to beat Ferrari in the 1957 World Sports Car Championship had resulted in Maserati's racing ruination.

Three more, smaller and lighter (by a not insubstantial 160lb) 250Fs, nicknamed Piccolo, were built for 1958, and Fangio, obliged to his good friends at struggling Maserati, drove one to fourth place in the French GP at Reims. That result was matched by American enthusiast Temple Buell's version when shared by Masten Gregory and Carroll Shelby at Monza. And that was that, bar Valerio Colotti's 250F-based Tec-Mec flop of 1959; with clingy, skimpy bodywork, it was mutton dressed as lamb.

Even its undignified end, however, cannot dim the star quality of GP racing's most elegant and stylish performer. ■

MOSS ON THE 250F

THE MAKING OF STIRLING

A young man with an eye for the ladies driving in an impossibly relaxed fashion: Stirling Moss had always acted and looked the part. But it was the sensuous 250F that turned "The Boy" into a man.

"It was certainly the nicest looking F1 car – seeing it for the first time was a real thrill," he recalls. "But it would have been better had Mercedes-Benz built it. My 1954 car [chassis 2508] was an early version and we had quite a lot of problems – Maserati couldn't get hold of quality materials, and that let it down.

"My mechanic, Alf Francis, stayed at Modena while it was being built, helping out and learning about the car. One night, after Fantuzzi had gone home, he moved the bulkhead loop five inches further forward because I wanted to drive with my straight-arms position; Maserati didn't want to do that.

"It was a very driver-friendly car, responsive to any changes you made to it, and you could set it up to suit your style. It never had much horsepower, even when we tried nitro-methane, but its balance made it a good car for places like Monaco where maneuverability is important. It had good brakes, too, though I eventually put discs on mine. The latter proved better under certain conditions; at Monaco, at slow speeds, the drums were excellent.

"250F was very important in my career – pivotal – because it got me the drive with Mercedes-Benz [for 1955]. It was a very good learning car. The Mercedes-Benz W196 was so much more sophisticated and wasn't as nice to drive and I realized that I still had a lot to learn, but 250F had taught me a lot even so."

(ABOVE) Stirling Moss's first 250F win was the non-championship International Gold Cup at Oulton Park, England, in 1954.

Main: Bob Pengraph. Others: courtesy SVRA

HISTORY REPEATING AND COMPETING

(LEFT) A Galaxy not so far away – Coronado offers a special backdrop for those who love planes and automobiles. (TOP) Extreme grid variety at Circuit of The Americas. (ABOVE) Fan access to cars and drivers is an SVRA calling card.

The appeal of historic racing is easy to see at SVRA events, but it's also easy to understand. It's all about value to participants and fans.

History is made every day, as they say, which may explain why historic racing is the sport's fastest growing segment.

Sportscar Vintage Racing Association events aren't merely racecar and driver "hobby" get-togethers. At each one, the SVRA endeavors to capture the flavor of specific periods in time, giving established fans a broad cross-section of motorsport heritage, while trying to draw in those who are new to racing.

Has it been a success? Well, this was the first year in which the SVRA ran the Portland Vintage Racing Festival and the car count was almost doubled from the year before. In addition, spectator turnout was a 10-year record.

In addition to vintage race viewing, the Festival offered spectators auto cross, off-road driving, on-track touring, hot-lapping, last lap of the day drives for car show participants, Army tanks doing lunchtime laps, an evening rock concert and fireworks. Two local TV news teams covered the event, taking part in hot laps, interviewing SVRA CEO Tony Parella and several vintage racers, producing a feature on the grand marshal Lyn St. James, and then broadcasting these segments at varied times of day.

The most appealing aspect of SVRA events, for many fans, is the access they have to the racers, the majority of whom are always willing to talk about their racecars. So why not experience that for yourself at Coronado, Calif., in September or the Circuit of The Americas, Texas, in November?

The Coronado Speed Festival with San Diego Fleet Week features three days of vintage racing, car shows, a pit crew challenge and military displays staged on the runways of Coronado North Island Naval Air Station. The Festival is the premier event of the Fleet Week activities, and serves both as an open house for the base and a tribute to the branches of the military with operations in San Diego.

The twisty, 1.7-mile course utilizes the runways and taxiways of the Naval Air Station and provides exciting racing. A special feature race for NASCAR stock cars is certain to be one of the highlights of the weekend.

The U.S. Vintage Racing National Championship at CoTA has become one of the most popular vintage and historic racing events in America. In 2015, more than 400 competitors from around the world will compete to take home a coveted Bell Racing National Champions helmet. The contemporary Trans-Am Race Series will be a featured guest in 2015, with the 11th race in its nationwide series.

There is also a Texas-sized car show scheduled for Saturday afternoon, and the Saturday night SVRA party is legendary. There'll be a Texas-style BBQ dinner, a fireworks display like no other, and The Marshall Tucker Band will put on a concert in the paddock.

So head to an SVRA event. There's something unique about each one, but the core spirit of engagement with competitors and fans is common to all.

Go to **SVRA.com** for news bulletins, event schedules, membership info and all regulation details.

2015 SVRA SCHEDULE

AUG. 20-23	POCONO VINTAGE FESTIVAL with INDYCAR Pocono Raceway, Pa.
SEPT. 18-20	CORONADO SPEED FESTIVAL with SAN DIEGO FLEET WEEK Naval Air Station North Island, Coronado, Calif.
SEPT. 24-27	HEACOCK CLASSIC GOLD CUP Virginia International Raceway, Va.
OCT. 8-11	MARDI GRAS IN OCTOBER with CVAR NOLA Motorsports Park, La.
NOV. 4-8	U.S. VINTAGE NATIONAL CHAMPIONSHIP Circuit of The Americas, Texas

KEY East Coast Season West Coast Season

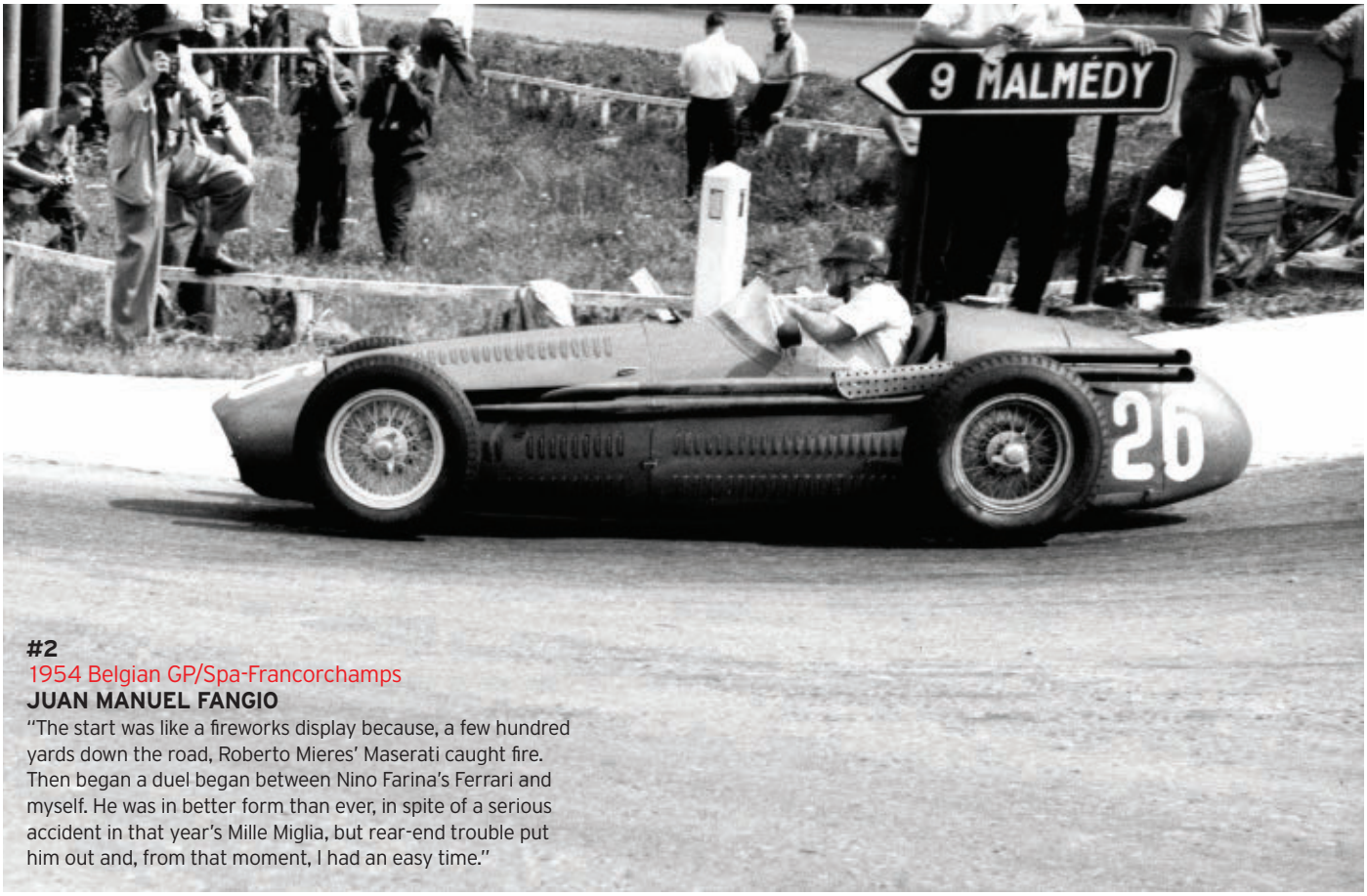
BACK TO THE BRICKYARD

Less than a month after the second Brickyard Vintage Racing Invitational, SVRA and Indianapolis Motor Speedway confirmed the event will be held again in 2016, with track president Doug Boles stating his intention to "grow the event each year."

Super Eight

GP greats Juan Fangio Manuel and Stirling Moss shared 250F's victories at the highest level, with six and two, respectively. These are their recollections from the autobiography *Fangio* and *Stirling Moss – All My Races*.

#1
1954 Argentine GP/Buenos Aires
JUAN MANUEL FANGIO
"It began to rain and I stopped to change tires. Nello Ugolini, Ferrari's technical director, thought he saw five mechanics changing my wheels; the rules permitted three. The two extra had bent down to check an oil leak and they did not touch the car. Soon after, [Ferrari's Giuseppe] Farina slid on wet asphalt and lost precious time. I went by and took the lead. The public warmly cheered as the judges rejected the Ferrari objection."

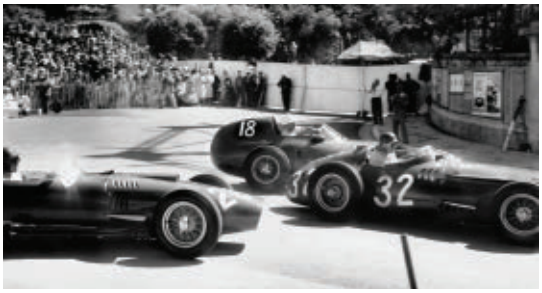


#2
1954 Belgian GP/Spa-Francorchamps
JUAN MANUEL FANGIO
"The start was like a fireworks display because, a few hundred yards down the road, Roberto Mieres' Maserati caught fire. Then began a duel began between Nino Farina's Ferrari and myself. He was in better form than ever, in spite of a serious accident in that year's Mille Miglia, but rear-end trouble put him out and, from that moment, I had an easy time."

#3
1956 Monaco GP/Monte Carlo
STIRLING MOSS
"Teammate Cesare Perdisa's car was rigged with a right-hand throttle like mine – rather than Maser's traditional centre throttle – to provide for the possibility of my needing to take it over during the race. I had an excellent start *[LEFT, Moss (28) and the Ferraris of Fangio (20) and Eugenio Castellotti lead at the start]* and led all the way. About 20 laps before the end I hit Perdisa up the rear when he braked on the straight. Apart from that it was very straightforward."

#4
1956 Italian GP/Monza
STIRLING MOSS
"The Lancia-Ferraris quickly asserted themselves... Happily for me, this turned out to be short-lived. On the fifth lap Eugenio Castellotti and Luigi Musso paid the price for pushing too hard, too soon, and their rear tires started throwing treads. Fangio stopped with damaged steering and Harry Schell's Vanwall retired after 28 laps, from which point I built up a one-minute lead – until I ran out of fuel and had to be pushed into the pit lane by Luigi Piotti's private 250F! *[ABOVE]* I won by five seconds."

#6
1957 Monaco GP/Monte Carlo
JUAN MANUEL FANGIO
"On the fourth lap Moss *[No.18]* came up too fast to the Chicane. Behind the sandbags were posts strong enough to stop a train; I winced when I saw the Vanwall disappear in a cloud of sand. Ferrari's Peter Collins steered towards the outside barrier, which prevented him falling into the sea. I managed to brake enough to arrive at walking pace. Behind me, posts almost entirely barred the road. So I won easily, with little credit to claim for such a chance victory."



#5
1957 Argentine GP/Buenos Aires
JUAN MANUEL FANGIO
"In the lineup were seven Maseratis and seven Ferraris. I left my opponents to their own worries in the first few laps. Stirling Moss's accelerator broke after 16 laps and he lost more than 13 minutes. On the 20th lap, I decided it was time to attack. One by one I passed my rivals to take and hold the lead for the rest of the race. Maserati took the first four places – a crushing defeat for Ferrari."

#7
1957 French GP/Rouen
JUAN MANUEL FANGIO
"I made a bad start and had to make up a lot of lost ground until finally I found an ace up my sleeve. I discovered that it was possible to come into the so-called New World corner at high speed, put my car slightly cross-wise and hold it by progressively accelerating. Only once did I skid a bit, scratching the nose of the Maserati *[LEFT]*. After that, all went well, although the track had become quite dangerous from spilt oil."

#8
1957 German GP/Nurburgring
JUAN MANUEL FANGIO
Marcello Giambertone, Fangio's agent: "It was known that the Ferraris could do the race distance without tire changes and refuelling. Halfway through, Juan had a 28-second lead, not enough to let him rest on his laurels as he had to refuel. Peter Collins and teammate Mike Hawthorn were 38sec ahead and Fangio let loose the most spectacular pursuit of his life. The record was broken every lap. Finally Ferrari caught on and ran up the alarm signal. Too late. On the penultimate lap, Fangio passed them both. And who could catch Juan again that well-favoured day?" *[RIGHT, Fangio (middle) on the podium with Collins (left) and Hawthorn.]*

CONSIDERABLY MORE THAN POINTLESS...

Outside of the Formula 1 World Championship, the Maserati 250F won 27 significant non-points races on four continents (Europe, South America, Africa and Australasia), the last one coming in 1958.

As you might expect, Stirling Moss set the ball rolling with a win in the 1954 BARC 200 at Aintree, England. He added five more non-championship wins that season, culminating in October's *Daily Telegraph* Trophy, again at Aintree.

Moss's non-points success continued on his return to Maserati in 1956, with five more wins, including the Australian GP.

• Although he never won an F1 World Championship GP for Maserati, Jean Behra did take five non-points victories between 1955-'57.

• Final win for the 250F came with Juan Manuel Fangio at the 1958 Buenos Aires City GP.

WHERE **EAGLES** DARE

Dan Gurney's 1972 Eagle Indy car was fast – *unbelievably* fast – and it was for sale, too. With the orders flooding in, it would dominate for four seasons.

WORDS Robin Miller | STUDIO IMAGES Peter Harholdt

It was the perfect storm: a rulebook ripe for the picking converged on by a wily, free-thinking leader oozing with racing savvy; a top shelf driver who understood chassis and lived for taking it to the edge; a sharp, aggressive engine man who couldn't get enough RPMs, and a quiet, unknown thinker from the aerospace industry with designs on making a big splash in Indy car racing.

That was the potent lineup at All American Racers in 1972 as Dan Gurney, Bobby Unser, John Miller and Roman Slobodynskyj created an Indy car for the ages that was copied, bought and raced with unparalleled success for five consecutive seasons.

The Eagle 7200 didn't just break new ground, it sent a tremor through the United States Auto Club, destroyed the record book and shook the status quo to its very foundation.

"Dan built a killer car, Roman did a good job, John gave me great power. And of course they had the right driver"

BOBBY UNSER

"Dan built a killer car, Roman did a good job, John gave me great power, and I think we had a better team than we knew," says Unser, who captured 10 races for AAR from 1972-'76 including the 1975 Indianapolis 500. "And of course they had the right driver to develop it."

Gurney's genius for creativity was never more alive than that period of Indy car history, when aerodynamics ascended and speeds exploded. "We didn't know what the limits were and we were peering into the unknown," says The Big Eagle. "It was an exciting time."

The genesis for the '72 Eagle was the 1971 McLaren M16, a sleek-looking creation from Formula 1 guru Gordon Coppuck that riled Gasoline Alley because of its engine cover that sported a wing. USAC rules said any aerodynamic device had to be an integral part of the bodywork and Coppuck cleverly created an advantage as Peter Revson blistered the Indianapolis Motor Speedway record by >

EAGLE 7405: 1975 INDY 500 WINNER

Designer Roman Slobodynskyj says he didn't expect the 7200/7300/7400 series of Eagles to dominate like they did. But getting the design so fundamentally right in 1972 ensured that it was still a winning proposition four seasons later.

almost 9mph in winning the pole position.

Even though Unser took seven poles and a pair of victories in his '71 Eagle, Gurney and Co. knew that it was back to the drawing board...

"We were competitive for pole positions and wins because John Miller and Dan were willing to stroke the dickens out of things," says Unser with a chuckle. "But we knew we needed a new car to try and get ahead of the McLarens."

During the winter USAC announced that free-standing wings would be allowed for 1972, provided they weren't attached to the suspension, and Gurney put AAR on the fast track by coming up with a 1/10th scale model for a wind tunnel which produced some beneficial ideas.

Slobodynskyj, who had begun his AAR employment a couple years before as a part-timer doing detail work on gearboxes and cylinder heads, had caught Gurney's eye in 1971.

"The 1970 Eagle had a lot of problems so I made some suggestions and Dan liked the modifications I made," recalls Slobodynskyj. "Tony Southgate had left so I was full-time by then and Dan promoted me to head designer.

LAT archive

1972: THE MYSTERY EAGLE

Jerry Grant's AAR-run "Mystery Eagle" was comfortably leading Indy when a wheel vibration led to an unscheduled, messy stop. A subsequent penalty left him 12th.

"McLaren had been a call to arms, and we knew we had to come up with something good if not better. So we pushed the limits where we could and we went for it. Those were the good old days."

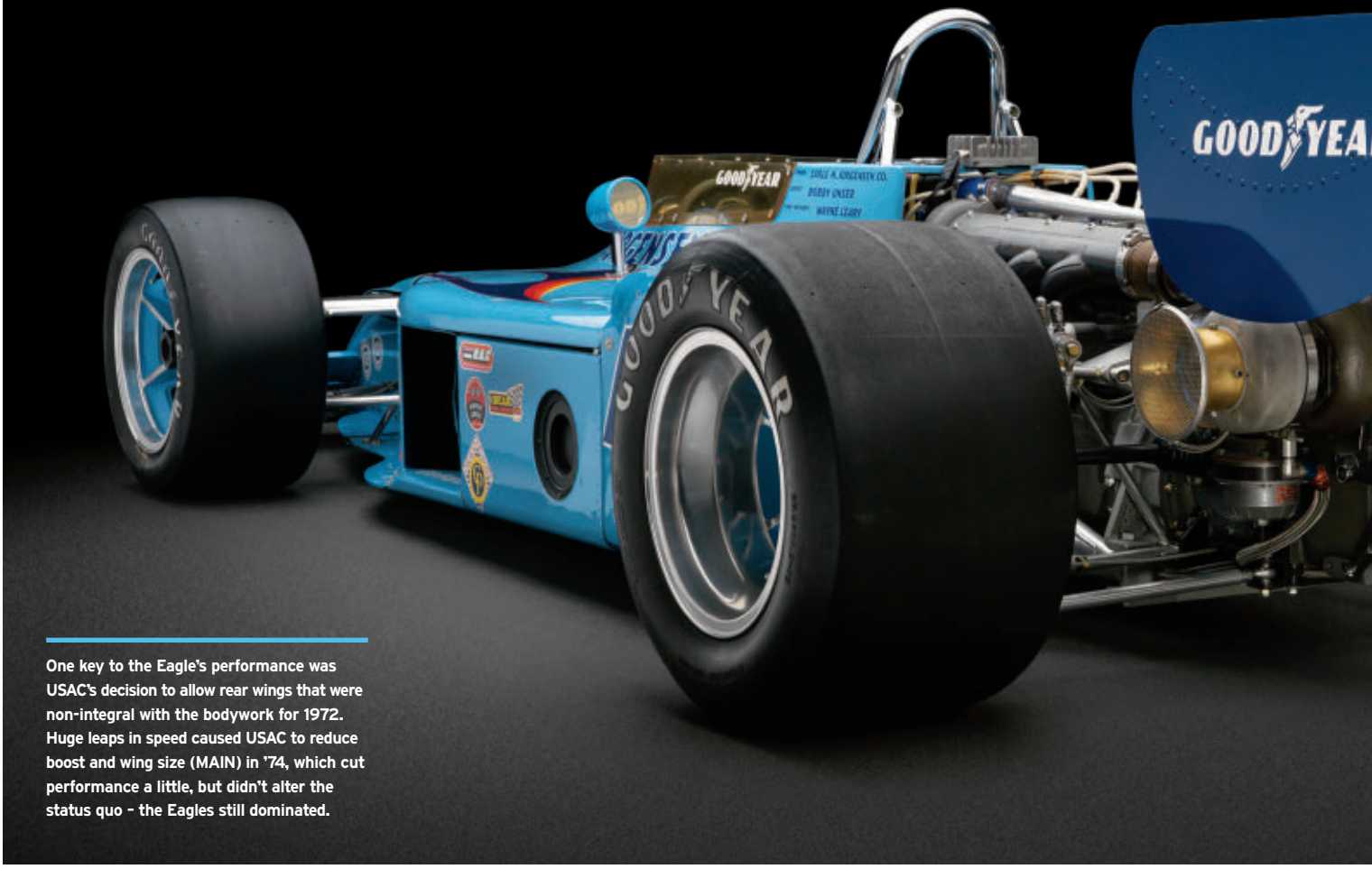
Indy cars carried 75 gallons of fuel back then and Roman had a couple of major objectives.

"I wanted the polar moment to be as close to CG (center of gravity) as possible, I wanted the fuel low and as close to CG as possible, and I wanted the radiators in front of the fuel," he explains. "Plus, I wanted to keep the roll center as stable as possible, relative to the CG. And I wanted to feed the wings as much air as possible."

Adds Gurney: "Roman was very good at packaging things and knew a thing or

"It was good on the track straight away; we just didn't know how good until we got a little further into it"

DAN GURNEY



One key to the Eagle's performance was USAC's decision to allow rear wings that were non-integral with the bodywork for 1972. Huge leaps in speed caused USAC to reduce boost and wing size (MAIN) in '74, which cut performance a little, but didn't alter the status quo – the Eagles still dominated.

two about aerodynamics. It was an unknown area, but that's where Indy car racing was headed. And I also wanted to make sure we provided a friendly spot for the turbocharged Offy."

Another key component was the infamous Gurney flap, which had come out of its founder's mind following three days of going nowhere in a test at Phoenix in late 1971. A thin strip of aluminum folded at a 90-degree angle and pop-riveted to the trailing edge of the rear wing was instant magic – and downforce.

Gurney had experimented with wings on his F1 Eagle in 1968 and he struck a friendship with Bob Leibeck of Boeing, who pitched in to help with the '72 Eagle. "We tried 20 different types of rear wings and Bobby did most of the testing, but we paid attention and found something we liked," says the AAR founder.

Also collaborating were Champion Spark Plug's Dick Jones and Art Lamey, along with Fred Carrillo, who built some special rods for the Miller-prepared Offenhauser. Drake Engineering produced lighter pistons for Miller's short-stroke powerplant, and Leo Goosen developed a pair of oil scavenge pumps that also improved horsepower.

IMS archive

1973: GORDON JOHNCOCK WINS

Johncock's Pat Patrick-entered, 7300-spec STP Eagle prevailed in the accident and rain-blighted '73 "500," earning the team $236,000 and, er...a personal hovercraft.

Unser also credits a special turbocharger discovered by Miller as a big boost in the project but, amazingly, the outspoken veteran from Albuquerque had no input in the design of the 7200.

"Dan had forbid me from going into the design room, but that was OK, I shouldn't have," he declares. "I didn't need to because I could pick a hair out of a bowl of soup real quick. I could tell immediately whether things were right or wrong as soon as I got in the car."

The first test at Ontario Motor Speedway in December of 1971 was either good, disappointing, or somewhere in between – depending on who's talking.

"I think we realized it was very good before we even hit the track based on what we saw in the wind tunnel," says Gurney. "And it was good on the track straight away; we just didn't know how good until we got a little further into it."

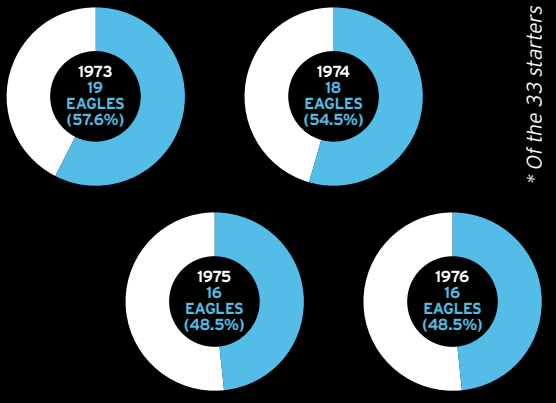
Unser recalls it being "as good a handling car as I ever drove and a keeper, but I couldn't go quick down the >

THE CAR OF CHOICE

The speed of the 1972 Eagle sent customers flocking to All American Racers for '73, including Penske Racing, which bought a 7300 for defending winner Mark Donohue.

A FLOCK OF EAGLES

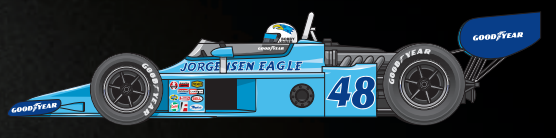
Eagle's numerical domination of the Indianapolis 500 between 1973-'76 would only be surpassed when March packed the field in the early 1980s, peaking at 29 cars in '84.



** Of the 33 starters*

EVOLUTION, NOT REVOLUTION

Minimal changes from the 7200 Eagle to its final iteration, the 7400 (BELOW), included a mandatory smaller fuel tank and rear wing, a narrower cockpit, and revised underbody aero.



straightaways. So we came back to Ontario and John Miller gave me a real engine with good power. I was hauling that thing so hard into the corners and pushing 200mph. All of the sudden we knew we had a fast racecar."

Slobodynskyj says: "It was a dog down the straightaway, then we changed engines and the thing woke up. But it was hard to predict it was going to be as fast as it turned out."

The season opener at Phoenix was a preview of things to come as Unser stomped the track record in qualifying and easily won. He erased the mark at Trenton next, but broke in the race.

In May at Indy, the McLarens of Gary Bettenhausen and Peter Revson topped 190mph, before the Olsonite Eagle flexed its muscle and Unser threw down a lap of 194.721mph three days before time trials. He demolished the IMS record by 17mph with his 195.940mph average that also included two laps of 196-plus.

Murenbeeld/LAT

1974: THE RELIABILITY FACTOR

Yes, a significant element in Bobby Unser's 1974 USAC National Championship was reliability – just one DNF all season – but four wins and five seconds sealed the deal.

Revson was second fastest, but *3mph* behind the '68 Indy winner, while Mark Donohue completed the front row in his McLaren, 4mph slower than the polesitter.

Unser led the first 30 laps of the race and was cruising along when the ignition rotor failed. "The 'experts' said Bobby killed it because he was driving too hard," says Unser, "but nothing could have been further from the truth. I was driving so easy, backing off in the corners and it was a piece of cake. I lapped my brother Al in 27 laps and it should have been the easiest Indy win ever."

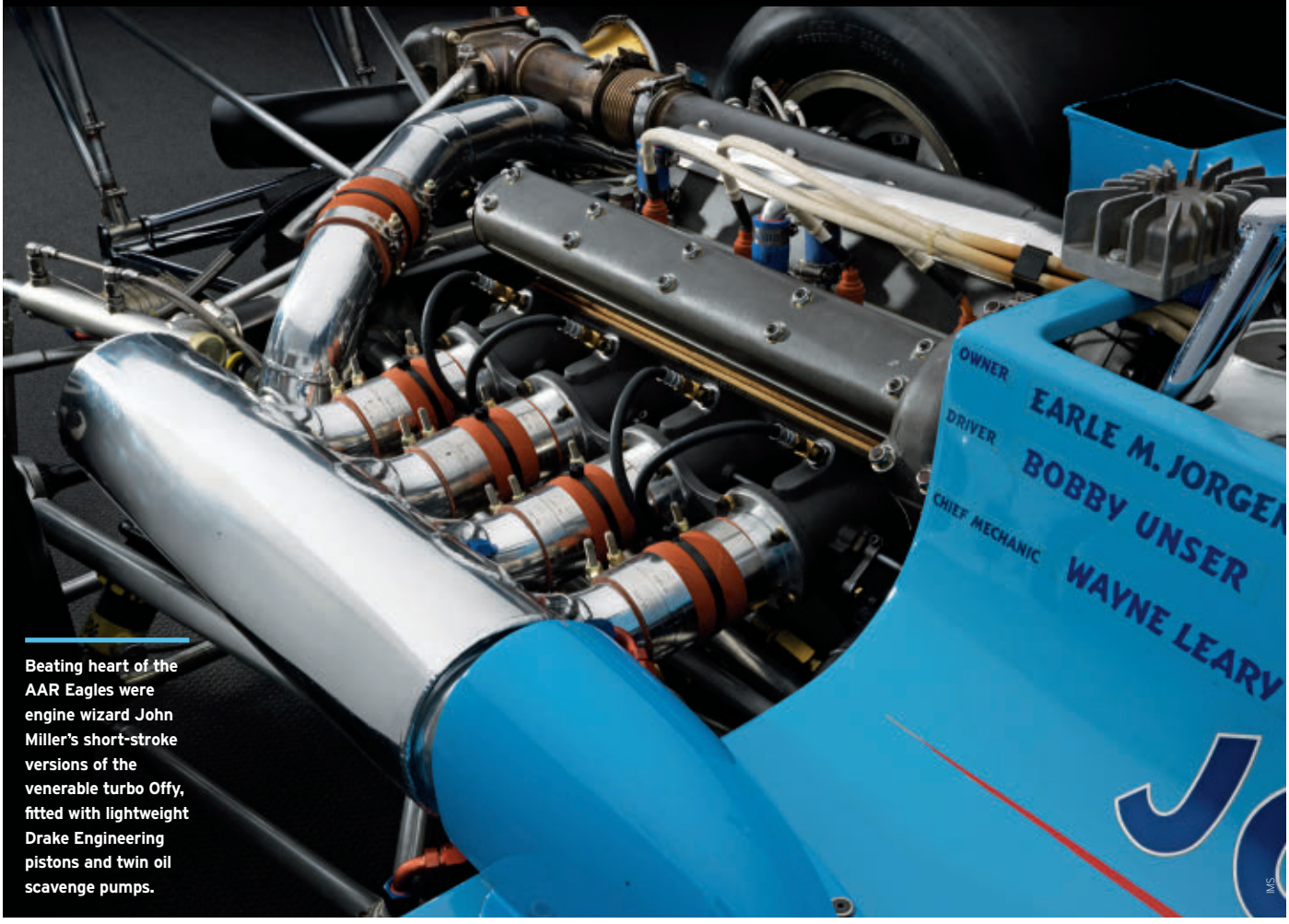
The totals at the end of '72 were nine track records, seven pole positions, four wins and 520 laps led out of the 905 he completed. But Unser only finished eighth in the final points because of five DNFs.

"I should have won every race if the engines would have stayed together, but John Miller and I loved horsepower," says Uncle Bobby, who was miffed because teammate Jerry Grant became the first to officially break 200mph at Ontario that fall after the former's car broke in qualifying. "Looking back I guess we should have backed it down a bit."

But Unser and the Eagle had made a huge statement and AAR was flooded with car orders for the 1973 season. >

IMS archive

McLaren's M16 was a starting reference for the Eagle 7200. The M16 continued to be the Eagle's most enduring competitor, winning the Indy 500 in both 1972 and '74 (ABOVE).



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Beating heart of the AAR Eagles were engine wizard John Miller's short-stroke versions of the venerable turbo Offy, fitted with lightweight Drake Engineering pistons and twin oil scavenge pumps.

PUMA

made to **win**

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The new PUMA SL Tech Mid Pro shoe culminates the ultimate recombinant design of the Future Cat Hi Pro L with the Future Cat Mid P Pro features into the most desirable driving shoe for professionals today. The PUMA SL Tech Pro is constructed of premium full-grain leather, an oil-resistant rubber outsole, a form-designed Velcro closure offering customized comfort and fit in a Mid-top platform, and a 25% weight reduction over other conventional designs. Unique multi-panel, internal seam, pre-formed leather construction with high toe box creates the ultimate durability, fitment, and comfort for long driving stints. Newly paneled backing of the shank at the Achilles tendon improves fire protection while ensuring freedom of movement front to rear at the ankle without sacrificing the necessary ankle protection from side-to-side.

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Subé Sports

"We were trying to be friendly to the buyers and didn't want to gouge anybody, but we sold the cars way too cheap and it was my fault for not realizing it," says Gurney, whose Eagles went for only $15,000, until eventually he raised the price to $36,000.

In 1973, 19 of the 33 starters at Indy were Eagles, including winner Gordon Johncock's Pat Patrick-entered, STP-backed 7300, and eight of the season's 16 races were won by Eagles (although only one went to Unser).

In 1974, Unser triumphed four times and earned the National Championship for AAR as 15 new Eagles were constructed that year and comprised over half the field (18 of 33) at Indianapolis.

"That championship was all Dan," says Unser. "He de-tuned me and we won the championship, but I wasn't that happy because I was a guy who liked going fast and leading."

Twice a runner-up as a driver at Indy (in 1968 and '69), Gurney finally found victory lane in 1975 with Unser and paused long enough to celebrate.

"That was our dream and our goal from the start and it was a terrific day," says Gurney, who remains one of only three men (with Jack Brabham and Bruce McLaren) to drive his own car to a Formula 1 grand prix victory.

While there were 16 starters in Eagles in 1975 and '76 at Indianapolis, no new ones had been mde since the 15 built in 1974, when USAC changed the specs on fuel capacity (75 gallons down to 40), rear-wing width and boost.

But, incredibly, that original '72 Eagle (with some small modifications) ran up front for five years – amassing 25 wins with five different drivers, a pair of Indy 500 victories, and USAC's National Championship in '74. Only A.J. Watson's roadster approached Gurney's Eagle in terms of performance and longevity.

"Nobody ever designed or built a better car that lasted for so many years and sold so many cars," says Unser. "Everybody wanted an Eagle and everybody liked them.

"There's never been anything like that car's history and I know there never will be. It was very special." ■

IMS archive

1975: AAR'S FIRST "500" WIN

The third Indy win for an Eagle was the first for Dan Gurney's All American Racers. Rain on lap 174 curtailed a Bobby Unser/Johnny Rutherford duel, Unser taking the victory.

DAN GURNEY

"The Big Eagle" ended his driving career in 1970, but can count four Formula 1 grand prix victories, a win in the 1967 24 Hours of Le Mans and two runner-up finishes at Indy among his on-track accomplishments.

The final iteration of the design, the Eagle 7400, saw All American Racers starting to look at how a racecar's underbody could be used to produce effective downforce.

The 1968 Eagle, the Mark 4, finished 1-2-4 at the Indy 500. Bobby Unser's Bob Wilke-entered car (MAIN) headed home Dan Gurney's AAR factory car, with Denis Hulme's AAR machine in fourth.

GURNEY'S INDY FAVORITES

IF DAN HAD TO CHOOSE JUST ONE...

We asked "The Big Eagle," Dan Gurney, to choose his favorite Indy car – and it may not be the one you think.

Asking Dan Gurney to name his favorite Eagle Indy car is like asking him to pick his favorite son; it's nearly impossible because he loves every one of them.

The first one in 1966, the Len Terry-penned, Lotus 38-based Mark 2, is special because, well, it was first.

And Gurney stuck 1967's Mark 3 in the middle of the front row, before back-to-back runner-up finishes in the '68 and '69 Eagles. That '68 design, Mark 4, also put an Eagle in Indy's victory lane for the first time, courtesy of Bobby Unser and owner Bob Wilke.

The 1970 version was sentimental since it was Dan's swansong as a driver and he finished third in his last "500," while 1972's 7200 and its subsequent iterations are right up there for what they achieved, including two Indy 500 wins and a national championship.

But Gurney's favorite is one that won a single race, yet ticks all the boxes for his enduring fascination with technology and innovation – the 1981 Pepsi Challenger.

"Yes, it was different and unique from an Eagle, but I'm most proud of that car; it was terrific and it's my favorite," he admits.

As an improved version of the 1980 Eagle that was All American Racers' initial venture into ground effects, designer John Ward came up with a sleek package that was way ahead of its time. It looked space age and ran like a rocket ship.

IMS archive

1981 PEPSI CHALLENGER

Like its 1980 predecessor, the John Ward-designed Eagle 8100 made downforce from boundary layer adhesion technology (BLAT), harnessing vortex flows underneath the car.

Unsung Mike Mosley qualified second at Indy with a normally-aspirated engine against all those turbos, but was thwarted by a blocked radiator in the race. Still, the combination came from last to first to win Milwaukee. It also was easily winning Riverside with Geoff Brabham, and Watkins Glen with Rocky Moran, when foiled by bad pit stops.

"It was unique in that it was a great road-race car and equally as potent on ovals, and I was so proud of it because our guys designed it, built it and improved it," adds Gurney, whose design was legislated out by CART's kangaroo court that winter.

"And what made it even better was when Ben Bowlby crawled under it a couple years ago here at the shop and digitized the bottom of it. He put it into CFD [computational fluid dynamics] and his eyes bugged out when he realized what they had, so they put it on the DeltaWing two weeks before Le Mans in 2012.

"Something AAR had done 30-some years earlier was still relevant – and that made us all feel good."

IMS archive


DUNLOP
4
MARTINI
PORSCHE

The 1977 24 Hours of Le Mans was perhaps the defining drive of Jacky Ickx's career. After his Porsche 936 retired, he jumped into its delayed sister car (LEFT) and put in a performance that pressured the faster Renaults into over-working their engines and earned himself, Jurgen Barth and Hurley Haywood a famous win – second of three for the 936.

LOW-KEY LEGEND

Just a place-holder between the 917 and 956? That's harsh on a car that took three Le Mans wins and forged Jacky Ickx's legend. It's time to reappraise the Porsche 936...

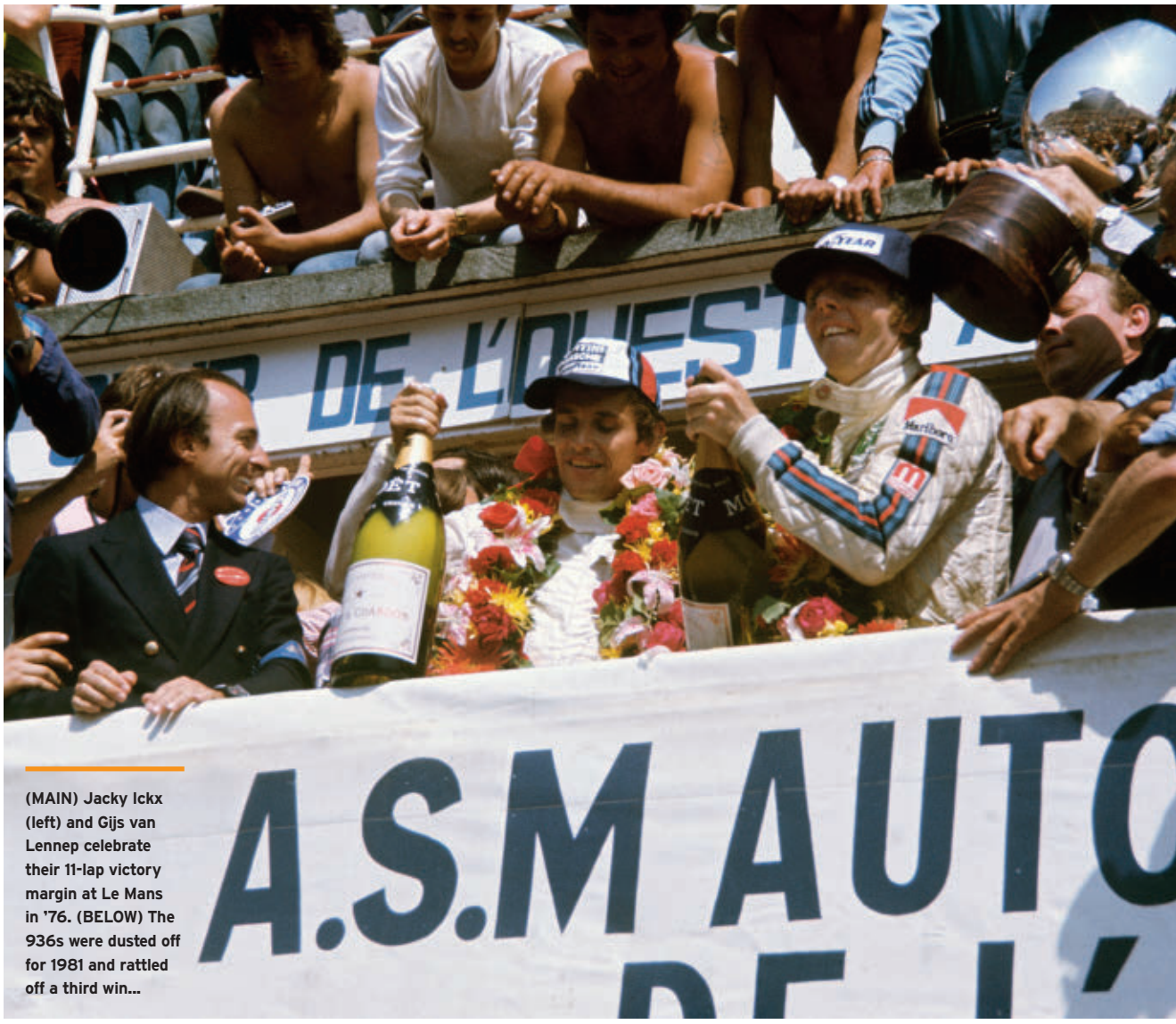
WORDS Gary Watkins
IMAGES LAT archive

The 936 is Porsche's forgotten hero of Le Mans. That's perhaps understandable for a car sandwiched between the legends that were the 917 and the 956/962 in the timeline of the German marque's prototypes. Yet it's a machine that won the 24 Hours on three occasions, allowed Jacky Ickx to drive his greatest ever race at Le Mans, set Derek Bell on the road to sports car stardom, and provided victorious proof of concept for the 956 Group C car's motive power.

That's not bad for a prototype that was designed and built in double-quick time and more than once dusted off and brought out of the museum to take its place on the starting grid at the Circuit de la Sarthe. And in comparison to cars that came before and after, it was made in tiny numbers. There were just three true factory-built 936s, and they shared out the three Le Mans victories for the car in 1976, '77 and '81.

Yet who was actually responsible for the decision to return to the prototype ranks at a time when Porsche was already a long way down the road with its 935 silhouette GT racer appears to have been lost in the mists of time. Norbert Singer, project leader on the 935 program, insists it was Dr. Ernst Fuhrmann, head of the Porsche board. Manfred Jantke, then racing boss for the Stuttgart marque, believes it was Prof. Helmut Bott, under whose remit motorsports fell in his role as research and development chief.

Singer remembers the decision being >



(MAIN) Jacky Ickx (left) and Gijs van Lennep celebrate their 11-lap victory margin at Le Mans in '76. (BELOW) The 936s were dusted off for 1981 and rattled off a third win...

IT LOOKS, WALKS AND QUACKS LIKE A 936...

...yet wily Reinhold Joest's 1980 Le Mans runner-up was called a 908/80.

But that was just semantics based on Porsche's decision not to sell any 936s to privateers.

Instead, Joest was given unraced 936 chassis No. 004, a supply of factory engines, Jacky Ickx as his co-driver...and go knock yourself out, Reinhold.

With rain falling, the "936 that wasn't" (BELOW) started the race in circumspect fashion, but Joest himself easily led by the three-hour mark as the rain abated.

Joest handed over to Ickx, but a broken fuel injection pump belt forced them into catchup mode as one of the locally-built Rondeaus took over the lead.

The 908/80 did retake the lead, but lost it again with gearbox problems. A second fightback was thwarted when the rain returned in the final hour...

taken at what he describes as a "remarkable meeting" late in 1975, the year before a new structure of FIA classes came into force. The World Championship for Makes would be fought out by Group 5 GT machinery, but there would also be a separate World Sportscar Championship for Group 6 prototypes. The two categories would, of course, come together at the non-championship 24 Hours of Le Mans.

"Out of the blue, Dr Fuhrmann asked us about the new Group 6 rules for 1976," recalls Singer. "He said, 'You're always saying that you have a lot of 917 parts in stock – suspension and gearboxes. We have the engine [from the 935], so all we have to build is a new chassis frame and bodywork.'"

Jantke argues that the 936 was "definitely not a Fuhrmann project." He claims that the car was Bott's baby.

"If you had to pick one person as the architect of the 936 program, it was Bott," says Jantke. "It was quite an emotional thing for him. He loved prototypes and he considered only a mid-engined machine to be a real racecar."

The debate over whose idea the car was will probably never reach a conclusion, given that Fuhrmann and Bott have passed away, but what is clear is that there was resistance within Porsche Motorsport to a prototype program at a time when it was at full stretch developing the 935. Singer states in his autobiography, *24:16*, that even Bott was against the idea: "We simply did not have enough people to develop a Group 6 car while we were preparing the 935 for the main world championship. We hadn't even studied the regulations in any detail."

Singer recalls Fuhrmann being insistent, which is why a car was testing at Paul Ricard in February. But it wasn't assembled after a trip to the parts department, says Jantke, even if the five-speed gearbox was borrowed from its prototype predecessor and the single-turbo flat-six from its Group 5 sibling.

"You might think it used parts from the 917," he says. "Parts no; ideas yes. When we were designing this car, no one was looking at redefining the future. We were just looking at solutions that worked."

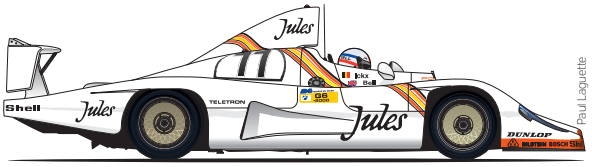
For that reason, says Jantke, the 936 wasn't the most advanced prototype on the grid at any time during its life.

BEAT THE LOCALS, BEAT YOURSELVES...

(BELOW) Renault was the 936's fierce competitor in 1976-'78, winning at its third attempt. (BOTTOM) A year later, Porsche beat itself in an ill-prepared '79 effort.

THE SWEET SMELL OF SUCCESS

Backed by Christian Dior's Jules cologne, the 1981 Le Mans-winning 936/81 was still one of the original three chassis built in '76, but now with a twin-turbo, 2.65-liter, Indy car-based flat-six (up from the single-turbo, 2.1-liter, 935-based unit of the original).



Paul Laguette

A ROOF OVER ITS HEAD

With Porsche not selling its 956 to customers until 1983, Joest Racing turned its 936 replica into a coupe, the 936C (BELOW), for the inaugural year of Group C in '82.

WE'LL TAKE IT FROM HERE...

Its Indy car-based engine thoroughly proven by the Porsche 936 in 1981, the legendary 956 Group C car made its race debut at the '82 Silverstone 1,000km.

JACKY ICKX IN FORMULA 1

The Belgian is now best remembered for his six Le Mans wins (second only to Tom Kristensen's nine), but his F1 career includes eight GP wins (six for Ferrari; two for Brabham) and two championship runner-up finishes.

"The 936 was certainly not the ultimate racecar of its time," he says. "It was a good solid racing machine; a compromise built on a low budget. It wasn't the fastest, but it was the best built and the most reliable."

The Renault-Alpine A442, which the 936 went up against in 1976-'78, was always the quicker car, Jantke admits, but it would only prevail against the German machine in the last of those years.

"They had the bigger budget and a modern engine; it was the faster car," he says. "If someone announced they had more power, we'd say, 'Let's see if it goes the distance.' We knew our car could race for 24 hours at a pretty good speed."

Renault's toe-in-the-water campaign in '76 yielded pole position, but its solo entry was out of the race early. The best of the Porsches, driven by Jacky Ickx and Gijs van Lennep, would win by 11 laps, and then only after it had lost five laps to exhaust repairs late in the race.

"If someone announced that they had more power, we'd say, 'Let's see if it goes the distance'"

MANFRED JANTKE

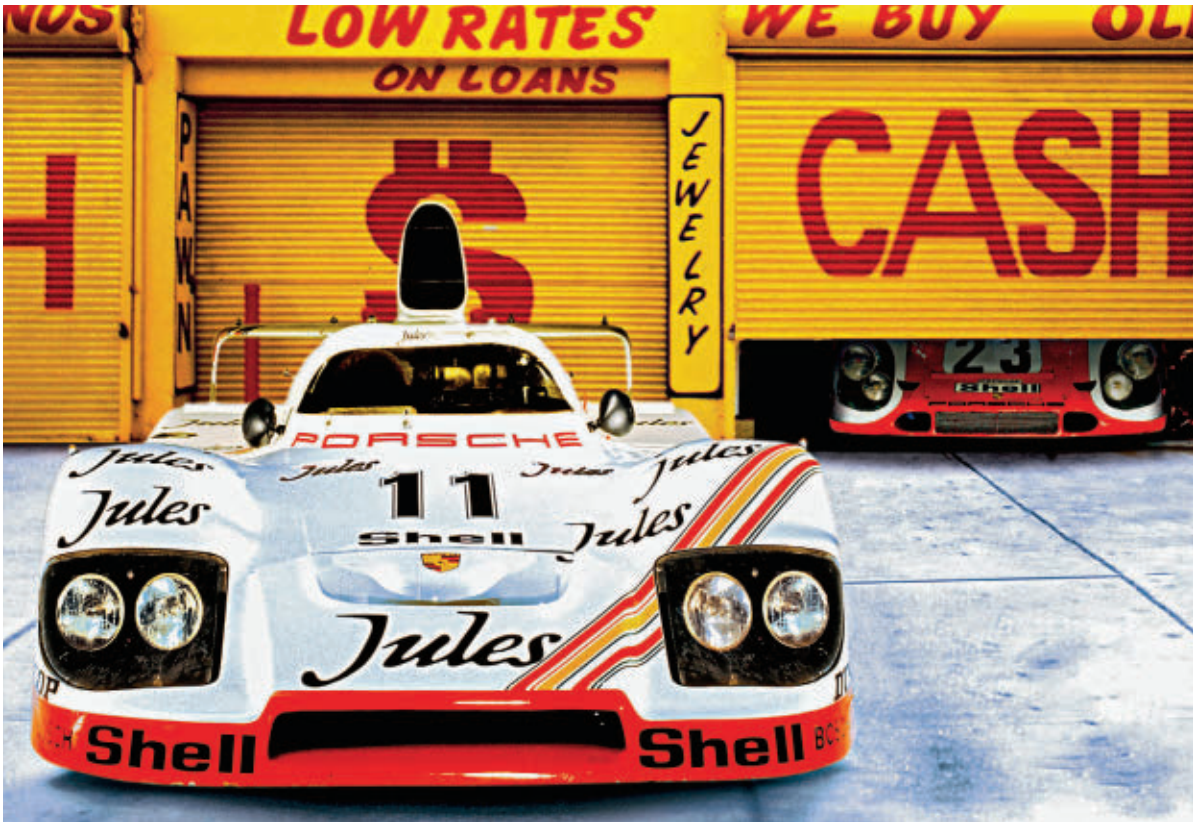
Le Mans '77 was a different story, however. Renault now had three full factory cars, as well as a semi-works car, and just three hours into the race looked a certainty for victory against two revised 936s. The fastest of the 936/77s, updated with a twin-turbo engine and revised long-tail bodywork, was out of the race and the second had lost 28 minutes while a fuel injection pump was changed.

Ickx, whose original car had retired after an over-rev from teammate Henri Pescarolo, swapped over to the delayed car shared by Hurley Haywood and Jurgen Barth. The defining drive of the Belgian's illustrious sports car career was about to begin.

A first stint of nearly three hours from the mercurial Ickx yielded a new lap record and a place in the top six. He was back in the car 90 minutes later for another double stint, which took the 936 to third. The gap to the leading Renault was still six laps, but significantly the French marque had suffered a first engine failure.

"As we put them under more pressure, they started to go faster and faster," recalls Barth. "Then they broke down one by one and we moved into the lead."

There was still a final twist in the tale. The 936 lost a cylinder in the final hour, but with all four Renaults out of the race and the second-placed Mirage so far back, the Porsche team was able to blank off the offending cylinder. Barth would make it two >



INFORMED BY 917

The Porsche 936 made use of the five-speed gearbox and some suspension components from the 917, and its spyder body took cues from the 917/30 Can-Am monster. But the three-time Le Mans winner proved way more than a stop-gap "917 Lite."

more times around the Circuit de la Sarthe to take the win with 11 laps in hand.

There was to be no Le Mans three-peat for the 936 against the might of Renault, even though Porsche responded to the challenge for '78 and entered all three 936 chassis, two powered by revised engines with water-cooled cylinder heads. Ickx claimed a first Le Mans pole for the 936, but none of the cars led a single lap and all would hit problems in the race.

Porsche had no plans to take the 936 to Le Mans in '79, focusing on its proposed move into Indy car racing as an engine supplier with Ted Field's Interscope squad. That was until David Thieme, maverick boss of future Team Lotus sponsor Essex Petroleum, decided he wanted to sponsor Porsche. Even though the decision to enter wasn't made until April, it should have been a cakewalk against a motley selection of prototypes. Instead, both cars went out, one with engine problems and one when Ickx was disqualified for outside assistance.

The 936 might have won again in 1980, although the factory-built chassis that carried chassis plate No. 004 was actually listed as a 908/80. Long-time Porsche entrant Reinhold Joest, not for the last time, used his connections to get hold of a car that some sections of the company didn't want to see racing.

Fuhrmann wanted to swap Joest's well-used 908/3 (actually the *1970* Targa Florio winner) for a 935. "I was not interested, so I spoke with Mr. Bott, who liked prototypes," says Joest. "We came up with the idea to build a chassis which we called a new 908/3, but in reality it was 100 percent 936."

"We knew the engine was reliable, because in Indy car racing you had to run a long time at full throttle"

NORBERT SINGER

Joest also got Ickx and looked on course for victory even after a change of injector belt on Saturday night – until fifth gear broke. Yet that still wasn't the end of the 936's Le Mans career. Porsche had a new boss in American Peter Schutz, who would ask the same question as his predecessor more than five years before.

Porsche, keen to find a successor to the rear-engined 911, had plans to race a 924 Carrera GT at Le Mans in 1981. Schutz wanted to know if it could win overall. "We had to tell him no," recalls Singer, "so he asked, 'What can we do to win overall?' The only thing we had was the 936."

That's not quite true. Porsche also had the stillborn 2.65-liter Indy car engine destined for Interscope, as well as a helping hand from the rule makers with the opening up of the capacity limit.

"We knew the engine was reliable, because in Indy car racing you had to run a long time at full throttle," continues Singer. "All we had to do was convert it back from methanol to gasoline."

The re-engined 936 took victory number three at Le Mans with Ickx and Derek Bell in '81. The Briton's return to Porsche would reinvigorate his career, yield three more Le Mans victories and help make his name on both sides of the Atlantic.

But the 936 wasn't quite done yet. Joest built a long-wheelbase coupe version, the 936C, for 1982 that would continue to race until 1986. Kremer Racing, meanwhile, would construct a facsimile of the 936 for use in the German DRM series.

The 936's legacy, however, would continue for much, much longer. Porsche, safe in the knowledge it had a suitable engine for the upcoming Group C formula, signed off the soon-to-be-legendary 956 just seven weeks after Ickx and Bell took Le Mans victory number three for the 936. ■

(LEFT) Jubilation as the 1976 Le Mans-winning Porsche 936 makes its way to parc ferme. (ABOVE) Its sister car didn't fare as well, retiring with engine problems on the Sunday morning.

WEISSACH'S OTHER VICTORIES

FOUR MORE PORSCHES; FIVE MORE WINS

Porsche's 17 Le Mans wins have come from a wide variety of cars. Here are some of the less celebrated ones.

Aside from two wins for the 917, three for the 936, six for the 956/962C and, in 2015, victory for the 919 Hybrid, four other Porsches have delivered five Le Mans wins.

• 1979 Porsche 935K3

Kremer Racing took the factory 935 and improved upon it to create the most successful iteration of Porsche's Group 5 GT racer in the K3. Kremer claimed victory at Le Mans in '79 against a small field of prototypes, two 936s included, but only after its K3, shared by Klaus Ludwig and Don and Bill Whittington, spent the better part of an hour parked on the Mulsanne Straight. The fuel injector belt had broken and, worse still, Don Whittington had damaged the spare carried in the car trying to fit it. That meant having to improvise a repair using an alternator belt to get the car back to the pits.

• 1994 Dauer 962LM Porsche

The seeds of Porsche's first Le Mans victory since 1987 were sown by misinformation. R&D boss Horst Marchart erroneously believed that McLaren was going to bring a race version of its F1 supercar to the 24 Hours in '94 and wasn't convinced that an improved version of its parts-bin special 911 Turbo S LM could beat it to GT1 class honors. Porsche Motorsport's response was to turn to the Porsche 962-based road car Jochen Dauer had built. The result was the Dauer 962LM Porsche and another outright Le Mans victory, thanks to Yannick Dalmas, Hurley Haywood and Mauro Baldi.

1979 PORSCHE 935 K3

Losing weight from the 935 was the Kremer brothers' goal. Tweaks included an air-to-air intercooler and composite body panels.

1994 DAUER 962LM PORSCHE

A luggage space, a flat bottom, and a couple other mods, and Porsche's 962 was now a street-legal racer. Don't you love loopholes?

• 1996-'97 Porsche WSC95

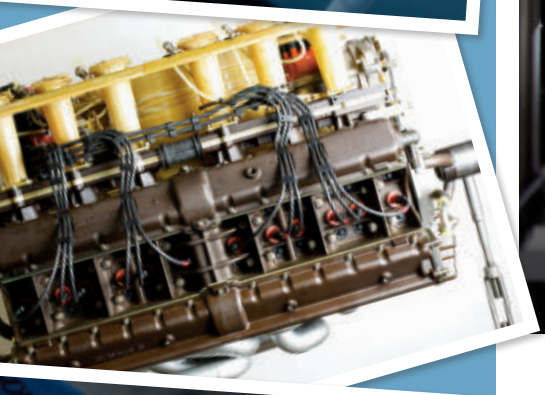
Porsche hedged its bets for Le Mans '96. Reinhold Joest had persuaded Marchart that the unraced WSC95 was still a potential winner and could provide back-up to its fleet of 911 GT1s, so Norbert Singer tweaked the aero and two cars were entered on a semi-factory basis. Reliability was the key to victory for Davy Jones, Alex Wurz and Manuel Reuter over a pair of GT1s. A year later the two improved GT1 Evos retired, so it proved prudent that Joest defied the factory to run the WSC95 (which he'd been allowed to keep for winning in '96) for Tom Kristensen, Michele Alboreto and Stefan Johansson.

• 1998 Porsche 911 GT1-98

The bitza special 911 GT1 was replaced for '98 by the first carbon chassis racer to be designed by Porsche. The 911 GT1-98 was being trounced on a regular basis in the FIA GT Championship by Mercedes, but was in the mix at Le Mans. The car wasn't as fast as Toyota's ultra-extreme GT-One, but it was more or less reliable. That combined with a little bit of luck – finger trouble did for the best-placed of the Japanese cars – allowed Porsche to take a one-two led by Allan McNish, Stephane Ortelli and Laurent Aiello.

As faster machinery from Toyota and Mercedes-Benz wilted, Porsche reliability gave the 911 GT1-98 the edge at the 1998 24 Hours of Le Mans. The resulting 1-2 was Porsche's last overall win until this year.

LAT



The painstaking work of restoring the Porsche 917K to the condition and specification it raced in at the 1971 Spa 1,000km began with extensive research.

SPA TREATMENT

When Porsche wanted the 1971 Spa 1,000km-winning 917K restored, the honor went to California-based PMNA.

WORDS George Tamayo | MAIN IMAGE Jeff Zwart

Restoring a Porsche icon – no, make that a motorsport legend – isn't a trivial thing. The Porsche 917 is a racecar that defined an era, a genre, and some say it's even a *bona fide* movie star.

So when the Porsche Museum in Stuttgart-Zuffenhausen, Germany, decided it was time to restore the No. 21 J.W. Automotive Engineering Gulf Porsche 917K back to its glorious Spa 1,000km-winning specification of 1971, the honor and privilege fell to Porsche Motorsport North America's (PMNA) Historic Motorsport division in Santa Ana, Calif.

According to Klaus Bischof, employee of Porsche Historic Motorsport and a member of the Porsche race team when the car was in action, this 917K is one of the most original examples remaining. (See *RACER*, August 2014, for more on the car's history and epic win at Spa.)

"In reality, every 917 is important for Porsche, but this one has a spectacular legacy," says Bischof. "It has always been owned by Porsche AG, having been loaned to John Wyer's Gulf team. Since winning the Spa 1,000km, it has always stayed in its original technical condition."

Restoring a production car to original spec is a definitive exercise, since all car models in a given year are the same. Racecars on the other hand often differ from race to race, and from others of the same type number. Bodywork, ride heights, and gear ratios, to name a few, are optimized for each race, which means that a true baseline is impossible to pinpoint.

Forty years later, tracking down the specific details is a formidable undertaking. So an essential first component of a

KNOWLEDGE BANK

Former PMNA president Alwin Springer assists PMNA Historic Motorsport's engine experts in reassembling the 917K's flat-12. It's an example of the in-house expertise, past and present, that Porsche is able to draw on.

(MAIN) Replicating the luster of the lacquer finish on the iconic Gulf livery is an example of the attention to detail that defines PMNA's restoration of the 1971 Spa 1,000km-winning Porsche 917K.

LAT archive

SPA 1971: RODRIGUEZ SETS THE PACE

The 154.77mph average speed of the winning Porsche 917K in the 1971 Spa 1,000km is a sports car racing record that still holds to this day.

Now restored by PMNA, the J.W. Automotive entry that achieved the feat (ABOVE) was driven by Jackie Oliver and a truly inspired Pedro Rodriguez (BELOW, on the podium with teammates and runners-up Jo Siffert and Derek Bell).

Read more in the August 2014 issue of *RACER*.

LAT archive

PMNA Historic restoration is deciding with the client to which spec (usually based on a specific race) the car will be restored in order to establish a clear goal and eliminate any ambiguity as to what constitutes original or authentic.

The Spa-winning spec was a straightforward choice, leading the team at PMNA to start the process by examining hundreds of photos of the car from both the race at Spa and other races it competed in to help confirm the details. The archives at Porsche Motorsport in Weissach provided another treasure-filled resource of first-hand information directly from the era.

And then there's the priceless knowledge contained in the recollections of people who were hands-on with the car in 1971. This is where Porsche has a relative advantage. From employees like Bischof, to links with former J.W. Automotive Engineering chief engineer John Horsman, PMNA's connections to those with the most intimate knowledge of the cars it restores couldn't get any more authentic.

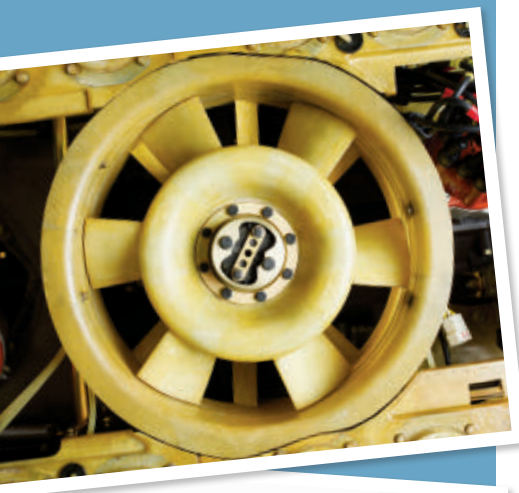
"It was clear that PMNA was taking extra effort to uncover the specific details of how we ran the car"

JOHN HORSMAN

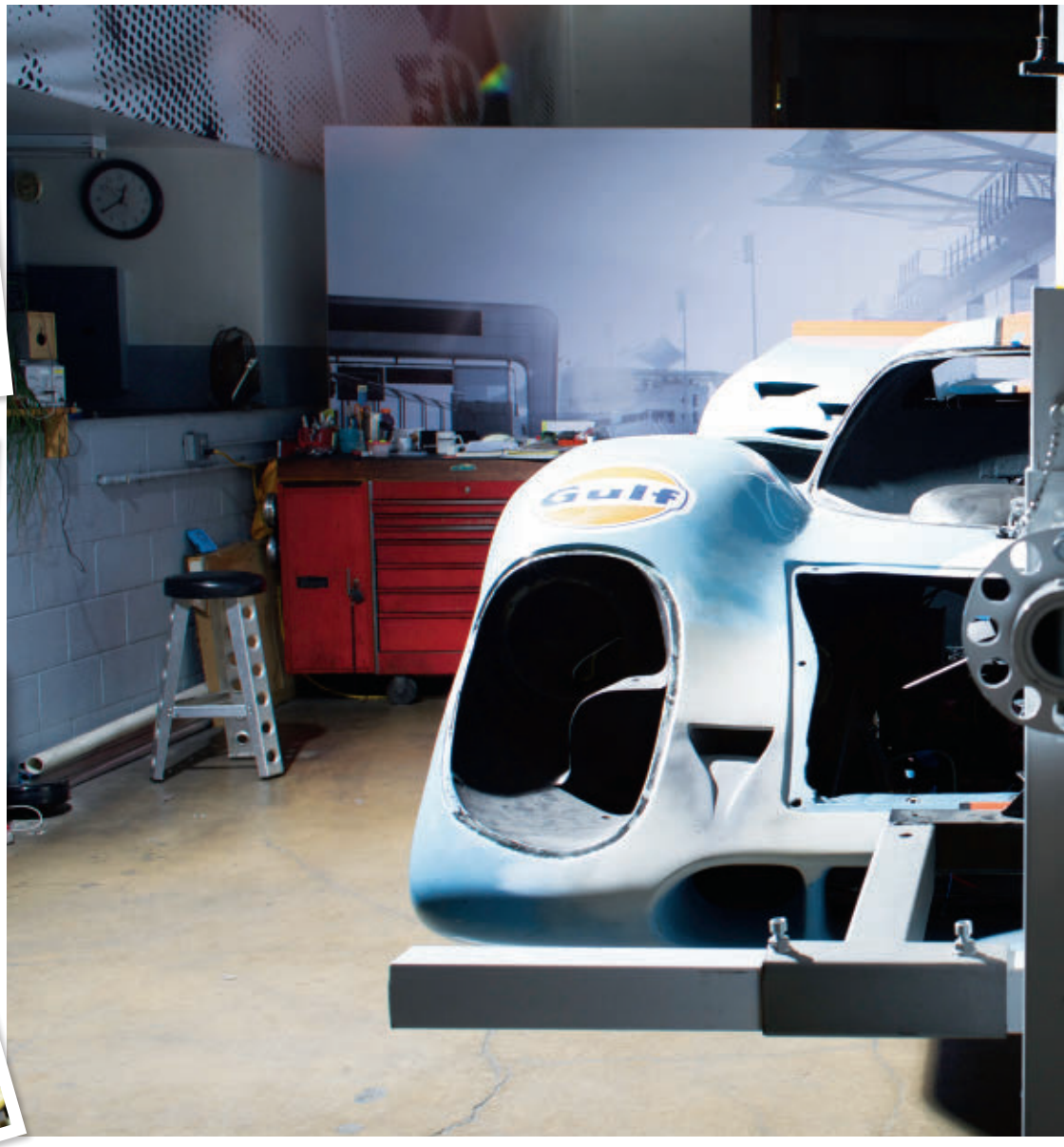
"I was thrilled to be contacted about the restoration," says Horsman. "I enjoyed recounting fond memories of developing these cars, and it was clear that PMNA was taking extra effort to uncover the specific details of how we ran the car in the day."

In a word, authenticity is what the PMNA Historic Division strives for. Whether it's referring to original Porsche schematics, or using factory-original tools and techniques, every effort is made to restore and preserve the car in the same manner as when it was built in Zuffenhausen.

For the 917K project, repairs to the chassis and refinishing of magnesium components were both performed using the same techniques as back in the day. The magnesium work was particularly challenging, since few people remain who are skilled in such a task. But such a person was found and the result is fully in keeping with how the parts were produced originally. It's just one example of the lengths to which PMNA Historic Motorsport is willing to stretch beyond its internal resources to bring an amazing network of expertise to >



The end goal of PMNA's restoration wasn't just to make the 917K look authentic, but to keep it in running condition, too. Ensuring that the car is safe to drive is also key.



each restoration project. In the end, being faithful to the car is what matters most.

The bodywork restoration involved repairing and repainting to replicate the configuration and livery from Spa '71. The work included fabricating from scratch the rear aerofoil developed by J.W.A.E. to keep the 917K's tail more planted. The process included studying images taken from a variety of angles and period documents to make sure that the wing angle was just right. Additionally, there was a large effort to replicate the luster of lacquer, ensuring the car appears period correct despite having to use contemporary paint.

In other instances, the question of restoration or preservation is more persnickety. As PMNA President and CEO Jens Walther states, the mission of restoring a Porsche racecar is to keep it where it belongs, namely on the racetrack, or at the very least in a state where it can be run. This can often lead to questions surrounding safety, which for the car's owner must be foremost, and utility.

The utility challenge presented itself with the engine, perhaps the most complex part of the 917K and the restoration as a whole. Drivetrains are a particular specialty of PMNA, for both current and past racecars.

According to PMNA vintage engine specialist Eric Bloss, "Rebuilding an engine of this complexity, when new parts aren't readily available, is a huge challenge. Through our partners in the industry, we were able to source what we needed and, in the end, it was very rewarding to bring the heart of the car back to life."

In prepping the wholly rebuilt engine,

ORIGINAL SKILLS

Restoration of the Porsche 917K's spaceframe chassis was carried out using techniques contemporary with its original build.

(MAIN) Restoring the 917K's bodywork to Spa '71 spec included careful reconstruction of ducting that had been modified to provide extra cooling at that year's Six Hours of Watkins Glen.

the team refined the assembly details to exacting measures, such as adjusting the complex fan drive system and tuning the 24-plug ignition system for the demands of how it will run in the future, rather than how it was raced in the past.

The collective effort made by PMNA Historic Motorsport raised a smile from Alexander Klein, director of the Porsche Museum, who will take over as the car's custodian when it arrives in Stuttgart-Zuffenhausen later in 2015.

"The Porsche 917-015 is a unique exhibit for the Porsche Museum," says Klein. "It achieved major successes at many long distance races around the globe, including the Spa win. PMNA restored it with the utmost emphasis on maintaining the highest level of originality. Starting in the latter part of 2015, the racecar will continue to be actively used by the Porsche Museum and will be participating in many international historic motorsport events."

"Rebuilding an engine of this complexity, when new parts aren't readily available, is a huge challenge"

ERIC BLOSS

With the 917K set to return "home," it leaves behind a group of people at PMNA, along with their partners, who are proud of their role in restoring a car of this magnitude to its former glory. When the engine ran once again for the first time, everyone at PMNA gathered and, through its magnificent bark, the sound of Spa in 1971 rang in their ears. ■

PORSCHE RS SPYDER

NEXT ON THE LIST...

Restoring the No. 21 Gulf Porsche 917K represents a significant moment in the development of PMNA's Historic Motorsport service. It is a measure of capability, as well as trust, that even the most demanding client in the Porsche Museum placed the job at their doorstep.

Next, PMNA turns its attention to a Penske Racing Porsche RS Spyder driven by Sascha Maassen and Lucas Luhr in the 2006 American Le Mans Series' LMP2 class that is technically and mechanically a polar opposite of the 917K. Yet, the 3.4-liter V8-powered, carbon fiber chassis RS Spyder is just as essential to telling the story of Porsche's racing heritage, and will be another remarkable showpiece for demonstrating the capabilities and quest for authenticity of the PMNA Historic Motorsport team.

While the work will be vastly different from the 917K, the level of detail put into the restoration project will be just as immersive.

"I'm proud of our team of technicians from Weissach and Santa Ana, the colleagues from the Porsche Museum and our partners to restore this important piece of Porsche's history," says Jens Walther, PMNA president and CEO. "Throughout the process we have focused on authenticity and originality, while making sure that the car is safe to drive. This service is also available to our customers who would like to have their own Porsche racecar restored by PMNA."

Richard Dole/LAT

Next, PMNA Historic Motorsport turns its attention to a Porsche RS Spyder as raced in the 2006 ALMS (ABOVE).

LAND OF THE GIANTS

Mention the acronym "GTP" to anyone who witnessed the wild creations that ran amok in the International Motor Sport Association's premier class from 1981 to '93 and you're all but guaranteed to hear some amazing tales about North America's defining sports car class.

Grand Touring Prototype cars were the perfect fit for a party-filled decade where excess was a way of life. IMSA's GTP rulebook was more of a suggestion than an iron-clad agreement, and from that deep well of opportunity, demonic power, astronomical speed, incredible looks and heavenly sounds were conjured.

IMSA's thunderous show was the envy of the ACO and FIA, struggling to make Group C a global phenomenon. During its richest period, GTP produced some truly great cars, along with concepts ranging from ingenious to idiotic, and it remains a benchmark for spectacle and variety even today.

Here then are some of the giants of the GTP era – cars we are proud to say called America home.

WORDS Marshall Pruett
MAIN IMAGE Jeff Zwart

1 PORSCHE 962 – 1984-'93
IMSA'S SWISS ARMY KNIFE...

Without Porsche's turnkey prototype, GTP would be remembered as a failed experiment. Introduced at the 1984 Daytona 24 Hours, it was the first purpose-built factory car for the GTP class – an IMSA-compatible version of Porsche's 956, to all intents and purposes – and went on to fan the flames that sparked IMSA's rising popularity.

The 962's brilliance was in its utilitarian design. It was never the most powerful or best handling car, but it also didn't possess any show-stopping weaknesses. It was the best "sum of the parts" GTP car for four glorious seasons, could still scramble to a race win as late as 1993, and continues to stand as the ultimate Pro-Am prototype.

In the legendary hands of a Derek Bell, Al Holbert, Jochen Mass, Hans Stuck or Bob Wollek, the 962's pace was an absolute killer. And in another Porsche hallmark, its drivers could hammer away near the limit while other marques were often constrained by reliability concerns.

Piloted by privateers like Bob Akin, Jim Busby, Bruce Leven, and countless others who cast the mold for today's Pro-Am drivers, the 962's flat-six turbo engine, methodical, forgiving gearbox, and ample downforce delivered a driving experience that didn't twitch or bite, but instead flattered its users with easy to find speed.

The 962 served all purposes, but if there's one aspect of its vast legacy that has been somewhat overlooked, it's the car's alarming overall pace. Holbert Racing found the 962's sweet spot halfway through 1984 and went on to claim five wins from the final nine races.

With Holbert's mighty No. 14 leading the development charge for '85 – and Porsche's customer base exploding during the preceding offseason – the 962 authored the most dominant GTP season on record, when five teams contributed to an unprecedented figure of 16 wins from 17 races.

Holbert Racing repeated in 1986, as 962 teams took 12 of 17 races and stuffed the sharp end of the championship with eight drivers in the top nine in points. Holbert Racing's title three-peat was completed in '87, when the 962 fleet snared 13 wins from 116.

During the 962's three-year GTP title run in 1985-'87, seemingly impossible win rates of 94, 70 and 81 percent were recorded. Those figures stand as a testament to the car's base design, and the ability of teams to apply an endless

A 24-HOUR QUINTET
Iterations of the 962 won five times at the Daytona 24 Hours. Busby Racing took win No. 4 in 1989 (ABOVE), with John Andretti, Derek Bell and Bob Wollek.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(FAR LEFT) The Porsche 962 became a canvas for teams to add their own aero tweaks. (LEFT) IMSA rules required the 962 to run with a single turbo, instead of the 956's twin layout.

supply of chassis, engine and aero evolutions to their respective 962s.

Engines from 2.8 to 3.2 liters were tried. Air- and water-cooled powerplants were raced. Single- and twin-turbos, along with single- and twin-spark ignition systems, were fitted. 962 monocoques were made from assorted materials by the factory, and by independent builders from California to Georgia. Front wings came and went. A series of scoops, vents and dive planes were tried. Short- and long-tails were raced, along with revised underwings and tunnels. Some teams designed and built all-new bodies on their own.

It was hard to find two 962s in the same configuration, yet most won races, or at least landed on the podium.

The 962 was IMSA's Swiss Army Knife. It also filled at least half the GTP grid during its reign as *the* go-to customer prototype, and only lost its position when big factories threw hundreds of people and untold millions at purebred challengers.

Porsche's groundbreaking *neun sechs zwe* was produced specifically for IMSA's GTP series; in return, the iconic machine went on to make the GTP series. >

STIFFENING RESOLVE

If the factory-built 962 had a weakness of any kind, it was a lack of stiffness in its aluminum monocoque. Holbert Racing led the way in building its own chassis, the 962-HR1, but relied on the less-modified 962-103 (MAIN) to take on the big enduros. Indeed, 103 became the only car to win back-to-back Daytona 24 Hours (1986 and '87).

Illustrations Paul Laguette

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2 NISSAN GTP ZX-TURBO - 1988-'90
ELVIS IS IN THE BUILDING

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(LEFT) Nissan's ZX-Turbo changed the game in the GTP class. Geoff Brabham (ABOVE) won two GTP titles with the ZX-T, and a third with a combination of this car and its successor, the Nissan NPT-90.

With the 962 luring numerous manufacturers to IMSA, the narrative built by dueling Porsches, BMWs, Buicks, Corvettes, Fords and Jaguars through 1987 brought GTP into the national consciousness. But it was Nissan's thrilling ZX-T in the flowing hands of Australia's Geoff Brabham that gave America its first national GTP storyline to follow.

Nissan joined the GTP party in 1985 as a bit-player, and through '87 its most notable attribute was poor reliability. The Nissan was the wrong kind of fast and fragile, as unholy power from Electramotive's 3-liter, single-turbo V6 stressed out its internals, and out-grunted its Bridgestone-shod Lola chassis. Something had to change for '88.

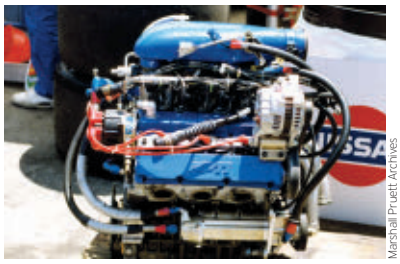
With Electramotive moving car build in-house to its Southern California base, company founder Don Devendorf and his team started with Porsche's "best sum" 962 formula and removed all compromises. Improved stiffness and downforce, revised suspension, and the final change – a switch from rock hard Bridgestones to supple Goodyears – transformed Brabham's ZX-T into GTP's angel of destruction.

With just one full-time entry in '88, Nissan spotted the field a sizable advantage by skipping the two big enduros at Daytona and Sebring. With a sizeable hole to dig out of, Brabham began an epic comeback with a win at Round 4 in Road Atlanta – then *seven* more in succession. Fans from every corner of the sport began following the red, white and blue No. 83 ZX-T to see if (or when) Brabham's streak would end. And thanks to a chassis nicknamed "Elvis," IMSA's first star was born.

That eight race victory streak would be a new record for consecutive wins by the same car and driver, and the ZX-T took one more win before it was finished trashing 1988. Nine rampaging wins, eight poles, and 10 fastest laps from 12 events were left in its wake. Despite zero points from Daytona and Sebring, Brabham took his first GTP title with ease.

Electramotive repeated the feat in 1989 as the ZX-T went 10-for-15, and by '90 – arguably the peak of competitiveness in GTP – the ageing design managed four more wins, including the 12 Hours of Sebring. Along with three wins contributed by its midseason replacement, the NPT-90, Nissan secured its third consecutive championship.

Through 1987, GTP was known for its variety of winning cars and teams, but that was forever changed by the '88 ZX-T. It made Porsche's 962 obsolete almost overnight and ushered in a new era where one car, one team, and one driver could decimate a class packed with factory GTPs. >



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POWER TO SPARE

Power was never a problem for Nissan's VG30-based, single-turbo, 3-liter V6. It put out 850hp in 1988-spec, and 750 in '89 with a smaller air restrictor diameter.

IN-HOUSE DEVELOPMENT

Nissan's first forays into GTP racing were with a Lola-designed car and Electramotive-built engine, but moving the design and build of the car to Electramotive for 1988 proved the masterstroke in turning the program into a serial winner. Yoshi Suzuka had already revamped the aero, but Trevor Harris' super-stiff monocoque and a switch to Goodyear rubber finally unlocked the ZX-Turbo's potential.

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5	May 30 / The Raceway at Belle Isle Park	
6	June 28 / Watkins Glen International	
7	July 12 / Canadian Tire Motorsport Park	
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10	August 23 / Virginia International Raceway	
11	September 19 / Circuit of The Americas	
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3

AAR EAGLE-TOYOTA MK III - 1991-'93

THE FASTEST OF THEM ALL

If the Porsche 962 was the best of the GTP era, and the Nissan GTP ZX-Turbo took the class to unfathomable heights, All American Racer's Toyota-powered Eagle Mk III will go down as the fastest GTP car ever unleashed.

Featuring the angriest 4-cylinder turbo in the series, a revolutionary aerodynamics treatment, staggering downforce, and surprising drivability, the Mk III achieved the impossible by mating gravity-defying performance with user-friendly handling. This Eagle lived on the ragged edge, but its drivers were rarely forced outside their comfort zones.

Unveiled at the tail end of 1991, the Mk III won two of the last four events and went into '92 as a promising contender in need of a worthy challenger.

Just how good was the Eagle Mk III? The world was about to find out.

Like a global grudge match brought to American shores, the '92 stage was set for Jaguar's fearsome XJR-14 to battle AAR's unproven Eagle for GTP supremacy. Fresh off a title-winning season of brutal success in the Euro-centric World Sports Prototype Championship, the stunning, Ross Brawn-penned XJR-14, nicknamed the "F1 car with fenders," was expected to mop the floor with the Mk III. And sure enough, the end result wasn't pretty...

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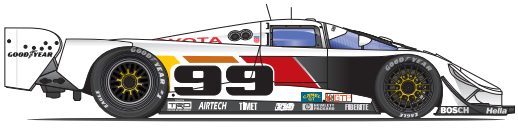
AERO TREND-SETTER

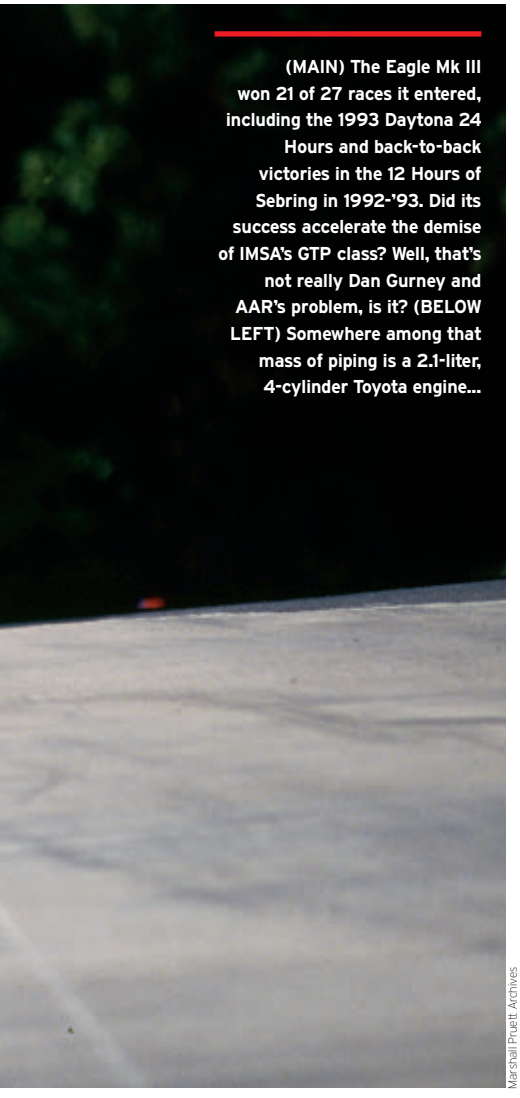
The previous Eagle GTP car, the Mk II, lacked front-end grip, so designer John Ward and aero wizard Hiro Fujimori came up with an integral nose diffuser for the Mk III, the fundamentals of which are still used in current prototype sports car designs. The Mk III's through-flow ducting for radiator cooling has informed the internal layout of Nissan's radical GT-R LM Nismo LMP1-H car.



AAR's nine wins from 15 races, including seven in a row, left Jaguar's all-conquering XJR-14 mauled, mangled, maddened and mystified. The Eagle Mk III's reign of terror was so complete that Jaguar tucked its tail between its legs and ran at the end of '92. Nissan, the defending GTP champion, tapped out after a demoralizing one-win season.

Fact is, AAR's Eagle Mk III might have been *too* good. Gurney & Co. were left to wage an internecine battle between Juan Fangio II and PJ Jones during GTP's 1993 swansong, and despite the lack of factory opposition, the Mk IIIs actually went faster. The Mk III won every race AAR entered in '93 – a clean 10 for 10 – and by the end of its run, the final Eagle prototype owned track records at 10 of the 11 venues on the schedule.

Numbers aside, Mk III's greatest legacy is how it earned those lap records. It was a freight train hidden within a ballerina's body. It connected straights, braking



(MAIN) The Eagle Mk III won 21 of 27 races it entered, including the 1993 Daytona 24 Hours and back-to-back victories in the 12 Hours of Sebring in 1992-'93. Did its success accelerate the demise of IMSA's GTP class? Well, that's not really Dan Gurney and AAR's problem, is it? (BELOW LEFT) Somewhere among that mass of piping is a 2.1-liter, 4-cylinder Toyota engine...

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NOT BORN FOR THE USA

The 3.5-liter, V8 Jaguar XJR-14 dominated Group C in 1991, but a switch to IMSA GTP proved a disappointment. The highly-strung car proved incompatible with U.S. tracks.

zones and turns into one fluid movement.

The Eagle's perpetual state of motion died along with the GTP class at the end of '93, but decades later, the Mk III's spirit has returned in a new generation of prototypes. Audi's R18, Porsche's 919 and Toyota's TS040 owe AAR a debt of gratitude for using a blueprint the Mk III established almost 25 years ago.

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4 JAGUAR XJR-9 - 1988-'89
CAT SCRATCH FEVER

Visceral memories of the XJR-9's trumpeting 7-liter V12 are indelible for those who heard the big cats growl and roar. Among IMSA's many unforgettable exhaust notes, V12-powered Jaguars from Group 44 and Tom Walkinshaw Racing provided its most glorious soundtrack. And with Nissan about to go on the warpath, fans were also given a colorful underdog (or undercat?) to support in TWR's XJR-9s.

As the first European factory to tackle GTP with a proper program, TWR put the series on notice when the Castrol-liveried No. 60 XJR-9 won on its debut at the 1988 Daytona 24 Hours. That season-opening triumph rocked the establishment, and thanks to the car's marvelous speed and sound, the XJR-9 became a fan favorite as the only hope to topple Nissan's GTP ZX-T juggernaut.

With the XJR-9, IMSA had a charismatic foil to pit against Nissan. While the GTP ZX-T devoured anything that got in its way, the fetching Jag had to stalk its prey in search of an upset.

Under Allan Scott's guidance, Jaguar's proven V12 engine was perfect for the long races, and as the top naturally-aspirated GTP car, the XJR-9's instant throttle response was a decided advantage against the slow-spooling turbos. Street circuits dominated IMSA's calendars in the late Eighties, and each visit gave the XJR-9 a chance – even if it was slim – to knock Nissan off its perch.

As the perfect bookend to Daytona, the XJR-9 closed 1988 with a win on the streets of Del Mar. In '89, it claimed the street race at Tampa and added a road course win at Portland, too. TWR's twin-turbo V6 XJR-10 chassis raced alongside the XJR-9 that season, and as untamed turbo power began to rule GTP, the V12's days were numbered.

But greatness is defined in many ways, and for the XJR-9 it was earned by bringing a dramatic tension to GTP's breakthrough seasons. Win or lose, the growling Jaguar made a massive impact for IMSA wherever it raced. >

Jaguar's XJR-9 made its IMSA GTP debut at the 1988 Daytona 24 Hours, finishing first with the No. 60 car and third with the 66. The third entry, (No. 61, ABOVE) retired with overheating issues.

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THE CAT'S GOT STYLE

The XJR-9's rear-wheel covers were a stylish addition that helped clean up rear-end airflow. Quick-release latches were used to open the flaps during pit stops.

CUBIC INCHES, BABY!

At the heart of the Tony Southgate-designed Jaguar XJR-9 was a naturally-aspirated, 7-liter, 60-degree V12 based on the 5.3-liter unit used in the XJS road car. With power output around 750hp, the engine was lightly stressed and extremely reliable, but its turbocharged opposition was nudging 900-1,000hp, forcing Jaguar to switch to forced induction, too.

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5 LOLA, MARCH, SPICE "KIT CARS" – 1981-'91 THE BRITISH INVASION

As tempting as it is to nominate a fifth GTP chassis for individual recognition, the broad range of customer and factory cars produced by Britain's March, Lola and Spice had a much greater collective impact.

Their role evolved as IMSA grew, but as early as 1981, the British kit car era was firmly underway as Lola's Chevrolet V8-powered T600 propelled Brian Redman to the Drivers' Championship with five wins and five seconds while the wonky (and slow) March-BMW M-1C gave chase.

The Porsche 935 majority learned there was a new route to victory lane, and with March churning out the 82G for '82, the "big V8 + lightweight prototype" formula caused GTP's numbers to grow.

IMSA had thrived on identifiable manufacturer names and body shapes since its formation, but small, independent constructors now held the key to winning the series' featured GTP class.

Privateer March teams seized consecutive titles with the Porsche turbo 83G in 1983 and '84's Chevy V8 84G,

VARIETY PACKS

British-built "kit cars" brought variety and bulk to IMSA's GTP class before the rise of the Porsche 962. (ABOVE) March and Lola set the ball rolling, with Spice (RIGHT) joining later.

Marshall Pruett Archives

and with Lola's reputation already established, auto manufacturers flocked to England in search of factory solutions.

BMW brought its F1-derived 4-cylinder turbo to March, and in an adjacent room, Buick dropped its turbo V6 bomb in another March. GM, in the guise of Corvette, had Lola fit its turbo V6 into a prototype, and Mazda hired Lola for its twin-rotor 13B.

Wins were rare, but, oh boy, some of those manufacturer-blessed March and Lola entries went like guided missiles. The BMW and Buick turbos were first to crack GTP's 1,000hp ceiling, and put on amazing, albeit short-lived, shows at most rounds.

Porsche's 962 drove business away from March and Lola, but Spice breathed life into the kit-car scene by building the best customer GTP Lights chassis and punching well above its weight with a fine line of V8-powered GTP cars.

Watching Perry McCarthy beat the factory Jags, Nissans, and Toyotas to pole at Sears Point in 1990 with an unheralded Spice-Pontiac was a glowing reminder of how, in the right conditions, British kit cars were still capable of humbling GTP's giants. ■

A LOBSTER TALE

Given the March 83G's "lobster claw" appearance, it was a stroke of genius by Kenper Miller and David Cowart to race their March 83G-Chevrolet in the colors of the Red Lobster restaurant chain. The plucky privateers took several podiums in the car during 1983 and '84, including five runner-up finishes.

GTP SPAWNS THE WEIRD AND WONDERFUL

The Allard GTP chassis looked and functioned like a prop from a bad sci-fi movie. Mazda's alien RX-792P sounded like it was powered by the voices of a thousand little girls screaming in unison. Ford's front-engined ◂ Mustang GTP was the grandfather of Nissan's ass-backwards GTR-LM NISMO.

Pick any season, and you're guaranteed to find at least one GTP car that was weird, wonderful, or both. With such a wide canvas to work from, GTP entrants and manufacturers wandered almost anywhere they chose, with adventurous bodywork, engine and chassis concepts. For example...

- Variants on the Porsche 935 Moby Dick theme are still a marvel to behold.
- With more than 8,000lbs of downforce, Bob Riley's Chevrolet Intrepid was as fast in the corners as it was on the straights.
- Just saying, but the early 1980s-spec Group 44 ◂ Jaguar XJR-5 might be the prettiest GTP car ever made.

- Jon Gunn's atrocious ◂ Phoenix chassis – a Home Depot project with wings – was the only GTP kit car for sale in the back of a magazine.

- The front-engine ◂ PAS-Pontiac was a POS that couldn't break 130mph.
- Jack Roush dropped a NASCAR-style Ford V8 into the Maxum chassis.
- Oh, and Herb Adams fitted a roof to his Can-Am catamaran for a series of ill-fated GTP outings.

In fact, although Adams' sidecar might have been the strangest entry IMSA has ever seen, it actually honored GTP's origins. The car credited as the first GTP entry – an open-top FIA Group 6 Chevron B36 chassis – appeared at Sebring in 1981 with a hopeless Alfa Romeo engine and a makeshift GTP half-roof ◂ formed by the rear glass from a late 1970s Corvette...

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JACK'S MUSTANG RETURN
Roush Racing switched back from Mercury Cougars to Ford Mustangs in 1991, winning the GTO class at the Daytona 24 Hours and the 12 Hours of Sebring. A pre-CART Robby Gordon missed out on the GTO Drivers' title by just four points.

WORDS Marshall Pruett
IMAGES Marshall Pruett Archives

GTO/GTU

WAY MORE THAN THE SUPPORT ACTS

Just as IMSA's GTP entrants had a ton of leeway to get crazy, so the GTO and GTU classes were given a mandate to push the envelope, too.

Forget production-based GT cars; IMSA's only concern for authenticity within its GTO and GTU ranks came in the bodywork department. Tubeframe silhouettes ruled both classes during the GTP days, and at the outermost extremes, big-bore factory GTO teams like Nissan and Ford pulled motors directly from their GTP programs.

"You have to remember that a lot of the GTO cars were almost as light as the GTPs, and we made pretty similar power a lot of the time – especially with some of the big V8s we had from Jack Roush," says two-time GTO champion Scott Pruett. "Plus, we didn't have those big wings or ground effects to slow us down. I used to love whistling by GTP guys at Daytona because I knew it pissed them off. The GTOs were crazy-fast."

Roush's V8-powered Mustangs took 13 wins in 1985 and eight more in '86, giving the iconic pony car total command of GTO before Ford shifted its marketing strategy to turbocharged 4-cylinder Merkur XR4Tis and Lincoln-Mercury Cougars.

Only AAR's sublime 4-cylinder turbo Toyota Celica's annexing of the 1987 GTO championship interrupted Roush's run to five titles through 1990. And in the wake of the Celica's success came a wave of models that relied on forced induction.

By 1989, most GTO cars had become

THE ULTIMATE CELICA
AAR's Celica Turbo GTO used Toyota's 2.1-liter, inline-4 engine. A partial season in '86 ironed out the kinks, leading to a dominant, Roush-beating '87 campaign.

YOUR DAILY DRIVER...

The cars might not have made headlines like the mighty machines of IMSA's GTP and GTO classes, but the GTU class was still a potent marketing platform for manufacturers wanting to add some buzz to their smaller-capacity models.

DODGE
Dodge's GTU participation with the Daytona culminated in a 1991 Drivers' title for John Fergus.

ONE AND DONE
Audi's all-wheel-drive 90 Quattro was a one-year wonder in IMSA GTO, but won seven races with Hans Stuck. Skipping the early-season enduros at Daytona and Sebring blunted his title hopes.

ZX POWER TRIP
Similar to the GTP class ZX-T, Clayton Cunningham Racing's mighty Nissan 300ZX GTO racers used a version of Nissan's VG30 V6, but with twin turbos. Power output reached as high as 800hp!

dragsters masquerading as road-racing machines. Bob Sharp Racing's divine selection of turbocharged, 6-cylinder Nissans predated Clayton Cunningham Racing's factory Nissan program. But in CCR's aggressive hands, a pair of GTP-inspired 300ZXs challenged Roush's twin Cougars for turbo superiority.

The Noah's Ark theme was completed by Audi and its duo of mesmerizing 90s. With Hans Stuck leading the German assault, the turbo, 5-cylinder, all-wheel-drive Audis owned the turns *and* the hearts of all those who heard the chirping, screaming cars in GTO trim.

It was a majestic time for the class. Break out a race today between the Audis, Fords, Nissans, Toyotas, plus Mazda's deafening 4-rotor Mazda RX-7s and Ferrari France's F40s, and we just might forget today's GT Le Mans class exists.

IMSA's small-bore class was the perfect place for cars in the sub-300hp range, and if there was one model that defined GTU, it was Mazda's pint-sized RX-7. Twin-rotor 13Bs buzzed away night and day and, like Porsche's 962, the RX-7 was almost a shoo-in at the enduros. Seven straight GTU titles put it in a class all of its own.

Nissan took the fight to its Japanese rival with the bulging 240SX and a silky, naturally-aspirated V6 that ended the RX-7s reign, and Mazda soon responded with the faster, squarish MX-6.

IMSA's entry-level class was the only place where fans could see outrageous versions of their daily drivers swap paint, and among the most interesting – and forgotten – GTU gems, Dodge's factory team freely flirted with front- and rear-wheel drive options.

Full Time Racing's Dodge Daytonas missed out on Manufacturers' titles, but claimed Drivers' honors in 1991 after its 4-banger won 75 percent of the races. Feisty 4-cylinder Pontiac Fieros brought another memorable dynamic to the class, and even AAR's baby Celicas cut their teeth in GTU before turbo fury beckoned. ■

NISSAN
The V6-powered 240SX signed off from GTU competition with a championship for Butch Leitzinger in 1993.

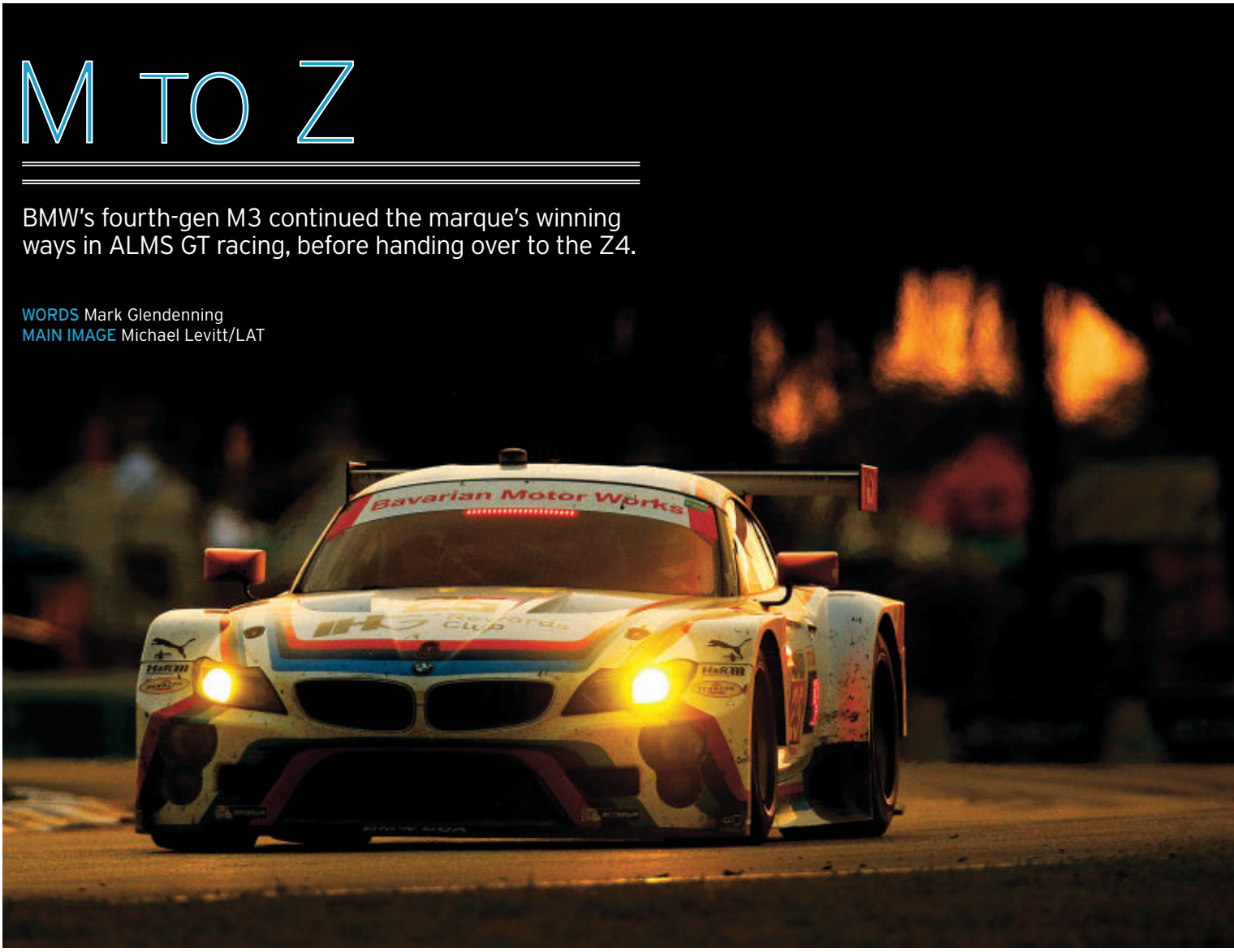
TOYOTA
Toyota entrusted its Celica GTU program to AAR in 1983, which delivered eight class wins in three seasons.

MAZDA
IMSA GTU's defining car, the rotary-engined RX-7, amassed seven straight titles between 1979 and '85.

M TO Z

BMW's fourth-gen M3 continued the marque's winning ways in ALMS GT racing, before handing over to the Z4.

WORDS Mark Glendenning
MAIN IMAGE Michael Levitt/LAT



The BMW M3 has one of the most storied histories in motorsports, so when the time came to prepare a fourth generation of the car for North American competition, it had to be capable of following in some big tire tracks.

The M3 Coupe that spearheaded BMW's return to the American Le Mans Series in the late 2000s with Rahal Letterman Racing (now RLL) proved entirely worthy.

"It was a very good car," recalls team principal Bobby Rahal. "As you'd expect from BMW Motorsport, it was really well done."

Although BMW was winding down its Formula 1 program, the fourth-generation M3 street car was able to take full advantage of the technology transfer, including an engine block cast in the same foundry as its grand prix counterparts. That DNA carried over to the M3 Coupe GT racer, which benefited from BMW's F1 computational fluid dynamics (CFD) and wind tunnel capabilities to optimize its aerodynamic performance.

The car's potential began to reveal itself over the balance of its 2009 debut season, including a class win at Road America and a podium at the grueling Petit Le Mans season-closer.

A GT Teams' and Manufacturers' Championship double in 2010 was followed a year later by a sweep of the Teams', Manufacturers' and Drivers' crowns for Joey Hand and Dirk Muller. A class 1-2 at the 12 Hours of Sebring, one of the world's toughest endurance races, was thrown in for good measure.

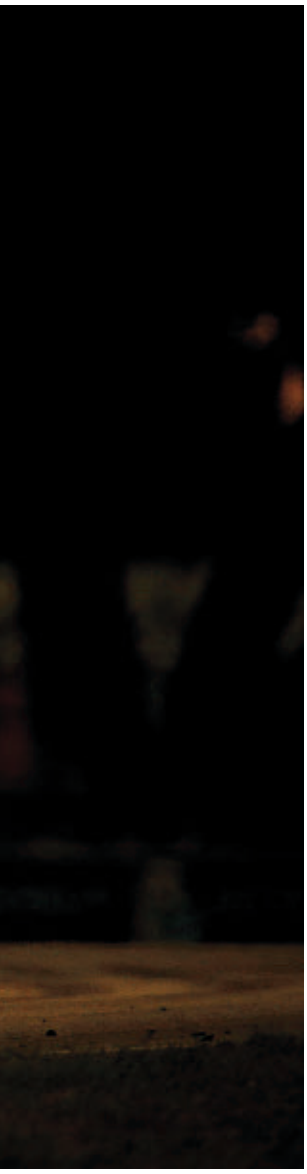
I WAS THERE... JOEY HAND


Drew Gibson/LAT

"That 2011 season and winning the GT Drivers' Championship was all about capitalizing on opportunities. In '09 and '10, the M3 Coupe was getting stronger and more reliable, and the team was already really good on strategy with Bobby Rahal and Scott Roembke, so it was just a matter of taking the car to its limits and doing the right things.

"We hit on all cylinders. Dirk Muller and I got along really well; we were a good combination of two different-style drivers. And we were both very consistent – we didn't make mistakes and got everything out of the car.

"It was a huge year that ended up changing my career path. That same year, BMW announced it was going to race in the DTM again, and after I had such a big season, they offered me a test, for fun. But it went really well, and I ended up becoming the first American to race in the DTM."



Drew Gibson/LAT

BMW E92 M3, 2009-'12

Powered by a 4-liter, naturally-aspirated V8 that gave around 460hp in air-restricted ALMS GT guise, the fourth-gen M3 took seven GT class wins in 38 starts, including a 1-2 at the 2011 Sebring 12 Hours.

BMW/John Townsend

FORMULA BMW USA, 2004-'07

Intended as a first step on the open-wheel racing ladder, FBMW USA provided valuable experience for the likes of IndyCar Series aces James Hinchcliffe and Graham Rahal and DTM racer Robert Wickens.

BMW Z4 GTE/ GTLM, 2013-'15

RLL's Z4s (ABOVE) were in the thick of the TUDOR Championship's GT LM title fight as *RACER* went to press. In 2014, Turner Motorsport won the series' GT Daytona class with its GT3-based Z4.

"Our expectations were exceeded, to be honest," Rahal says. "We thought it was going to take a little longer than it did to be truly competitive. But there were tracks that the car was good at right from the start, plus it had great reliability, and we had excellent drivers."

The arrival of the current GTE-spec Z4 for the start of 2013 was precipitated by a pause in production of the road-going M3. The Z4 roadster is a different animal to its predecessor, and required a correspondingly different approach in order to be honed for the race track.

"The Z4 presented different challenges for BMW and for us," says Rahal. "Very short wheel base, kind of draggy, especially in the beginning – there were a number of challenges that we very quickly got a grip on.

"In GT racing, you're always fighting with the BoP [Balance of Performance], too," he adds. "That's always the dance, and some days the dance is to your music, and some days it isn't."

The Z4's nimbleness and superior handling makes it a benchmark on the tighter, twistier tracks of the TUDOR United SportsCar Championship, but BMW's strong suits may change again with the arrival of the more slippery, longer-wheelbase M6 which is currently being developed as its GT weapon of choice for next year.

Meanwhile, BMW and RLL are in the throes of a close and exciting battle for 2015 TUDOR Championship GT Le Mans class honors as they seek to give the Z4 a send-off appropriate to its heritage. ■

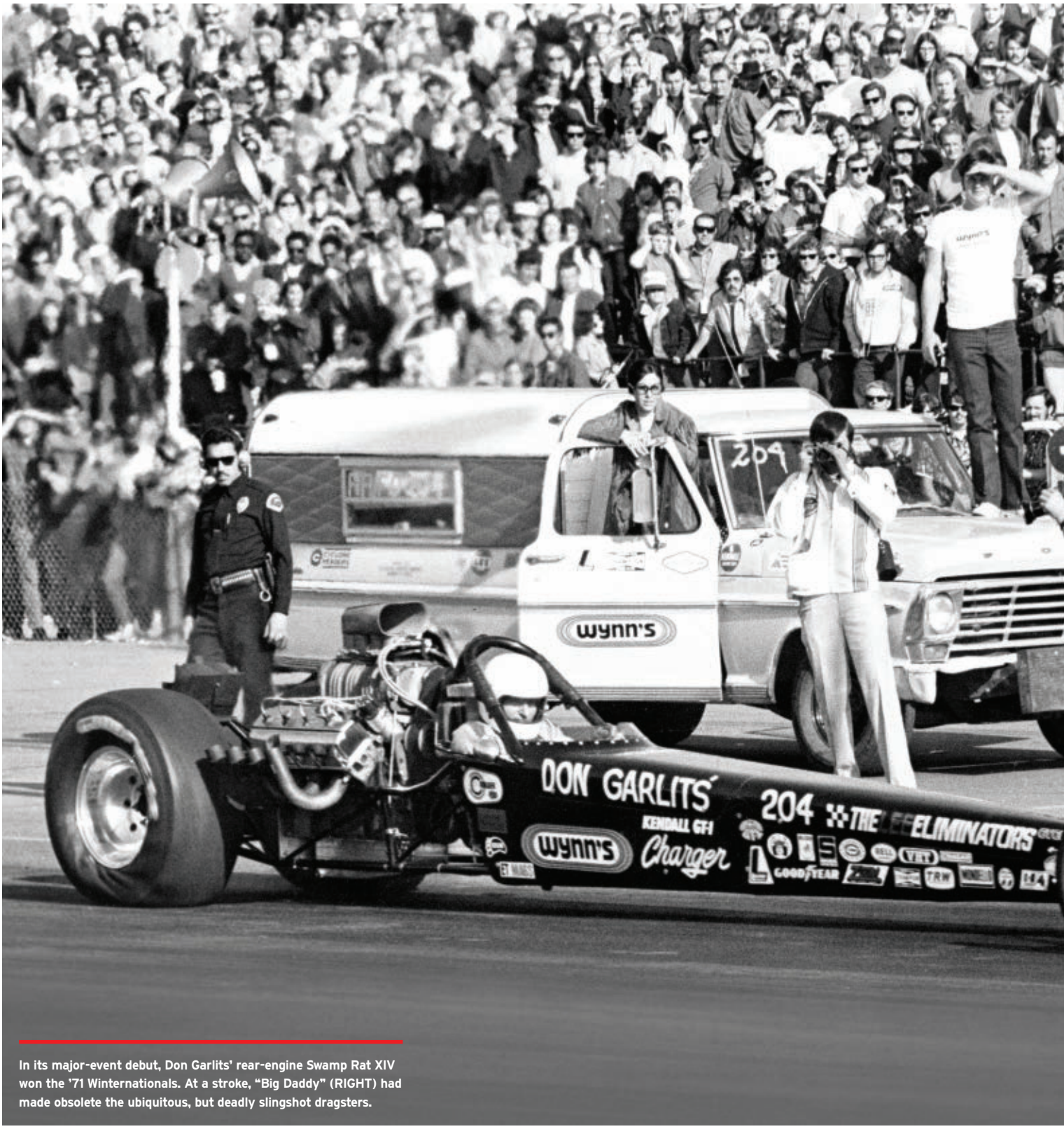
A NOD TO THE PAST, FUTURE

Coming full circle 40 years after winning the 12 Hours of Sebring with a 3.0 CSL, BMW recently unveiled the BMW 3.0 CSL Hommage concept car.

More than just a design concept that reimagines an icon of the past, the 3.0 CSL Hommage offers a raft of innovations that could make their way to BMW production cars in the not too distant future. A new 3-liter, straight six engine with electrically-aided turbocharger, and extensive use of light and strong high-tech composites are two such examples.

"Our Hommage cars not only demonstrate how proud we are of our heritage, but also how important the past can be in determining our future," says Adrian van Hooydonk, senior vice president, BMW Group Design.

BMW



In its major-event debut, Don Garlits' rear-engine Swamp Rat XIV won the '71 Winternationals. At a stroke, "Big Daddy" (RIGHT) had made obsolete the ubiquitous, but deadly slingshot dragsters.

BIG DADDY'S EPIPHANY

"I want to be ahead of the engine..." It took the loss of half of his foot, but "Big Daddy" Don Garlits' moment of clarity redefined the dragster and undoubtedly saved many lives.

WORDS Todd Veney | IMAGES National Dragster Archive

Laid up in Long Beach, Calif., with half his foot blown off and his once limitless future suddenly uncertain, the greatest drag racer of all time designed the car that would change the sport forever, "Swamp Rat XIV," from his hospital bed.

Spindly and spare in design, with no rear wing and initially no body forward of the driver's compartment, "Big Daddy" Don Garlits' first rear-engine dragster revolutionized Top Fuel racing overnight. But it wasn't, as many people think, the first of its kind. Rear-engine dragsters had been around in various forms since drag racing's infancy in the 1950s. Several designs not dissimilar to Garlits' existed before his, including cars driven by Art Malone, Bernie Schacker, and Dwane Ong, who won a major AHRA title in 1970 at New York National Speedway on Long Island.

"I didn't even know where I was. I didn't realize at first how bad it really was. I was in shock"

DON GARLITS

But none got anywhere in NHRA national event competition until Garlits' groundbreaking machine won the 1971 Winternationals in Pomona, Calif.

Just a day earlier, one of the great Top Fuel racers of all time, 11966 world champion "Sneaky Pete" Robinson was killed in a horrific top-end crash, another victim of the deadly "slingshot" dragster, which seated the driver at the absolute rear of the car, his legs wrapped around the rear end, feet straddling the clutch, and a fire-breathing nitro engine right in his face.

The rear-engine configuration that added 20 years to Garlits' career and saved the lives of countless drivers in the future was a product of drag racing's most dangerous era, a time when many of the best and most beloved Top Fuel drivers were being killed at an alarming rate. Robinson, Mike Sorokin and John "the Zookeeper" Mulligan, who each ranked right up there with Garlits and Don "the Snake" Prudhomme among the stars of the sport, died in violent accidents.

In September 1970, on the biggest possible stage – the final round of the NHRA Nationals at Indianapolis – "Superman" Jim Nicoll's car sawed itself in half just ahead of his feet as he crossed the finish line at 225mph. Prudhomme, horrified to see the front half of Nicoll's car slide past him in the shutdown and sure that his friend was dead, quit racing on the spot. (He later recanted after much deliberation and upon learning that Nicoll had, miraculously, survived with only a minor foot injury.)

Garlits saw the whole thing – he'd just red-lighted against Nicoll in the semi-final and was watching from the grandstands – and was more convinced than ever that he never wanted to go down the track again without the engine behind him.

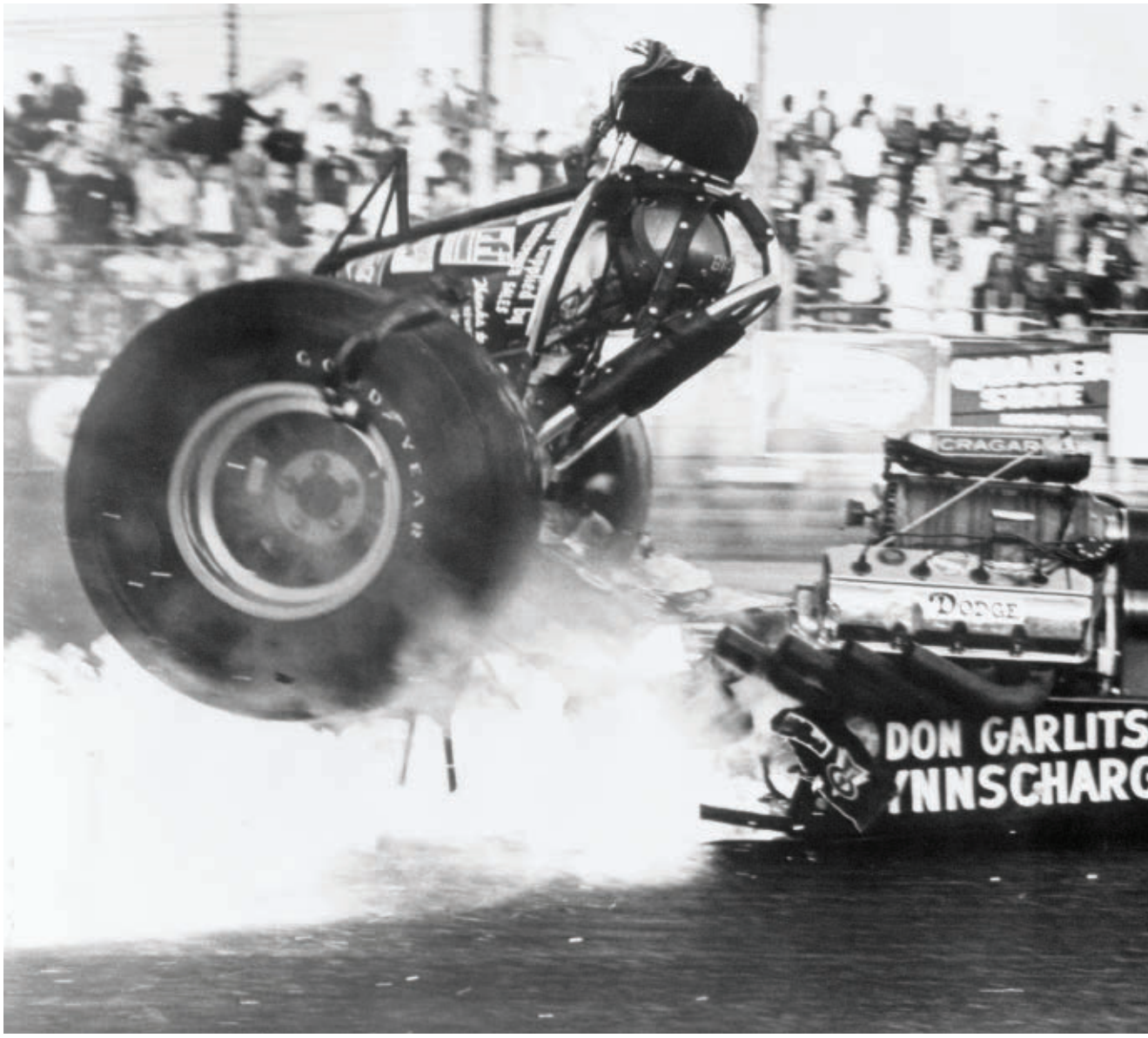
It had been six months almost to the >

"BIG DADDY" DON GARLITS: THE G.O.A.T.

Don Garlits' drag racing résumé is as spectacular as it is long. Try eight U.S. Nationals wins, three NHRA Top Fuel titles, and first driver to break the 170, 180, 200, 240, 250, 260 and 270mph marks, to name just a few of his achievements.

But it's also his relentless drive for innovation and safety, as well as his incredible longevity – he began racing in 1950 and ran his last NHRA pro national event in 2003, but recently set an EV dragster record, aged 82 – that puts him number one among his peers.

"Don Garlits is untouchable," says 16-time NHRA Funny Car champ John Force. "I always chased Don Prudhomme and Kenny Bernstein, but you don't chase Garlits. You'll never get there."



(RIGHT) Early testing of Swamp Rat XIV proved less than impressive – scary, even – until Connie Swingle's suggestion to slow down the steering ratio unlocked the car.

day since perhaps the most famous drag racing accident of all, Garlits' explosion and crash on March 8, 1970 at Lions Drag Strip on the outskirts of Long Beach.

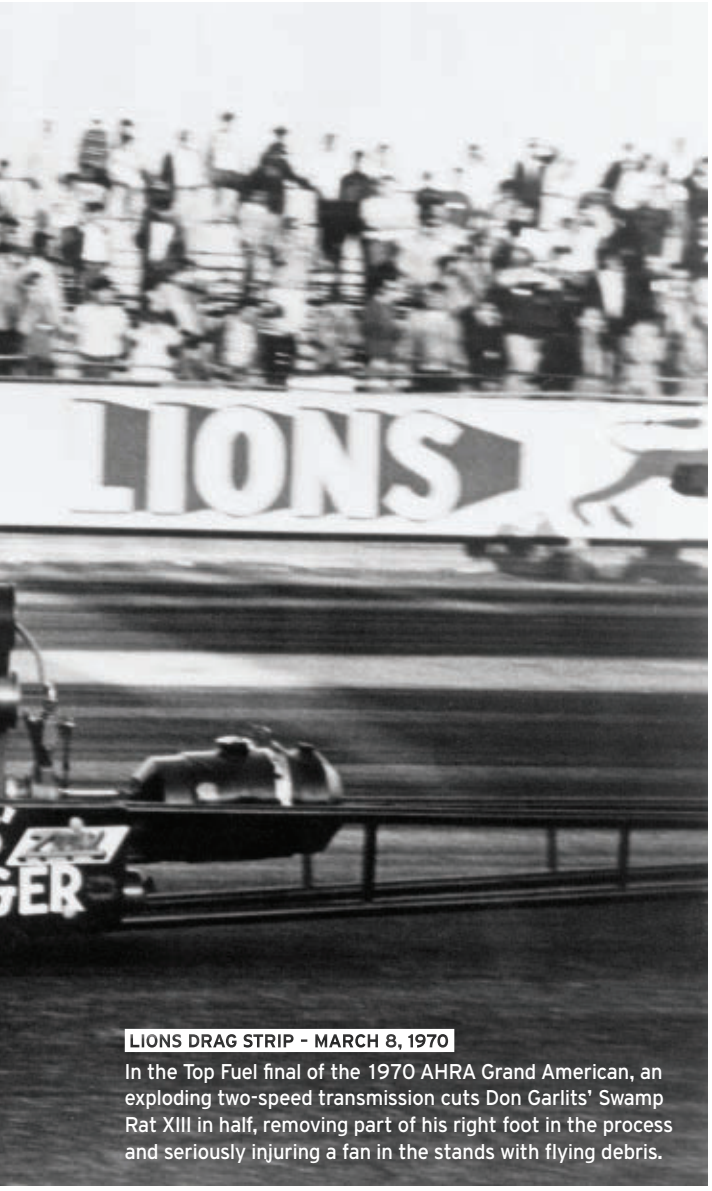
"Big Daddy's" car was cut in two just like Nicoll's was (from an exploding transmission, not an exploding clutch like Nicoll's), but even though it happened not far from the start, before he'd built up much speed, he did not escape unscathed. When he opened his eyes after finally tumbling to a stop, it wasn't just the front half of his car that was gone – half of his right foot was, too.

"I didn't even know where I was," Garlits says. "I thought I was at the finish line. There was blood all over the place, and I didn't realize at first how bad it really was. I was in shock."

That tragic accident, which also seriously injured a young fan in the stands who was struck by flying shrapnel, was the genesis of Garlits' rear-engine dragster. He formulated and constantly revised his design from his hospital bed during an excruciating two-month stay at Pacific Coast Hospital, and when he finally got back home to Tampa, he and his Okie colleagues, T.C. Lemons and Connie Swingle, worked side by side to create the chassis on which all subsequent Top Fuel dragsters would be based.

"It was just like a slingshot, but without the cage at the back," Garlits says. "It was about as simple as it gets."

Just 215in. long and as light as he could make it, Garlits' creation was a winner from the time it was officially unveiled in Jan. 1971 – back at Lions, of all places. But that was only after he'd struggled through the same setbacks and squirrely, terrifying



LIONS DRAG STRIP - MARCH 8, 1970

In the Top Fuel final of the 1970 AHRA Grand American, an exploding two-speed transmission cuts Don Garlits' Swamp Rat XIII in half, removing part of his right foot in the process and seriously injuring a fan in the stands with flying debris.

"It was just like a slingshot, but without the cage at the back. It was about as simple as it gets"

DON GARLITS

test runs that had made previous rear-engine pioneers turn back.

Initial testing near Garlits' Florida home went poorly, and he seriously considered shelving the whole project, but Swingle's suggestion to slow the steering from a 6:1 ratio to 10:1 changed everything. It transformed an ill-handling, unpredictable beast that even Big Daddy himself wasn't sure he could control beyond 200mph into a smooth, stable and safe racecar that seemed to be able to handle all the power Garlits could build.

"I had my doubts," Garlits admits. "You have to remember that every time one of those rear-engine cars got up around 200mph, it would crash. Everybody told me not to do it, and if it hadn't been for my wife Pat and Connie Swingle, I probably would have given up on it."

Instead, he persevered and went on to win the 1971 NHRA Winternationals in the car's major event debut, and then the IHRA Winternationals and the prestigious Bakersfield March Meet in succession. In June, with a wing now mounted between the rear tires for more downforce, he reset the NHRA national record at 6.44sec en route to victory at the NHRA Springnationals in Dallas. By then, everybody else was already hopelessly behind and scrambling to get >

(TOP) XIV ran without a rear-wing in the early part of 1971. (ABOVE) Don Garlits knew the risks inherent in drag racing, but was an active proponent for improving all aspects of safety in the sport.

BEST OF THE RAT PACK

REVOLUTIONARY RAILS

No Swamp Rat or any dragster built by Woody Gilmore, Kent Fuller, Don Long, Al Swindahl, Murf McKinney, or any of the great chassis builders, could ever be as impactful as Don Garlits' unbeatable 1971 car. But it wasn't his only history-making car or even his only revolutionary one.

Garlits' 1958 slingshot hit 180mph, making his name known outside his own household for the first time and forcing smug California racers, who dominated the sport in its earliest days, to begrudgingly accept that this nobody from the swamps of Florida was the real deal.

Swamp Rat XXII (BELOW) carried

National Dragster PArchive

"Big Daddy" to his first NHRA championship, to his fourth of eight U.S. Nationals titles, and to an incredible 5.63sec run at the World Finals at Ontario Motor Speedway on Oct. 11, 1975 that stood longer than any Top Fuel record ever – nearly six years. He smashed through the 250mph barrier with a 250.69mph speed in that same run, which ranks as the most historic one between 1964, when Garlits cracked the 200mph barrier in Great Meadows, N.J., until Kenny Bernstein eclipsed 300mph in 1992 in Gainesville, Fla.

Garlits' 1986 dragster (Swamp Rat XXX, BELOW) was his last great car and won the U.S. Nationals and his third and final NHRA championship, and featured a canopy over the cockpit a quarter-century before the Don Schumacher Racing dragsters of today. The strange-looking creation also had tiny, shopping-cart-like front wheels that launched a fad that would last until the early 1990s.

National Dragster PArchive

(TOP) Swamp Rat XXII delivered Garlits a first NHRA title. (ABOVE) XXX's famous flip at Englishtown in 1986. Garlits went on to clinch that season's Top Fuel crown.

THE FUTURE vs. THE PAST

Others had tried building and racing rear-engine dragsters, but found them to be virtually undrivable. When Garlits got Swamp Rat XIV hooked up for the 1971 season (BELOW, Columbus, Ohio; nearest camera), the writing was on the wall for the slingshots.

a rear-engine car of their own.

After winning race after race at backwoods tracks all around the country that summer, Garlits arrived in Indianapolis for the NHRA Nationals (drag racing's biggest race wasn't renamed the U.S. Nationals until 1972), where he made what many still consider the greatest run in history – a 6.21 that covered the field by the unheard-of margin of nearly two-tenths of a second. (Steve Carbone was No. 2 with a 6.39.)

Big Daddy dominated the first four rounds of eliminations, running better on his slowest run (6.32) than any of the other 31 drivers did on their best (6.39), but in the final allowed himself to become embroiled in the lengthiest, most memorable burndown of all time – nearly three minutes. Carbone, who always vowed that he'd get Garlits back for burning him down in the 1968 Indy final,

"I had my doubts. Every time one of those rear-engine cars got up around 200mph, it would crash"

DON GARLITS

won easily with a 6.48, while Garlits smoked the tires off the line and suffered what he still considers the bitterest defeat of his unparalleled career.

The year came to an anticlimactic end when Garlits ran low e.t. in the final round of the NHRA World Finals at Amarillo (6.55), but invalidated it with a foul start.

(LEFT) "Big Daddy" in contemplative mood at Englishtown, N.J., 1971. Garlits wasn't a trained engineer, but his constant quest for an advantage made him drag racing's greatest innovator, as well as its greatest driver.

Back then, the entire championship was predicated on who won that one round. Didn't matter. Gerry "the Hunter" Glenn was a deserving champion with an outstanding 6.59, but everybody knew who the king of Top Fuel was in 1971 – the same guy who ruled the '60s, Don Garlits.

With his innovative 1971 dragster, Garlits won more races than anyone else all year, ran far quicker and much faster than anyone ever had, and single-handedly catapulted chassis science further forward than any car ever had or has in the nearly half-century since. Only one driver, relative unknown Art Marshall, would ever win again in a slingshot. ■

REAR-ENGINED FLOPPERS?

THAT'S JUST NOT FUNNY...

The rear-engine configuration has been the only choice for Top Fuel chassis designers for 44 years now, but could it ever be a viable alternative for a Funny Car? Don't even think about it.

Several drivers tried it in the late 1960s and early '70s, most notably Doug Thorley, Fred Goeske, Eddie Pauling, Jim Dunn, and (believe it or not) John Force, whose first Funny Car, "The Nightstalker," was purchased from Hall of Famer Jack Chrisman, who got rid of it before he ever raced it.

Only Dunn's rear-engine Funny Car was truly a success. "Big Jim," now in his 80s and the crew chief for Funny Car driver John Hale, held his own

Marc Gewertz/NHRA

against superstars Don "the Snake" Prudhomme, Ed "the Ace" McCulloch, "Jungle Jim" Liberman, and Tom "the Mongoose" McEwen in the '70s. He even won an NHRA national event, the 1972 Supernationals at Ontario Motor Speedway. But Dunn abandoned the scary, unpredictable machine after just two years.

For one thing, the weight distribution was, and still would be, totally wrong. There wasn't enough downforce on the front end when Funny Cars were running 210 mph, much less the 300mph-plus speeds of today. But it isn't just that. Positioned so far forward in the car, with the windshield just inches in front of their face and their feet between the front tires, drivers wouldn't realize how sideways they were until it was too late to make a correction – just ask the guys who were crashing them in the 1960s and '70s...

Marc Gewertz/NHRA

(TOP) Funny Cars are front-engine for sound reasons. (ABOVE) That can be disconcerting when they go bang, but driver protection includes titanium/composite shields.

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IN FOCUS

GLOBAL MAZDA MX-5 CUP CAR

SHOOT LOCATION Statesville, N.C.
DATE July 7, 2015
PHOTOGRAPHY Peter Harholdt
WORDS Richard S. James

Almost from the very beginning 25 years ago, the Mazda MX-5 Miata has been raced. The three generations of MX-5 are now likely the most-raced production cars in the U.S., perhaps the world. And the first two generations, the NA and NB, serve as the basis for the most popular club racing class in America, Spec Miata.

With the third-gen, Mazda created a professional spec series, the SCCA Pro Racing MX-5 Cup. As the fourth-gen arrives on our shores, there was never any doubt that it would do the same with the new car.

But there are two big differences this time around. First, not only will this car be the basis for the Battery Tender Mazda MX-5 Cup Presented by BFGoodrich Tires in the U.S., it will also serve as the racecar for similar series in other parts of the world. Second, instead of supplying a list of parts and specifications for racers to build to, Mazda is building the car itself.

It's a route well traveled by Porsche, Ferrari, Lamborghini and Maserati. But when the 2016 Mazda MX-5 racecar goes on sale, it will be the least expensive race-ready car sold by a manufacturer, costing far less than even the cheapest of those marques' street offerings. Mazda's reasons for building it in-house are in large part because it will be a global racecar.

"For the global series, we felt it was important to maintain absolute parity with the build and specs of each of the cars," says John Doonan, director of Mazda Motorsports. "That was the impetus for bringing it in house. Secondarily, and ironically, our customers in the U.S. were asking for it."

While the 2016 MX-5 Cup was the target for the car in America, it's unlikely that the Global MX-5 Cup car will remain confined to that series. Ex-MX-5 Cup cars are already racing in a variety of series, and that is likely to happen again.

"From the very beginning our goal was to build a car that would be to the Global MX-5 Cup specs," Doonan says. "But other than changing a decal package, and potentially tires, customers could easily campaign the car in SCCA Club Racing, NASA, World Challenge or track days, and without making a serious modification. Our hope was to build the best value in sports car racing."

That value, he adds, isn't only in the cost of the car, but the possible rewards. The champion of the Battery Tender Mazda MX-5 Cup Presented by BFGoodrich Tires earns a scholarship to move up the sports car racing ladder with Mazda. The champion of the Global Mazda MX-5 Cup shootout, the first of which will be at Mazda Raceway Laguna Seca late in 2016, will earn a test in Mazda's TUDOR Championship-contending Prototype racecar.

Richard S. James

RAISING THE BAR

Drivers who've tested the Global MX-5 Cup car during its development say that it's more nimble, better under braking and acceleration, and quicker, too.

Mazda's fourth-gen Miata racer, in the form of the Global MX-5 Cup car, has some tough acts to follow, but feedback from the development program and testing says it's more than up to it.

FROM ROAD TO RACE TRACK

Mazda's fourth-generation MX-5, the ND, is an exceptional starting point for a racecar.

Mazda had a strong formula in the NC-based MX-5 Cup car, so it didn't want to stray too far from that, notes John Doonan.

That means a similar level of prep, a similar level of cost to run, and still a racecar that an individual racer could maintain and be competitive. Starting with a clean slate, though, meant the development team could come up with the ideal car from the beginning.

The task of developing the car was largely placed on the shoulders of prep shop and racing services house Long Road Racing, whose principal, Glenn Long, has served as a crew chief for a variety of racing efforts, most recently for the Freedom Autosport MX-5s in the Continental Tire SportsCar Challenge.

His son, Tom, serves as chief test driver and has raced every generation of MX-5. He's won races as a driver for Freedom Autosport, including Spec Miata, and currently drives a Mazda Prototype in the TUDOR United SportsCar Championship.

"The current MX-5 Cup car was really built and developed over a series of seasons," says Glenn Long. "For this car, on the other hand, Mazda has requested we engineer it from the beginning. Doing the kinematics and compliance testing, seven-post rig testing and chassis analysis has really allowed us to fabricate the various pieces and parts of the vehicle correctly from the beginning."

It also gave the Longs some pretty good insight into the ND MX-5 and what makes it not only a better road car, but will make it an outstanding racecar as well.

"First and foremost is the chassis itself, which is a much stiffer platform," Glenn explains, while noting that it goes well beyond that. "The SKYACTIV philosophy is one of light weight coupled with efficiency. That's created some opportunities for us. The car is very, very light, so we get to go with a lighter spring rate, and lighter components throughout the car, which are still very strong and durable."


Richard S. James

RUNNING WITH THE PACK

Testing with the current-spec MX-5 racecars in 2015 highlights the visual differences between the two generations of Mazda's iconic, rear-wheel-drive roadster.

The Global MX-5 Cup racer is lighter, lower and more compact than its gen-3 predecessor. Front overhang is 45mm (1.77in.) shorter, and wheelbase is reduced by 20mm (0.79in.).

Tom Long sees several improvements over the previous generation that are built into the new car, including a couple that really stand out. He says the ABS calibration makes threshold braking easier to achieve. The other thing he notes is the different rear suspension geometry, where bump steer goes to toe-in as the rear unloads during braking as opposed to toe-out. These two factors combine to make the car much more confidence-inspiring for a driver.

The most important thing, Tom says, is, "We didn't take away any attribute the new MX-5 has in its street car form. We've just enhanced every capability."

KEEPING TRACK

For the latest news from the 2015 MX-5 Cup series, or updates on the upcoming Global MX-5 Cup series, visit **www.mazdamotorsports.com** or check out **@MazdaRacing** on Twitter.

MAZDA MOTORSPORTS


Mazda

LIGHTER IS THE KEY

The Global MX-5 Cup car certainly has a great starting platform in the form of the 2016 Mazda MX-5 Miata road car.

Mazda reduced the weight of the latest MX-5 by 148lbs, compared with the previous-gen car. Its 2-liter, inline-4 SKYACTIV engine produces 155hp, which is 12 less than its predecessor. *But* the all-important power-to-weight ratio is up: 14.9lb/hp, compared to 15.3lb/hp in the old car.

Add in more torque, a lower CG and the MX-5's traditional, near-perfect 50/50 weight split and the raw materials are there for an exceptional spec racer.

The road car's 2-liter, inline-4 SKYACTIV engine produces 155hp @ 6,000rpm and 148lb. ft torque @ 4,600rpm.

FINDING SPEED
Road car exhausts are made to keep things quiet; racecar exhausts are made to remove the spent gases from the combustion chamber as efficiently as possible. Mazda and Long Road Racing developed a header and exhaust system that immediately gave them 2mph on the straight at Mazda Raceway Laguna Seca.

ENGINE AND TRANSMISSION

BETTER POWER TO WEIGHT; MORE TORQUE

The 2-liter SKYACTIV-G engine in the ND MX-5 racecar is the same capacity as the MZR in the previous generation. It makes a tad less horsepower in stock trim, which isn't a problem due to the reduced weight of the chassis. However, it makes significantly more torque.

Long Road Racing found that the stock airbox flows really well, so it's not making any changes to the intake side of things; but it is adding a stainless steel, four-into-one, long-tube header and exhaust system that bumps power up a little. More is expected to be found with a new ECU.

The transmission is one area of big changes. The differential is much more compact, with a smaller gear. As a result, since the gear ratio has to be made up somewhere, the diameter of the gears in the transmission are significantly increased.

"That's really good, because we've now gone to a larger, more durable synchronizer," says Glenn Long. "For racing, [previous generation] transmissions have been a little light on the durability side."

Even with the larger diameter gears, the transmission is still a smaller package, and the new design eliminates any plastic.

Making the car capable of being raced anywhere in the world presented some challenges, partly because series in countries or regions where street cars are right-hand drive will remain right-hand drive. That means the development team had to ensure that the headers and exhaust wouldn't cause interference with the steering shaft. It also required designing a rollcage that not only meets FIA specis, but is compatible with the seat on either side of the car. Only a single cross bar has to be moved for a left-hand-drive cage to become a right-hand-drive cage.

TECHNICAL MORSELS

COMPLIANCE

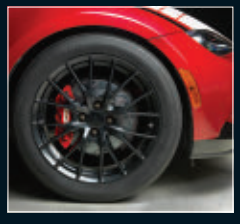
Compliance is a big part of the development program. Every non-factory part that Long Road Racing puts on the racecar will have a serial number for easy recognition. The Global MX-5 Cup car will also have a new ECU that, although tunable by the manufacturer, is designed to be tamper proof.

COOLING SOLUTION

For differential and transmission cooling, Mazda and Long Road Racing's neat solution was to take two 4in. x 12in. oil coolers and package them with a rheostat-controlled cooling fan. The compact unit sits under the trunk, in the position where the muffler is on the road car.

ADDED PARTS

Chief among the short list of performance items added to the Global MX-5 Cup car were stiffer springs and corresponding adjustable dampers, a stiffer front swaybar, brake ducts to cool the stock Brembo front brakes (RIGHT) that are an option on the road car, and a freer-flowing exhaust.



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MOTUL

A VERSATILE CAGE
Because the fourth-gen Mazda MX-5 will race globally, the rollcage was designed to be FIA compliant. However, Long Road Racing also took into account drivers wishing to compete in SCCA Club Racing or NASA. Hence, the cage has eight attachment points and is designed for a 6ft 4in. driver to meet the SCCA's requirement for a 2in. minimum helmet clearance. One design of cage is suitable for left- and right-hand drive cars, with the single crossbar on top of the cage (LEFT, in left-hand drive spec) the only difference between versions.

DEVELOPMENT

TESTING IN PLAIN SIGHT

The process of developing the ND MX-5 into a capable racecar began with complete analysis of the road car. Full math models were developed using kinematics and compliance testing and multi-post rigs. Everything that could be measured, was.

"Virtually anything that rotated, we measured speed, velocity changes and temperatures, trying to identify any potential problem areas for the customers so we could address it before it gets into their hands," Glenn Long says.

Math models acquired, Long says the project team had a good idea in which directions to go with spring rates, dampers, brake compounds and tires so that they would need to try as few combinations on the track as possible.

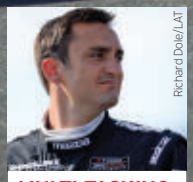
Unlike most racecar development, though, not all the testing was done in private. Mazda and Long Road Racing brought the two test mules to several events, including the MX-5 Cup rounds at Mazda Raceway Laguna Seca, running them during testing with other cars on track.

"That gave us some more useful data," says Long. "It helps us understand how the car aerodynamically performs with other vehicles. We only have two prototypes for our development program, so there's not a lot of opportunity for drafting. It also gave us some real, live, back-to-back lap time comparisons."

Richard S. James

Running test cars at a number of MX-5 Cup rounds, including Mazda Raceway Laguna Seca (ABOVE), not only generates data, but provides a useful performance benchmark.

THE DRIVER'S VIEW



Richard Dole/LAT

MULTI-TASKING WITH MAZDA MOTORSPORTS

TOM LONG
Long started out in grassroots sports car racing with the SCCA's Showroom Stock and Spec Miata classes.

As well as being lead test driver for the Global MX-5 Cup car, the 33-year-old is a full-season driver for Mazda's SKYACTIV Prototype in the TUDOR United SportsCar Championship.

A car designed for a spec series needs to deliver on a number of fronts. It needs to be consistent, a good training ground for young drivers and, of course, fun to drive. Chief development test driver for the Global MX-5 Cup car Tom Long feels those goals have been achieved – and notes that it's quick, too.

"The car is lighter, and that absolutely comes through in the driving enjoyment," says Long. "It's much more responsive; the braking response and acceleration have both moved on another step compared with the current model.

"The new MX-5 racecar is able to generate more lateral grip and, more than just pure cornering G force, you'll find it's a lot more responsive through quick transition sections because it's more nimble," he adds. "It's able to carry more speed and attack the corner with more momentum.

"Driving is a finesse activity, even at the limits of grip. But the car is more 'tossable,' and more predictable when you do that."

For those who might be using the car to compete in open classes, Long feels that there is something for them, as well.

"Where the MX-5 already excels is in the turns; the lack of speed you need to lose to get through the corner compared to other cars," he explains. "The new car is going to do that even better. But now that the car is a more capable vehicle under braking and acceleration, I think it's going to be more competitive at tracks beyond the scope of just a 'handling' track."

While Mazda has kept lap times close to its chest, defending MX-5 Cup champion Kenton Koch, who sampled the Global MX-5 Cup car in its early form at Mazda Raceway, says he expects the car he describes as "easier to drive" will be anywhere from a second to two seconds faster than the previous generation.

The more nimble fourth-gen MX-5 makes for a more responsive racecar through quick transition sections.

Richard S. James

THE ROAD LESS TRAVELED

Think of a rally car and it's probably not a Toyota RAV4. But Ryan Millen aims to change that...

"Something's going on here," notes Pikes Peak Hill Climb and rallying legend Rod Millen of his family's motorsports accomplishments. "I haven't quite figured it out yet, but we've all been attracted to doing something unique and different."

In Rod's case, "unique and different" includes smashing the Pikes Peak outright record in a pickup truck – a no-holds-barred, fire-breathing, turbocharged Toyota Tacoma, no less. And the latest Millen to take the road less traveled and race outside the box is Rod's son, Ryan.

The 2014 SCORE Tecate Baja 1000 class winner is gearing up to go stage rallying this year...in a production-based 2015 Toyota RAV4 LE.

Not an obvious choice? You could say that, but taking a different approach is

what makes it such a compelling project for Millen, and the 30-year-old is confident that Toyota's family-friendly, compact crossover SUV is a strong platform from which to develop a capable rally car.

As he's quick to point out, there's a big difference between "can't be done" and "hasn't been done..."

The rally-spec Toyota RAV4, built to Rally America's 2WD Open Class rules, sports a stock transmission and a stock 2.5-liter, four-cylinder, double-overhead cam engine that pushes out 176hp and 172lb.ft of torque.

Millen, along with brother Rhys and his crew, removed more than 500lbs of weight, while adding a roll cage, mandatory safety equipment, and upgrading to front and rear TEIN suspension. Pirelli gravel rally tires complete the makeover, but it's hardly a transformation of World Rally Car proportions.

"That's the whole point," explains Millen. "We want to prove the RAV4's off-road capabilities, so we want to keep as much of it stock as possible. Apart from the shocks and the tires, it's pretty

WORDS *RACER* staff
IMAGES Chris DeLorenzo

much your daily driver, and it's going rallying. I mean, who's doing that?

"You might be asking why we chose to run it as a 2WD car when Toyota makes an all-wheel-drive RAV. But to be competitive as an AWD car in the Open Class, we'd need to fit a turbocharger and stuff, and that's not what this is about."

With the RAV4 scheduled to make its rally debut in mid June, a tight build and development schedule saw initial testing begin in late May on a network of U.S. Army-maintained gravel roads on the California/Arizona border.

What's a stroll for an M1 Abrams tank might not be so good for a near-stock RAV4, but Millen was impressed by the initial performance.

"It was eye opening for me," he says. "I admit I had preconceptions – it would have a high CG, it wouldn't stop well – but it impressed and surprised me. For starters, the CG is lower than you think, so it handles way better than you're expecting, and it stops really well, too.

"But then you start appreciating some of the positives that come from it being an SUV – the longer wheel travel, the beefy components. It's a weird dynamic: it feels a lot like a car, but with the added benefits of an SUV."

But testing is one thing; going up against experienced opposition, in tried-and-proven machinery, on an actual rally is quite another. And that would come on the fast, loose gravel stages of the Idaho Rally, June 13-14. ■

• IN THE NEXT ISSUE: THE DEBUT

(MAIN and LEFT) Ryan Millen throws up the dirt during early testing of the Toyota RAV4 rally car on gravel roads on the California/ Arizona border.

IN THE HANDS OF FATE...
Ryan Millen's navigator for the Toyota RAV4 rally program will be his fiancée, Christina Fate. And, yes, that is a terrified hot dog on the side window, courtesy of sponsor Wienerschnitzel...

FROM BAJA TO THE WOODS

INTENSITY UPGRADE

"In terms of the actual driving, I know I'm at the start of a steep learning curve with this move into stage rallying," admits Ryan Millen, who anchored Toyota's Stock Full class win with a Tundra TRD Pro on last November's SCORE Tecate Baja 1000 (BELOW).

"Racing in the Baja 1000, you might be behind the wheel for 10 hours – which is a long time – but you'll maybe be at 80 percent.

"In rallying it's shorter bursts, split into stages – maybe a couple of hours of actual competitive driving in total. But it's incredibly intense; every second is precious. And it's way more brutal – the hammering the car is getting is way more."

THE LITES ARE ON

American open-wheel racing had a vacant niche that wasn't obvious until the arrival of Formula Lites. Now, though, it makes sense.

WORDS David Malsher | STUDIO IMAGES Boyd Janes

BIG NAMES, SMALL CAR

For Honda Racing/HPD to have partnered with a brand new junior series, and for Pirelli USA to do likewise, Formula Lites has to be doing something fundamentally right... And those brands in turn will help grow the series' stature.

Junior formula cars are often the last in line to be given up-to-date technology in order to keep costs at a reasonable level for teams and would-be drivers. Old, proven and "cheap" tech is seen as the default way to stretch a sponsor's dollar.

So how about if a series ran turn-key junior formula cars that were reasonably priced *and* used technology that would prove useful training for drivers and crews aiming to reach more exotic levels of open-wheel racing? Well, that's exactly the kind of series that the SCCA Pro Racing-sanctioned Formula Lites aims to be.

"From a cost-containment standpoint, Formula Lites fulfills a need at this level of racing"

JEFF BARROW, HONDA

The Crawford FL15, the work of Crawford Composites, LLC, based in Denver, NC., uses a carbon composite monocoque built to 2014 FIA Formula 3 technical regs, and boasts a six-speed, paddle-shift operated sequential gearbox, dash display with log-in GPS lap time and track mapping, internal three-axis accelerometer, gear indicator and shift lights, and an 8MB logging memory with USB download. The price? That would be just $120,900, excluding a tire lease from the series' official supplier, Pirelli, but including a 2.4-liter, four-cylinder Honda K24 engine, tuned to a useful 220hp.

Formula Lites is the brainchild of High Performance Group's Dennis McCormack (former team manager for Arciero Racing Teams, which raced in CART Indy car), Ryan Arciero (a Baja 1000 winner) and Max Crawford of Crawford Composites, which built the Mazda RX-792P in the early '90s, as well as Daytona Prototypes for the Grand-Am Rolex Sports Car Series.

"The idea started in 2008, actually with Kris Nissen who was then VW motorsport director," says McCormack. "We were talking about North America not having any junior open-wheel cars which would meet the FIA specs. We just didn't have anything that you would describe as 'current' or truly modern.

"The other thing was that I recalled from running a team how we always got nickeled-and-dimed for each little part – everything was extra. So I wanted to keep costs down and sell it as a *complete car*."

Jeff Barrow, commercial motorsports manager at Honda Performance Development, was attracted by such an ethos.

"I immediately felt like Honda would be a really good fit for them and Formula Lites would be a good fit for us," he says. "At Honda, we're always looking to offer an engine package for every level of racing. From a cost containment standpoint, Lites fulfills a need at this level of racing and Honda is well-known for offering reliable and cost-effective engines, so the connection made a lot of sense.

"It filled a hole for us, too, as I think Lites will pull drivers from karts and Formula F. Then, above Lites, we have a >

GET ON THE LITE TRACK

For more details, visit **www.formulalites.com**. For series information, contact Dennis McCormack on (781) 545-7411, or at dennis@highpg.com. For sales information, call Max Crawford and David Cooper on (704) 483-4175.

FORMULA LITES

SERIES PARTNERS

Honda Racing HPD

PIRELLI

Bruce HIGH PERFORMANCE TRANSPORTERS

2015 FORMULA LITES CRAWFORD FL15-HONDA
TECHNICAL SPECIFICATIONS

Chassis/body Carbon composite monocoque built to FIA F3 2014 spec. Composite bodywork. Front and rear rollover structure

Engine Honda K23. 2.4-liter, 4-cylinder, 16-valve, 220hp
Tires Pirelli racing tires
Brakes F/R Performance Friction rotors and calipers

Transmission Six-speed sequential shift, pneumatic paddle-shift system
Suspension Double wishbone, pushrod adjustable ride front and rear, two-way adjustable dampers. Front and rear adjustable rollbars
Steering Rack and pinion

Safety FIA-spec six-point harness, onboard fire control system, headrest compatible with HANS device, FIA-spec extractable seat, rear attenuator, wheel tethers

Data System Dash display with login, GPS lap time and track maapping, internal three-axis accelerometer, gear indicator and shift lights, 8MB logging memory with USB download

Weight 1,150lbs
Wheelbase 108in.
Track F/R 68/66in.
Fuel capacity 12 gallons

Price $120,900, race ready

Formula Atlantic engine package coming out, too. So those are nice progressive steps for young drivers."

In July, Indy car and sports car racer Katherine Legge was invited by Catherine Crawford (daughter of Max) to try out the Crawford FL15. Catherine was Legge's assistant race engineer for the 2012 Indy 500 and fulfills that role – as well as aerodynamicist and data acquisition engineer – at Crawford Composites. The chosen venue was Carolina Motorsports Park in Kershaw, S.C., and Legge was left deeply impressed.

"The car is mega!" Legge exclaims. "I've driven a lot of ladder-series cars, and they all have their particular idiosyncracies that are unique to them and you adapt your driving style. Up to now, the Atlantic cars have been my favorites.

"But the FL15 is a car where you get in and can immediately start leaning on it. You're not having to drive around a certain quirk; you feel familiar with it straight away. And most impressive for me was that every change we made did exactly what it was intended to do. That means it will be a great tool for drivers coming straight into cars from karting, because they'll get to learn their craft rather than learning the particular style for one type of racecar." (*For more of Legge's insights, see sidebar on right.*)

That latter point is something also appreciated by Jeremy Dale, owner of JDX Racing, for whom driver Vinicius

Despite being designed with cost containment in mind, the Crawford FL15's componentry comes from top-tier sources. For example, Performance Friction provides the car's stopping power.

Papareli won three of the first four races.

"With the concept of this car, I think Dennis McCormack, Ryan Arciero and Max Crawford have hit a real sweet spot," says Dale, who was president of RuSPORT, a team that took A.J. Allmendinger to the Atlantics championship, and scored several

wins in Champ Car with Justin Wilson. "Vinicius has stepped right out of karts [in which he was very successful in his native Brazil] into a car that feels very natural for him in terms of acceleration, braking and handling. It has a natural tempo that will teach him about racecars in general, but because of its technology and behavior, it's also good preparation for what's to come at the next stage of a young driver's career."

While Dale admits the car's cost containment and McCormack's no-hidden-extras ideology were deeply appealing, it was seeing commitments from Honda and Pirelli that convinced him to get involved.

"Honda has a great history in open-wheel racing," says Dale, "but in North America, they're best known for Indy cars, while Pirelli is most famous as Formula 1's tire supplier. To see those brands commit to a U.S. junior series is very significant and endorses the Formula Lites concept."

"With the concept of this car, I think McCormack, Arciero and Crawford have hit a real sweet spot"

JEREMY DALE, JDX RACING

It's likely this same reasoning will play a major role in convincing other team owners to commit for 2016. Formula Lites may have just found the perfect niche in U.S. open-wheel racing. ■

Terry Hall Photography

LEGGE LOGS THE MILES

BEHIND THE WHEEL

"It's so well balanced that Honda could put an even more powerful engine in it and bigger wheels on it and you'd have one chassis that could provide two steps on the motorsport ladder," says Katherine Legge, following her test of the Formula Lites Crawford FL15-Honda at Carolina Motorsports Park.

"It was such good fun and clearly capable of handling a lot more horsepower. At the moment, I'd say it is the perfect racecar for coming straight out of karts."

As Legge alluded to (*see main text*) the Formula Lites car's characteristics should form a strong early learning center for rookies by behaving and reacting as it ought to.

"If you carried too much speed in, you got a little bit of understeer, and if you turned in too aggressively, you got a bit of oversteer, so it's definitely predictable. In the fast stuff, it was very confidence-inspiring, and we kept trimming it out and trimming it out and it remained neutral."

Legge is also swift to note that the competence and modernity of the car is unusual at this level of racing.

"To have the paddle shift gearbox, to have the car meeting the FIA Formula 3 crash safety requirements, and with an extractable seat and so on... For a car to be this modern and this well developed for only $120k is very impressive, in my opinion."

Terry Hall Photography

Formula Lites embarked upon its debut season of racing in 2015. Grids for the junior formula are set to swell next year.

EXTREME MACHINES

Shea Holbrook races a Honda Civic touring car and a jet dragster. How's that for two extremes?

WORDS & IMAGES Richard S. James

For exploring the far reaches of the auto racing spectrum, it's hard to imagine a longer, more extreme journey than the one Shea Holbrook takes.

One weekend she's racing a 200hp Honda Civic on a road course as part of the Pirelli World Challenge. On another, it's a near-300mph jet dragster on dragstrips in the IHRA. A trio of 40-minute road races with 30 other competitors around her on the track, then it's a couple of passes a day that translate to a few seconds of competition against a single opponent.

At a road course she's a team owner with responsibilities for making sure everything happens the way it's supposed to and the team is where it needs to be when it's supposed to be, plus managing the business side of the sport. At the dragstrip, her sole responsibility is to get the car down the track as quickly as possible.

It doesn't get much farther apart than that within the realm of motorsports. At least she's racing on pavement in both cases, and both vehicles have four wheels...

Now in its sixth year, Shea Racing runs the Civic in PWC's Touring Car A category for Holbrook, plus two Touring Car B entries for Randy Smith and Tom Noble. She's had an affiliation with Lucas Oil for most of that time, ever since she was working on a deal with Team Lucas member K&N Filters at the Performance Racing Industry show. K&N's dance card was full, but they liked what they saw in Holbrook and introduced her to Lucas, beginning a long-standing association.

"They walked me across the floor to Lucas Oil where I met some of the head guys in the motorsports division," she says. "I think based off the positive recommendation from K&N, they took a deeper look into who Shea Holbrook was and what Shea Racing was all about."

This season, she is missing her first World Challenge races since she started in order to do the drag racing. Faced with budgetary constraints and with an offer to drive the Florida Tech jet dragster for Larsen Motorsports in the IHRA Nitro Jam Drag Racing series, it was necessary, she felt, to branch out.

"This jet dragster team called and said they were looking for a driver," she explains. "They told me that they thought I fit the final piece of the puzzle. I thought about it for some time, because strapping yourself to a pretty explosive piece of machinery that goes almost 300mph does take some thought. From a career standpoint, I had to think, 'What will be rewarding about this?' There were a lot of things I had to think about. For my personal reasons, trying to elevate my motorsports career, I decided to do it. I thought that it would be fun, and I knew I was going to be working with a team that was more than capable."

Shea Holbrook (ABOVE) began racing professionally in Pirelli World Challenge in 2010. For 2015, she's added jet-powered drag racing in the IHRA Nitro Jam (RIGHT).

But Holbrook's not stepping completely away from driving in World Challenge by any means. In the season opener at Circuit of The Americas, she scored a pair of third-place finishes. Then, in the next event, at Canadian Tire Motorsports Park, she got nudged into a wall in the first turn of the first race, ending her weekend.

She plans to be back behind the wheel at Mid-Ohio Sports Car Course in mid August. But for the most part, her focus is on managing the team and the behind-the-scenes business, with mother Erin and father Jeff handling things at the track on the weekends she's drag racing.

It's the next step in her journey that began with visiting a friend of her father's at a club race at Daytona. That led to

Shea Holbrook finished second in the Pirelli World Challenge Touring Car A points in 2014, taking five class wins in her Shea Racing Honda Civic Si. This year, she'll run a limited schedule, but has already achieved two podiums at the CoTA season-opener.

riding shotgun in a Richard Petty Driving Experience car around the Daytona tri-oval.

"That's what sparked my interest in motorsports," she explains. "I remember looking out the windshield once, and then being fascinated with the driver and what he was doing. From the passenger seat,

"Strapping yourself to a piece of machinery that goes almost 300mph does take some thought"

SHEA HOLBROOK

not knowing anything about racing, the G forces...it was a very different feeling than I'd ever felt before. He was in complete control of the car, and I was really kind of staring at him the whole time. He realized it and asked if I was OK. I said 'Yeah! Go faster! Go faster!' All I needed was those laps riding shotgun to really change my perspective of how I wanted to move forward as an athlete."

Her previous athletic pursuits included competitive water skiing, which her father had taken up as a hobby. But a gnarly wreck on the water put paid to that idea. So racing was it, and she chose Pirelli World Challenge for a variety of reasons. In fairly short order, she became the first woman to win in Touring Car, in front of the IndyCar Series fans at the Toyota Grand Prix of Long Beach in 2011. The series was different then, with three classes – GT, GTS and Touring Car – all racing at the same time. Now PWC has grown so much that each class races as standalones, sometimes on different weekends at different venues. But back then she was on track at the same time as some pretty big names in sports car racing – and having to stay out of their way.

"You know you're going to get great exposure," she says, explaining one of the things that first attracted her to PWC as >

(ABOVE) Shea Racing runs multiple cars in the Pirelli World Challenge. (LEFT) On weekends when she's in the jet dragster, Holbrook can concentrate solely on driving.

she was starting out. But racing in such a high profile series brought its own pressures. "With the classes racing together, I was sharing the track with people like Cadillac's Johnny O'Connell, so you have the GT class champ blowing your doors off. The eyeballs are on you; they know I'm the new driver on the block; I have to make sure that I'm predictable, that I'm not making problems for these GT guys. It's a great learning experience."

That's less of an issue now that the Touring Car classes have their own races. It's certainly not the case in drag racing, where she once again finds herself the new racer on the block and is enjoying the new and very different challenge.

"The hardest part from a driving standpoint is that drag racing is all about going 10-tenths the second you get in the car," says Holbrook. "There's no such thing as warmup; it's game on from the time you belt up. Half the time you don't know if the car is going to run, or if the afterburner is going to work, or if the change they made fuel-wise is going to take you in a positive direction. There are a lot of unknowns because you don't have the track time."

It's been an adjustment to get used to making only two passes a day, when she's used to a couple of practice sessions, qualifying and three races over the course of a weekend. But those few seconds of racing in the jet dragster are quite intense.

"All my road racing friends ask what it's like," she says. "It's hard to explain it, but in road racing, you're thinking in split seconds; in drag racing, you're thinking in nanoseconds. You have no time to make a mistake, and if you *do* make a mistake, you have to recognize it in a nanosecond, decide what to do and then do it. It's a totally different mindset."

"In road racing, you're thinking in split seconds; in drag racing, you're thinking in nanoseconds"

SHEA HOLBROOK

Add in the factors of racing at night with the accompanying tunnel vision, in a thrust-propelled vehicle that builds more power the further it goes, and it's a rush of sensations. And Holbrook can appreciate those sensations even from outside the car.

"Drag racing is cool," she enthuses. "It's testament to man building power, and wielding that power for a few seconds. It's incredible to sit in the stands at a race and have the sensation of the stands moving, your eardrums feeling like they'll burst, the heat on your face... It's an unbelievable experience and it all happens in a matter of seconds." ■

A HELPING HAND

EVERY LITTLE ADVANTAGE COUNTS IN PIRELLI WORLD CHALLENGE. ENTER LUCAS OIL...

The differences between a Honda Civic Si road car and the one that Shea Holbrook races in the Pirelli World Challenge Touring Car A class are small and few. Limited suspension tweaks, uprated brake pads, brake ducts for cooling and a performance exhaust are the main mechanical differences. Because Holbrook is racing against other similarly prepared Civics – plus Kia Fortes, Scion FR-Ss and Mazda RX-8s – she'll take any edge she can get. Which is where Lucas Oil technology comes in.

"The Lucas Oil guys make a great lightweight differential fluid that really reduces the drag for us and gives us a little bit of a performance advantage," explains Shea Racing crew chief Nick Chorley of the L9 gear oil. "It's a huge thing. We're running front-wheel-drive cars, and we're not allowed to modify the transmission, so we're looking for every little thing we can get to help us, and the lightweight fluid really makes a difference."

It's been valuable in extending component longevity as well, as Chorley notes: "Typically, we run one transmission all season long. Honda makes a great product, but I think we're one of the only teams doing that, and the Lucas Oil products are a big help in being able to achieve that."

Lucas Oil is in the engine as well, and Lucas detailing products are used on the outside of the car. Slick Mist Speed Wax makes removing the tire rubber that can stubbornly stick to bumpers much easier and makes for easy cleanup and shine in between on-track sessions.

Typically, Shea Holbrook's Honda Civic Si runs a single transmission for a season, and Lucas Oil products help make that happen.

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INDY LIGHTS PRESENTED BY COOPER TIRES

#12 Mazda/Doug Mockett & Company/Rising Star Racing/
The Stutz/BAD/OMP - Juncos Racing

AGE	21
HOMETOWN	Orlando, Florida
RESIDENCE	Indianapolis, Indiana
WEBSITE	SpencerPigot.com
TWITTER	@SpencerPigot
STATUS	Second in the point standings with four wins & three additional podiums after 10 rounds

COOPER TIRES GRAND PRIX OF TORONTO
POWERED BY MAZDA

GARETT GRIST

PRO MAZDA PRESENTED BY COOPER TIRES

#5 Lander Property Management - Juncos Racing

AGE	20
HOMETOWN	Grimsby, Ontario, Canada
RESIDENCE	Grimsby, Ontario, Canada
WEBSITE	garettgrist.com
TWITTER	@gristgarett
FACEBOOK	Garett Grist
STATUS	Fifth in the point standings with one win, one third & six top-five finishes after 11 rounds

COOPER TIRES PRO MAZDA
GRAND PRIX OF TORONTO

NICO JAMIN

COOPER TIRES USF2000 POWERED BY MAZDA

#2 Synova Automotive Eco-Plastics -
Cape Motorsports with Wayne Taylor Racing

AGE	19
HOMETOWN	Rouen, France
RESIDENCE	Coconut Creek, Florida/Normandy, France
WEBSITE	NicoJamin.com
TWITTER	@Nico_Jamin
FACEBOOK	Nico Jamin
STATUS	Current series points leader with five wins, five additional podium finishes and eight pole positions

ALLIED BUILDING PRODUCTS
GRAND PRIX OF TORONTO

FOLLOW ALL THE ACTION ON NBCSN, ROADTOINDY.TV AND THE NEW MAZDA ROAD TO INDY APP (LISTED AS "ROAD TO INDY"), AVAILABLE FREE ON THE APP STORE (iOS) AND GOOGLE PLAY (ANDROID) FOR MOBILE PHONES AND TABLETS.

NBCSN

THE MAZDA ROAD TO INDY | WHERE TOMORROW'S STARS RACE...TODAY!

WORDS Philip Royle
MAIN IMAGE Perry Bennett

STEP ONE

SCCA's Starting Line school is your first step into living that motorsports dream.

When it comes to motorsports, you're the next superstar, and you know it. The problem is, you have limited funding and absolutely no idea how to take that first step toward motorsports glory. Not surprisingly, you're not alone, so for people just like you, the Sports Car Club of America has launched its Tire Rack SCCA Starting Line schools to jumpstart enthusiasts into the world of amateur motorsports – and maybe even beyond.

The Starting Line program was born in 2013, explains SCCA's Director of Experiential Programs Heyward Wagner, because "it can be hard – often, too hard – to get started in motorsports. The Starting Line seeks to change that."

Ultimately, a Starting Line school lays the foundation for performance driving.

"Our instructors are just as happy to work with the guy in the station wagon as they are to jump into a Cayman S"

HEYWARD WAGNER

Students become SCCA members, get subscriptions to magazines, and receive a free entry into a Tire Rack National Solo Series event, SCCA's pinnacle autocross series that tours the U.S. and culminates in a winner-take-all championship.

On a more basic level, Wagner says, "there's also an option to add a Bell helmet to the Startling Line registration package, and all students are invited to take part in the next day's autocross alongside the school's instructors."

At a Starting Line school, you'll find you're surrounded by individuals just like you – automotive enthusiasts looking to better their skills behind the wheel, or maybe take that next step toward real motorsports competition. "Our instructors tailor the curriculum to the skill of the driver, and are just as happy to work with the guy in the station wagon as they are to jump into a Cayman S," says Wagner.

Little is needed to attend a Starting Line school, which typically takes place in a secure parking lot with plenty of room to keep things safe. Comfortable shoes, sunscreen, and just about any car you care to name – that makes up the entire list of things you need to bring. "We provide water, lunch, instruction, and Garmin VIRB

(LEFT and BELOW) Time behind the wheel on the autocross course is the core of a Starting Line school. (BOTTOM) After a short meeting and the distribution of helmets, it's time to get out there and drive. (BOTTOM LEFT) Thanks to Starting Line's knowledgeable instructors, all leave better for the experience.

Perry Bennett

Perry Bennett

Perry Bennett

cameras to capture your day," says Wagner.

"Our team absolutely loves bringing new people into the sport," he continues. "We want people to really understand the dynamics of their vehicle, how to utilize their vision, and how to find the limits of themselves and their car. We also want them to meet likeminded people, learn about the sport and its community, and know everything they need to know to get started in performance driving."

Starting Line schools take place all across America, nearly every month. Some 30 were held in 2015, with 35 more targeted for the coming year. "The website, **SCCAStartingLine.com**, lists all schools, as well as the 'Ultimate Autocross Guide,' which defines terms, answers questions and lets you check out videos," says Wagner.

For $325, students get in-car instruction and personalized, one-on-one time with SCCA members who are doing exactly what you're currently dreaming of. The first step in motorsports, even on the amateur level, can be overwhelming, but SCCA's Starting Line schools will help set you on the right path – and do so in as little as one day. ■

Perry Bennett

A STARTING LINE DAY

LEARNING IS FUN

"Expect to arrive at the Starting Line school no later than 7:30 a.m.," says Tire Rack SCCA Starting Line instructor Darren Seltzer (BELOW), who went from enthusiast, to SCCA National Championship autocrosser, to SCCA road racer in less than five years.

Once on site, the school begins with a technical safety inspection of the cars, which is handled by the Starting Line staff. Then, says Seltzer, starts the fun.

"After a quick morning meeting, we distribute helmets and get into the cars for the first exercises: slalom and skid oval," he says. "In the afternoon we set up a small autocross course where each student gets 12 runs. A wrap-up session at the end summarizes the day."

And don't fret about your prowess behind the wheel, or lack thereof, as Seltzer assures us the Starting Line school is specifically tailored to meet the needs of everyone from experienced autocrossers to first timers.

"Everyone will leave with greater car control and knowledge of basic car handling principles, which will help them at their next autocross or on the street," says Seltzer.

(TOP) Starting Line instructors can add to a driver's skill set, regardless of their pupil's prior talent and experience level.

STARTING LINE

HISTORIC SCENE

LAT archive

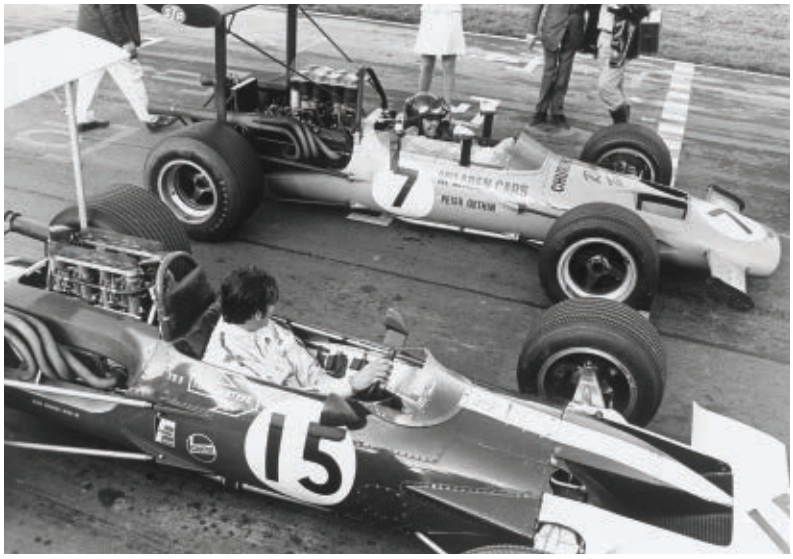
F5000 CARS **RUMBLING THE HILLSIDE**

The late lamented series that brought F1, Indy car and sports car stars together for nine glorious seasons will grab the spotlight once more

With a sound likely to shake the circuit's neighbors in Salinas and Carmel, the largest ever gathering of Formula 5000 cars will assemble at Mazda Raceway Laguna Seca for the Rolex Monterey Motorsports Reunion.

It's a historic occasion because, with 50 provisional entries, it's believed to be the largest ever grid of F5000 machinery that once united talents such as Mario Andretti, Al and Bobby Unser, Jody Scheckter, James Hunt, Sam Posey, Brian Redman and David Hobbs – and that was just in America's SCCA Continental Championship. The formula was such a hit that it took off in Europe and also Australia and New Zealand.

Look out for Mario Andretti's 1974 race-winning Lola T332-Chevrolet, as well as Tony Adamowicz in his 1969 Formula A title-winning Eagle Mk 5.



Formula 5000's popularity spread worldwide. Here's Peter Gethin in a McLaren M10A (No. 7) alongside the Surtees TS5 of David Hobbs at Mallory Park, UK.

Unforgettable finale, but Fuji '76 was more than just Hunt vs. Lauda. Mario Andretti scored Lotus's first win for two years, triggering a team revival that led to the marque's final World Championships in '78.

MASTERS MAGIC AT MONTEREY REUNION

A 35-car grid of Formula 1 classics from the '70s set to stun at Laguna Seca

From the successful and sublime to the obscure-for-good-reason, the Rolex Monterey Motorsports Reunion at Mazda Raceway Laguna Seca contains something for every type of racing enthusiast. But the Formula 1 lineup for 2015's Reunion will make adults eager to recapture their youth, and youths gaze in awe at the cars that used to comprise the sport's top echelon in its 3-liter era.

Run by Masters USA, the event has also attracted many European entries, with cars only being accepted on the basis of their authenticity, race provenance and period correctness.

Without question, one of the stars will be a Lotus 77 as raced by Mario Andretti to that tide-changing victory at Mt. Fuji in 1976, and driven at Monterey by owner Chris Locke. Another Colin Chapman brainchild (albeit less successful) sure to attract attention is Andrew Beaumont's ex-Ronnie Peterson Lotus 76/1, looking for all the world like a more angular Lotus 72.

Other mid-'70s cars will include a Ferrari 312T, McLaren M26, Wolf WR4, and the first-ever Arrows, the 001.

However, there will be earlier and later cars in action. For instance, the Tyrrell 002 in which the late Francois Cevert scored his only grand prix win at Watkins Glen in 1971 will share the grid with the Williams FW08C that Keke Rosberg used to dominate the 1983 Monaco Grand Prix and score the first of the Williams team's two wins in the French principality.

LAT archive

DEPAILLER'S FIRST WINNER

Speaking of Monaco, John Goodman will drive the handsome Tyrrell 008 in which street-specialist Patrick Depailler scored his first win in 1978 at his favorite track.

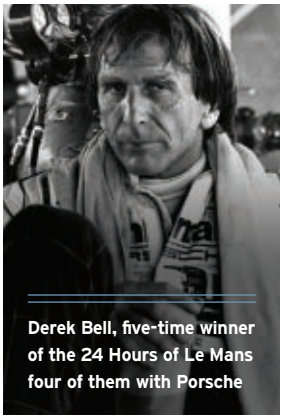
REUNION IN PARADISE

The Rolex Monterey Motorsports Reunion runs Aug. 13-16, with gates open at 7 a.m. For more ticket information, call (831) 242-8200. Free parking is available. For full details, go to **http://www.mazdaraceway.com/rolex-monterey-motorsports-reunion**

ROLEX MONTEREY MOTORSPORTS REUNION

PAYING HOMAGE TO AN AUTOMOTIVE ICON

The Shelby Mustang GT350, the first and most enduring performance variant of the original pony car, will be honored at the Rolex Monterey Motorsports Reunion. On the car's 50th anniversary and marking its three consecutive SCCA National Championships, there will be a special race group for the 1965-1972 GT350s, and Ford Motor Company will be building a special paddock display of legendary 'Stangs.



Derek Bell, five-time winner of the 24 Hours of Le Mans four of them with Porsche

RENNSPORT REUNION V PORSCHE SPICE

The chance to see a gathering from one of the automotive world's most hallowed brands at one of America's most loved race tracks is surely too good a chance to miss. The case gets stronger still in the year in which the Weissach marque captured its 17th 24 Hours of Le Mans victory.

On September 25-27, legendary figures from the company's history, such as Hurley Haywood, Derek Bell and Brian Redman, will be at Mazda Raceway Laguna Seca to help celebrate Porsche with like-minded devotees.

With races for everything from 550s to 962s, 911s to LMP2 Spyders, and all points in between and beyond, there will be no shortage of competition on track.

But it's the parades, hot laps, exhibition laps and activities and displays on the track's infield that also help to make this event so special and successful. Even if you're not yet a fan of Porsche, Rennsport V may convert you.

PORSCHE RENNSPORT REUNION V

GET ALL THE DETAILS

In true Porsche style, there is a dedicated website to Rennsport V. Just log on to **porscherennsportreunion.com**

HISTORIC SCENE

Randy Erdman

A pleasingly eclectic bunch of vintage racecars kept drivers and spectators entertained in Road America's HAWK International Challenge.

ROAD AMERICA **THE BEAUTIFUL**

The classic Elkhart Lake venue was a perfect setting for the 560-car HAWK International Challenge vintage event

Road America's HAWK International Challenge vintage event with Brian Redman was declared a success after three days of vintage racing action, exhibitions, concours awards and activities for fans. Driver and assistant competition director Dorsey Schroeder described it as "one of the most amazing events of its kind in the world."

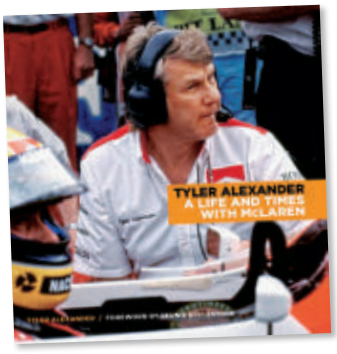
Schroeder went on: "This weekend is the perfect combination of a famous circuit, a gorgeous backdrop with the village of Elkhart Lake for the Friday and Saturday Nationwide Concourse d'Elegance, and beautiful mid-summer Wisconsin weather. Plus, we had a huge amount of cars and a special feature race to pay tribute to the Chevy V8 small block, which made it even better."

The cars, mostly driven by gentlemen drivers, amounted to some 560 entrants at the track, mixing with crowds of car lovers in the paddock area.

In the Masters USA Historic Grand Prix, Duncan Dayton's Lotus 79 held off Keith Fieser's '73 Shadow and James King's March 761, while another favorite category, that of Historic Can-Am, saw Rick Knoop's McLaren M8F beat a pair of Lolas – a T222 poloted by Claude Malette and the T70 of Toby Bean. However, Lolas reversed that trend in the Formula 5000 USA race, with Jay Esterer and Paul Zazryn scoring a 1-2 in their T332s, beating the '69 McLaren of Bruce Leeson.

Randy Erdman

SNAKES ALIVE! James French's Jordan 197 took honors in the race for Modern F1, Indy cars and WSP/GTP/LMP cars.



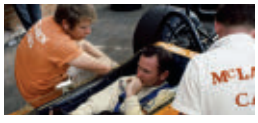
TYLER ALEXANDER – **A LIFE AND TIMES WITH McLAREN**

The long-anticipated book of a true insider at McLaren through many eras. And, yes, it lives up to our very high expectations

Tyler Alexander's life has been so packed that despite this autobiography containing 450 editorial pages, there are times when he really has to put the pedal to the metal to fit in all his work. However, he doesn't stick only to dry facts and stats: in fact, he's extremely candid with his opinions.

Tyler is most immediately associated with McLaren. He worked with its founder, Bruce, in the late '60s and only retired from the company in 2009, having formed close bonds with such as Peter Revson and Ayrton Senna. However, there's also great insight from his work with the Mayer Motor Racing Indy car team, FORCE/Haas F1 and his spell at Newman/Haas Racing.

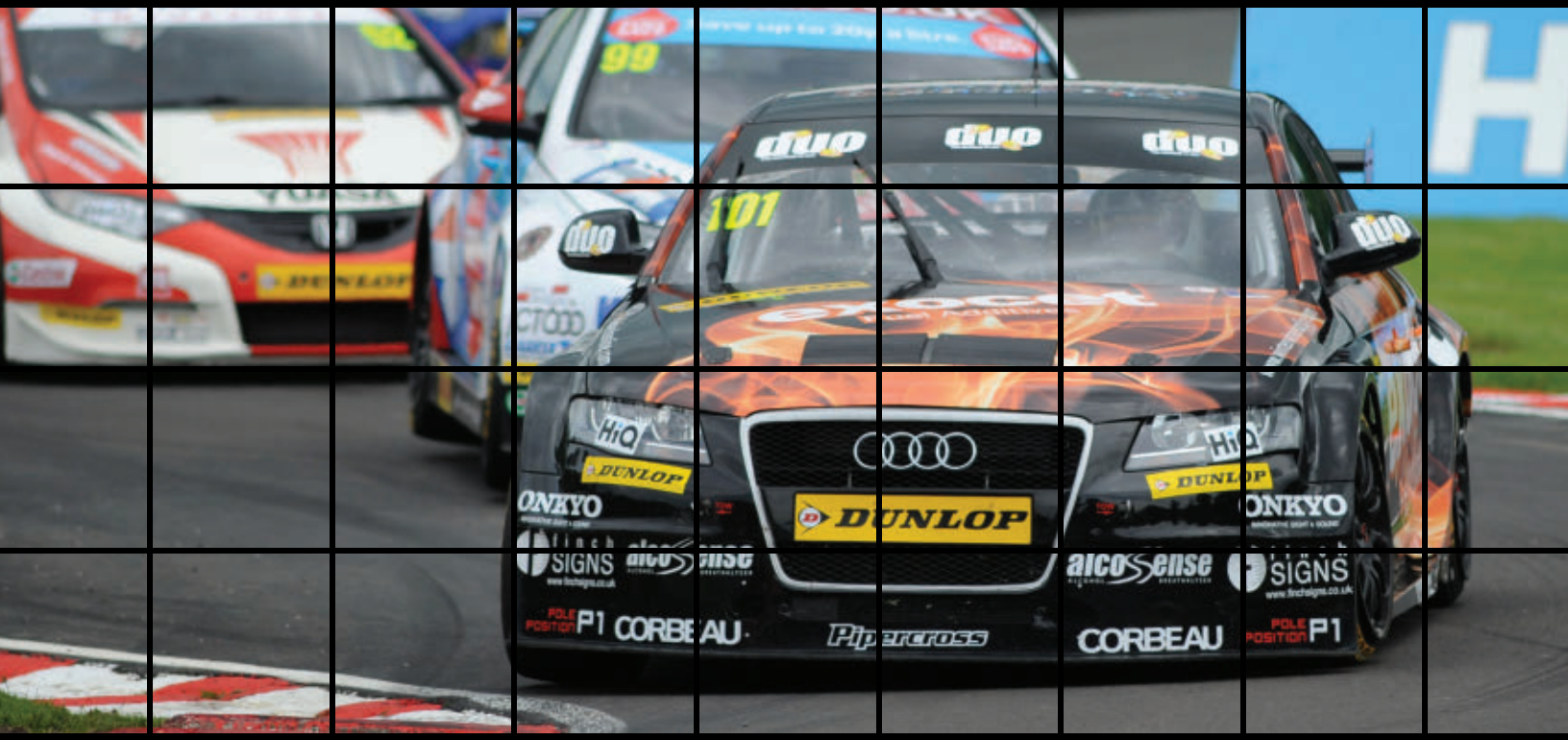
At $55.00, this book is great value. Find out more at **bullpublishing.com**



WITH THE BOSS Alexander's depiction of Bruce McLaren is of a smart, driven, yet kind man.

DRIVE IT.
RACE IT.
LIVE IT.

THE WORLD'S PREMIER DESTINATION FOR AUTOMOTIVE VIDEO CONTENT–MOTORSPORT, MOVIES, DOCUMENTARIES, ORIGINAL SERIES–AT YOUR FINGERTIPS.



MOTORTREND ON DEMAND

MOTORTRENDONDEMAND.COM

MAKING TRACKS

Skip Barber Racing School

Skip Barber Racing School's Karts to Cars Scholarship Shootout provides that crucial first taste of racecars for kart aces. This year it will be held at NOLA Motorsports Park.

"K2C": A PATH TO THE TOP

The Karts to Cars Scholarship aims to build on strong tradition for racing's big transition.

> Skip Barber Racing School's Karts to Cars Scholarship Shootout is a crucial marker in training kart racers in their quest to become professional racecar drivers. The Karts to Cars Scholarship, or "K2C" as it is commonly known, is a showcase for motorsports talent and has consistently produced successful racers and unleashed them onto the motorsports community.

This year, the Karts to Cars Scholarship Shootout will change locations from Sebring International Raceway to NOLA Motorsports Park, which hosted the second round of the 2015 IndyCar Series and is also a prominent karting arena.

Josef Newgarden, Ryan Hunter-Reay, and AJ Allmendinger are three examples of drivers who have gained that crucial early racecar training at the Skip Barber Racing School, and the Karts to Cars Scholarship Shootout has proven to be a key pathway for a karter moving to the upper echelons of racing.

Karts to Cars Scholarship Shootout: Oct. 26-28, at NOLA Motorsports Park

Minimum eligibility:

1. Current outdoor karting experience.
2. One Skip Barber 3-Day Racing School.

Maximum eligibility:

1. No professional racing experience.
2. Maximum of two race weekends in the Skip Barber Race Series.
3. Participants must be at least 13.
4. Maximum of 12 Advanced Activity days between 2014 and 2015 K2C Shootouts. These include Lapping Days in SBRS, 2-Day Advanced Racing School and Advanced Car Control.

Karters interested in the program, can learn more at **http://skipbarber.com/karts-to-cars-scholarship-shootout/**

"K2C" is the largest and most important event for karters transitioning into racecars and proves the motorsport ecosystem continues to thrive in North America. Skip Barber Racing School's time-tested model has allowed a standard way for racers to get their foot in the door. With equal cars meticulously tested by instructors to ensure no driver has an unfair advantage, talent reigns supreme in the Skip Barber Racing School system.

Aggressive global recruitment ensures the 2015 K2C Scholarship Shootout will be hugely competitive, and the goal is simple: Skip Barber Racing School wants the best talent to get the best training.

"We take pride in being the gateway to motorsports," says Director of Competition, Casey Carden, "and we want this class of Karts to Cars Scholarship participants to be the best around. These kids will be the next drivers in Formula 1, IndyCar and the TUDOR Championship.

"This shootout encompasses both on- and off-track activities that provide young drivers making the transition from karts to cars with the tools to succeed. Win, lose or draw, competitors gain information and experience in the Shootout that they will use for the rest of their career."

By Debbie Ebalobo

ABOVE: Daniel De La Calle (RIGHT) won last year's Kart to Cars Scholarship, and is using his $40,000 credit to race in the SBRS Summer Series.

HIGH GRADES FOR GRADS

For the second year in a row at Iowa Speedway, IndyCar aces Ryan Hunter-Reay (RIGHT) and Josef Newgarden made it a 1-2 for Skip Barber Racing School graduates, but this time IndyCar rookie Sage Karam completed an SBRS 1-2-3. And of course, season-long points leader Juan Pablo Montoya is another Skip Barber grad...

Scott R LePage/LAT

BR DESIGN

NOW HIRING! We are looking for qualified, highly motivated individuals, who can work creatively and foster a collaborative team atmosphere, while delivering on tight deadlines and remaining calm in high pressure situations. All posted positions will be based at our facility in Indianapolis Indiana. If you are interested in applying for any of these positions, please send your resume/CV to **awilson@nissanlmp1.com**

Immigration status allowing the candidate to work in the USA, and the ability to travel frequently and have an unrestricted passport to comply with the venues on the WEC calendar are essential for all positions.

Candidates must also be well-organized, with excellent communication skills and meticulous attention to detail in all areas associated with the position applied for.

Sub Assembly Technician: Requires at least 5 years of experience with assembling uprights, steering racks, oil pumps, suspension, brakes & complex assemblies generally used for racing.

Chassis Mechanic: Requires a minimum of 5 years experience, position assists in rebuilding the race car after each event. The main tasks in this position are to set down the car after each session or race, strip the car, change engines, crack check components, rebuild components, maintenance on the fuel cell, rebuild the car, work to a life cycle for the components and generally make sure the car is reliable and working to its maximum mechanical ability. This employee may also be required to participate in pit stops.

Carbon Fiber Repair Specialist: This position will require the applicant to have knowledge in trimming, laminating, curing and finishing carbon fiber components. This individual will also be required to have experience in repairing crashed or broken parts of the race car in a timely manner.

Car Refueler: Must have experience refueling cars both in pit stops and during test and practice sessions. Person must also occasionally travel to our workshop to prepare/ upgrade equipment as required. This person should possess other qualities that would be useful in additional areas within the race team and can be utilized in-between sessions.

Assistant Race and Data Engineer: Responsibilities: Work with Race Engineer, supporting activities including: performance analysis, pre-race strategy analysis, data reduction and reporting

- Work with electronics department to communicate requests and implement software/hardware updates
- Develop analysis and strategy tools
- Generate post-race reports for items such as refueling and pit stop timing
- Ensure and maintain quality of sensors and sensor calibrations on car before and during tests and races
- Ensure data is downloaded from the car onto the server in a timely and efficient manor

Gearbox Design/Development Engineer: Responsibilities: Create engineering designs and drawings for gearbox, driveline and related items

- Create documentation in support of gearbox and driveline engineering work, e.g. build manuals, technical update documents, and test reports, etc.
- Support build department as required to ensure repeatable, reliable, build quality
- Improve and develop gearbox performance, through appropriate engineering testing methods, and update designs as required
- Effectively communicate timelines with Engineering, Production, and Build departments for updates and part supply in support of greater team plans

Design Engineer: Responsibilities: Create part and assembly designs that are well engineered, well considered, and fit for purpose

- Create detailed drawings of parts and assemblies for manufacture and assembly
- Create supporting build documentation as required
- Communicate with the rest of the engineering group to ensure fitment, suitability, and take design feedback into consideration
- Communicate effectively with Production and Build, on timelines, manufacturing methods, and concerns

Electronics Department Manager: Responsibilities: Manage lines of communication between electronics and other departments within the team, as well as external vendors

- Guide and direct electronics system architecture and design choices
- Ensure electronics inventory and production are aligned with requirements
- Ensure soft and hardware updates are prepared and tested in concert with the preparation and running of cars
- Assist in problem identification and remediation
- Set priorities for department members in line with team priorities

Structural Analysis Engineer: Responsibilities: Performing Finite Element Analysis on composite and homogeneous parts

- Implicit analysis required; Explicit analysis desirable
- Provide feedback of results and recommendations to design department in a timely manor
- Be able to do detailed hand calculations to "sanity check" results
- Recommend, support and/or perform physical testing, where required to validate analysis results

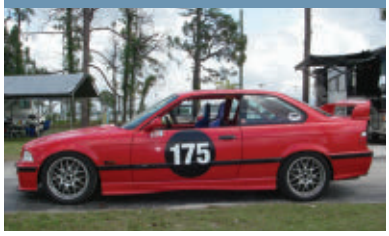
IT: Responsibilities: Support and improve computer networks and file sharing at the track and shop

- Implement and maintain file control for CAD software
- Support TV, radio, and timing stand electronics at the track
- Maintain team computer soft and hardware, as well as managing relationships with suppliers

US Based Logistics Coordinator / Truckie: This applicant must hold a clean U.S. CDL and have experience as a race team truckie for at least 5 years. The position will be responsible for driving the truck to all of our U.S. based tests and our race at COTA. While at the racetrack for tests, the truckie will coordinate the garage set up with the rest of our crew, be responsible for tire management (pressures, inspections and heaters), be responsible for the loading/unloading of the truck and general maintenance of the truck, trailer and pit equipment. This applicant must have immaculate attention to detail and enjoy working with others as part of a team. Pit stop experience is preferred.

Florida. OBD1 converted S52 "New" used engine, 3.73:1 limited slip, 6 puck ceramic clutch kit, KONI double adjustable shocks, camber/caster plates, roll cage w/ NASCAR bars, much more. $18,000. **Contact: Mike (407) 551-2567 or dmikem@earthlink.net** – More info & pictures available.

'95 BMW M3 RACECAR



GTM VOLVO P1800

Tube chassis, B23 turbo, fuel injected, SDS engine mgmt., 3-disc clutch, Sanez 5-speed trans., Speedway Super Max QC, 2250lbs, only 2 races. Twins on way so must sell. $38,000. **Email: contreiras@shaw.ca or call (604) 526-5519**.

Racecar with spares and tools, complete package. Spare ZZ4 engine, trans, gears, radiators (2), oil pan, brake calipers, hubs, scales, new seatbelts and helmet fresh air system. Upgraded 2004 nose, new paint, spare rims. Capable of 160mph. Track-ready. Very reliable, super-fast and fun. Absolutely no issues. Asking $25,000. **Call: Brian at (336) 655-6833**.

1999 TOWNSEND PRO TRUCK

MAZDA RX-7 GTU 1990

Chip Foose autographed. SCCA and NASA. GT2. Custom tube frame, fiberglass body. Restored in 2015. 13B peripheral port dry sump motor, Weber 51, spare slide injection. New Saenz 5-speed. 9" Ford rear-end & axles, third-member assembly. Wilwood brakes. 12 wheels with tires. **Contact: Angel Clemente (787) 531-4445 or autologiccorp@gmail.com.**

3 National Championships with 3 different drivers. You could be next! 2 spare AVP engines available, plus many more spares. Can run F Production or GTL. **Call: John at (918) 633-9531**. Cars -- $35,000 EACH.

2014 F PRODUCTION MG MIDGETS

1999 MAZDA MIATA

Car placed 5th for SMT and 1st for ITS (SCCA). Won class in the four hour RDC Enduro. Has a freshened engine and 2015 technical inspections for SCCA and NASA. Car has top-end racing equipment and hard top. **Contact: Ted May at (408) 297-1990 or valayauto@gmail.com**.

The very last one built in spectacular unrestored condition. Mk9b drivers included Johncock, Rutherford, Ganassi and Ongais. Sold less Cosworth DFX; however, engines available. Asking $29,997. **Contact: Morris Pagni @ (484) 357-6266 or Email: mspagni@me.com**.

1983 PATRICK WILDCAT MK9B

DSR P2

Converted from Lola 540. Fitted with a GSX-R 1000 engine and Quaife limited slip differential. Spare engine with throttle bodies and harness. Spare suspension, uprights, sprockets, brake calipers and springs. Includes 1994 tow vehicle and 20' enclosed trailer. All for $19,950. **Contact: Roy Maxwell at (214) 232-5095 or (817) 429-2015**.

Chassis 2595. All wide track. Zetec motor. New Aim EV04. Pennon diffuser. Penske 8760s. Bosch fuel pump. Log book. $42,900 obo. **Contact: Tony Smith (920) 210-2169**.

RF 99 ZETEC

1989 PORSCHE 944 TURBO CUP REPLICA

Recent full rebuild of entire car including engine & trans. 3 sets of 18" wheels and comprehensive spares package. Many class wins in PCA. Full build details and spare list available. $20k for full package. **Contact: Brian at (386) 631-5051 or xupkid2@hotmail.com**.

Square tube chassis, Lotus link, new Rebello KA24 3-Valve motor, 32mm SIR. Completely sorted to position you to win the 2015 Runoffs. $58,500 w/2 motors, 12 wheels, plus more. Spec sheet and photos available. **Contact: Chuck McKinney at (510) 812-1140 or chuck@amtmetals.com**.

2014 RUNOFFS PODIUM-FINISHING GT-3 NISSAN 240SX

ASTRA F1000 FB #13

Looks like new condition, very little use, Suzuki 08 1000 RLC Microdata dash, Flatshifter Expert Quickshifter, extra set of wheels and tires, Designed Vinyl Wrap, Schroth Indy belts, lightweight fire system, gear position indicator, bead seat. $42,500 ono. **Contact: Richard at (303) 350-6066 or speedyrill@aol.com**.

DIARY
AUGUST 2015


Scott LePage/LAT

After a 2h40m-long sprint and tactical game in the TUDOR Championship round at Canadian Tire Motorsport Park, there was less than a half-second between winner Jordan Taylor and runner-up Dane Cameron.


Andrew Ferraro/LAT

DELIVERING AS PROMISED

The Mercedes team's domination makes F1 a tough sell in some places, but it's no problem in the UK. A crowd estimated at 140,000 watched national hero Lewis Hamilton continue his *mano e mano* title battle with teammate Nico Rosberg, and turn in a picture-perfect drive.

With his third British Grand Prix win, Hamilton needs one more to draw level with Nigel Mansell (who also won a European GP in Britain) and two more to match Jim Clark and Alain Prost.

F1 WORLD CHAMPIONSHIP

March 15	Australia	Lewis Hamilton
March 29	Malaysia	Lewis Hamilton
April 12	China	Sebastian Vettel
April 19	Bahrain	Lewis Hamilton
May 10	Spain	Nico Rosberg
May 24	Monaco	Nico Rosberg
June 7	Canada	Lewis Hamilton
June 21	Austria	Nico Rosberg
July 5	Britain	Lewis Hamilton
July 26	Hungary	Sebastian Vettel
Aug. 23	Belgium (Spa)	
Sept. 6	Italy (Monza)	
Sept. 20	Singapore (Marina Bay)	
Sept. 27	Japan (Suzuka)	
Oct. 11	Russia (Sochi)	
Oct. 25	United States (COTA)	
Nov. 1	Mexico (Mexico City)	
Nov. 15	Brazil (Interlagos)	
Nov. 29	Abu Dhabi (Yas Marina)	

VERIZON INDYCAR SERIES

March 29	St. Petersburg	Juan Montoya
April 12	NOLA	James Hinchcliffe
April 19	Long Beach	Scott Dixon
April 26	Barber	Josef Newgarden
May 9	Indianapolis GP	Will Power
May 25	Indy 500	Juan Montoya
May 30	Detroit 1	Carlos Munoz
May 31	Detroit 2	Sebastien Bourdais
June 6	Texas	Scott Dixon
June 14	Toronto	Josef Newgarden
June 27	Fontana	Graham Rahal
July 12	Milwaukee	Sebastien Bourdais
July 18	Iowa	Ryan Hunter-Reay
Aug. 2	Mid-Ohio, Lexington, Ohio	
Aug. 23	Pocono, Pa.	
Aug. 30	Sonoma, Calif.	

IMSA TUDOR UNITED SPORTSCAR CHAMPIONSHIP

Jan. 24-25	Daytona	S. Dixon/T. Kanaan/ K. Larson/J. McMurray
March 21	Sebring	J. Barbosa/S. Bourdais/ C. Fittipaldi
April 18	Long Beach	J. Taylor/R. Taylor
May 3	Laguna Seca	Westbrook/Valiante
May 30	Detroit	Cameron/Curran
June 28	Watkins Glen	Westbrook/Valiante
July 12	Mosport	J. Taylor/R. Taylor
July 25	Lime Rock	Guasch/Kimber-Smith
Aug. 9	Road America, Elkhart Lake, Wis.	
Aug. 23	VIR, Alton, Va.	
Sept. 19	COTA, Austin, Texas	
Oct. 3	Road Atlanta, Ga. (1000m/10hrs)	

NASCAR SPRINT CUP SERIES

Feb. 22	Daytona 500	Joey Logano
March 1	Atlanta	Jimmie Johnson
March 8	Las Vegas	Kevin Harvick
March 15	Phoenix	Kevin Harvick
March 22	Fontana	Brad Keselowski
March 29	Martinsville	Denny Hamlin
April 11	Texas	Jimmie Johnson
April 19	Bristol	Matt Kenseth
April 26	Richmond	Kurt Busch
May 3	Talladega	Dale Earnhardt Jr.
May 9	Kansas	Jimmie Johnson
May 24	Charlotte	Carl Edwards
May 31	Dover	Jimmie Johnson
June 7	Pocono	Martin Truex
June 14	Michigan	Kurt Busch
June 28	Sonoma	Kyle Busch
July 5	Daytona	Dale Earnhardt Jr.
July 11	Kentucky	Kyle Busch
July 19	Loudon	Kyle Busch
July 26	Indianapolis	Kyle Busch
Aug. 2	Pocono, Pa.	
Aug. 9	Watkins Glen, N.Y.	
Aug. 16	Brooklyn, Mich.	
Aug. 22	Bristol, Tenn.	
Sept. 6	Darlington, S.C.	
Sept. 12	Richmond, Va.	
Sept. 20	Chicagoland, Ill.	
Sept. 27	Loudon, N.H.	
Oct. 4	Dover, Del.	
Oct. 10	Charlotte, N.C.	
Oct. 18	Kansas City, Kan.	
Oct. 25	Talladega, Ala.	
Nov. 1	Martinsville, Va.	
Nov. 8	Fort Worth, Texas	
Nov. 15	Phoenix, Ariz.	
Nov. 22	Homestead, Fla.	

NASCAR XFINITY SERIES

Feb. 21	Daytona	Ryan Reed
Feb. 28	Atlanta	Kevin Harvick
March 7	Las Vegas	Austin Dillon
March 14	Phoenix	Joey Logano
March 21	Fontana	Kevin Harvick

FEATURE RACE

GOPRO GP OF SONOMA

WHEN **August 30**
WHERE **Sonoma, Calif.**

Double points, season finale...it raises the stakes for Sonoma's typical first-lap chaos.

TICKET INFO

Order race tickets directly at **racesonoma.com**

WHERE & HOW

San Francisco-close, Sonoma's wine country can be the epicenter of a dream vacation

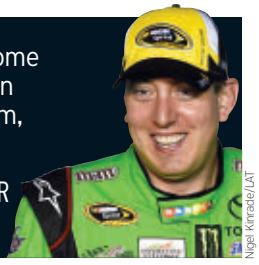
TREADING LIGHTLY

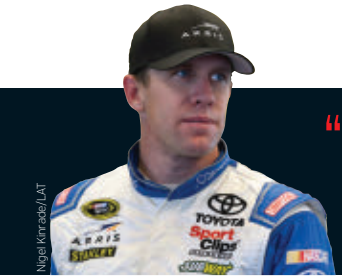
Sebastien Bourdais' spanking of the IndyCar field at Milwaukee came with a $5,000 fine after his car was found to be 3lbs under the weight limit. His KVSH team blamed the celebratory donuts.


Chris Owens/IndyCar

"If somebody had said I was going to come back after my wreck and injury and win four out of five races, I'd have told them, 'Yeah, right, you're crazy'"

KYLE BUSCH keeps on winning. Will NASCAR even *need* to grant him a Chase waiver?


Nigel Kinrade/LAT



Nigel Kinrade/LAT

"We're talking a nine-inch spoiler and that's huge. That thing's going to be pushing a boulder through the air"
CARL EDWARDS on NASCAR's efforts to spice up the Brickyard 400 via a new aero package

NHRA

Norwalk featured the third all-female pro final round in NHRA history, as Karen Stoffer defeated Angelle Sampey to take the Pro Stock Motorcycle win.

April 10	Texas	Erik Jones
April 18	Bristol	Joey Logano
April 24	Richmond	Denny Hamlin
May 2	Talladega	Joey Logano
May 17	Iowa	Chris Buescher
May 23	Charlotte	Austin Dillon
May 30	Dover	Chris Buescher
June 13	Michigan	Kyle Busch
June 20	Chicagoland	Erik Jones
July 4	Daytona	Austin Dillon
July 10	Kentucky	Brad Keselowski
July 18	Loudon	Denny Hamlin
July 25	Indianapolis	Kyle Busch
Aug. 1	Newton, Iowa	
Aug. 8	Watkins Glen, N.Y.	
Aug. 15	Mid-Ohio, Lexington, Ohio	
Aug. 21	Bristol, Tenn.	
Aug. 29	Elkhart Lake, Wis.	
Aug. 30	Atlanta, Ga.	
Sept. 5	Darlington, S.C.	
Sept. 11	Richmond, Va.	
Sept. 19	Chicagoland, Ill.	
Sept. 26	Sparta, Ky.	
Oct. 3	Dover, Del.	
Oct. 9	Charlotte, N.C.	
Oct. 17	Kansas City, Kan.	
Nov. 7	Fort Worth, Texas	
Nov. 14	Phoenix, Ariz.	
Nov. 15	Homestead, Fla.	

NASCAR CAMPING WORLD TRUCK SERIES

Feb. 20	Daytona	Tyler Reddick
Feb. 28	Atlanta	Matt Crafton
March 28	Martinsville	Joey Logano
May 8	Kansas	Matt Crafton
May 15	Charlotte	Kasey Kahne
May 29	Dover	Tyler Reddick
June 5	Texas	Matt Crafton
June 13	Madison	Cole Custer
July 9	Kentucky	Matt Crafton
July 22	Eldora	Christopher Bell
Aug. 1	Pocono, Pa.	
Aug. 15	Brooklyn, Mich.	
Aug. 19	Bristol, Tenn.	
Aug. 30	CTMP, Bowmanville, Ontario	
Sept. 18	Chicagoland, Ill.	
Sept. 26	Loudon, N.H.	
Oct. 3	Las Vegas, Nev.	
Oct. 24	Talladega, Ala.	
Oct. 31	Martinsville, Va.	
Nov. 6	Fort Worth, Texas	
Nov. 13	Phoenix, Ariz.	
Nov. 20	Homestead, Fla.	

DELAYED GRATIFICATION

Weather forced cancellation of the second Pirelli World Challenge race at Detroit's Belle Isle, but Chris Dyson then swept to his first series victory for Bentley in the second of Road America's three GT races.

Brian Cleary/LAT

McKlein/LAT

FEATURE RACE

RALLY GERMANY

WHEN August 20-23
WHERE Trier, Germany

August is the perfect month for a racer's tour of Germany, with the WRC and WEC both in action there on successive weeks.

TICKET INFO

Order rally passes directly at **rallye-deutschland.de**

WHERE & HOW

Picturesque Trier is a snap to get to by car or train from Frankfurt. The all-asphalt stages wind through Germany's wine country.

FIA WORLD ENDURANCE CHAMPIONSHIP

April 12	Silverstone	B. Treluyer/Marcel Fassler/A. Lotterer
May 2	Spa	B. Treluyer/Marcel Fassler/A. Lotterer
June 13-14	Le Mans	E. Bamber/ N.Hulkenberg/N. Tandy
Aug. 30	Nurburgring, Germany	
Sept. 19	COTA, Austin, Texas	
Oct. 11	Fuji, Japan	
Nov. 1	Shanghai, China	
Nov. 21	Sakhir, Bahrain	

FIA WORLD RALLY CHAMPIONSHIP

Jan. 25	Monte Carlo	Sebastien Ogier
Feb. 15	Sweden	Sebastien Ogier
March 8	Mexico	Sebastien Ogier
April 23-26	Argentina	Kris Meeke
May 21-24	Portugal	Jari-Matti Latvala
June 11-14	Italy (Sardinia)	Sebastien Ogier
July 2-5	Poland	Sebastien Ogier
Aug. 1-2	Finland	
Aug. 20-23	Germany	
Sept. 10-13	Australia	
Oct. 1-4	France (Corsica)	
Oct. 22-25	Spain	
Nov. 12-15	Britain (Wales)	

PIRELLI WORLD CHALLENGE

March 6-8	COTA, Austin, Texas (GT, TC)*
March 27-29	St. Petersburg, Fla. (GT)*
April 17-19	Long Beach, Calif. (GT)
April 24-26	Barber, Birmingham, Ala. (GT)*
May 15-17	CTMP, Bowmanville, Ont. (TC)**
May 29-31	Detroit, Mich. (GT)
June 26-28	Elkhart Lake, Wis. (GT, TC)**
Jul 31-Aug. 2	Mid-Ohio, Ohio (GT)*
Aug. 14-16	Mid-Ohio, Ohio (TC)*
Aug. 21-23	Miller Park, Tooele, Utah (GT, TC)*
Aug. 28-30	Sonoma, Calif. (GT)*
Sept. 11-13	Monterey, Calif. (GT, TC)*

* double-header event ** triple-header event

NHRA MELLO YELLO SERIES

Feb. 8	Pomona, Calif.
Feb. 22	Phoenix, Ariz.
March 15	Gainesville, Fla. (PSM)
March 29	Charlotte, N.C. (PSM)
April 12	Las Vegas, Nev.

GRABBING A SLICE

Indy Lights veteran Felix Serralles scored his first victory in three seasons with a late pass of leader RC Enerson at Milwaukee. "The car was sliding all over the place, but I wanted that win so bad," he recounted.

IMS Photography

April 26	Houston, Texas
May 17	Atlanta, Ga. (PSM)
May 24	Topeka, Kan.
June 7	Englishtown, N.J. (PSM)
June 14	Epping, N.H. (PSM)
June 21	Bristol, Tenn.
July 5	Norwalk, Ohio (PSM)
July 12	Chicago, Ill. (PSM)
July 26	Denver, Colo. (PSM)
Aug. 2	Sonoma, Calif. (PSM)
Aug. 9	Seattle, Wash.
Aug. 23	Brainerd, Minn.
Sept. 7	Indianapolis, Ind. (PSM)
Sept. 20	Charlotte, N.C. (PSM)
Sept. 27	Madison, Ill. (PSM)
Oct. 4	Reading, Pa. (PSM)
Oct. 18	Dallas, Texas (PSM)
Nov. 1	Las Vegas, Nev. (PSM)
Nov. 15	Pomona, Calif. (PSM)

COOPER TIRES INDY LIGHTS CHAMPIONSHIP

Mar. 28-29	St. Petersburg 1&2	Ed Jones
April 19	Long Beach	Ed Jones
April 25-26	Barber 1&2	Spencer Pigot
May 8	Indianapolis (road) 1	Jack Harvey
May 9	Indianapolis (road) 2	Sean Rayhall
May 22	Indianapolis (oval)	Jack Harvey
June 13	Toronto 1&2	Spencer Pigot
July 12	Milwaukee	Felix Serralles
July 18	Iowa	Max Chilton
Aug. 1-2	Mid-Ohio, Lexington, Ohio 1&2	
Sept. 12-13	Monterey, Calif. 1&2	

PRO MAZDA CHAMPIONSHIP

Mar. 28-29	St. Petersburg 1&2	Neil Alberico
April 12	NOLA	Santiago Urrutia
April 25	Barber 1	Weiron Tan
April 26	Barber 2	Neil Alberico
May 7	Indianapolis (road) 1	Weiron Tan
May 8	Indianapolis (road) 2	Timothe Buret
May 9	Indianapolis (road) 3	S. Urrutia
May 23	Indianapolis (LORP)	Weiron Tan
June 13	Toronto 1	Florian Latorre
June 14	Toronto 2	Garett Grist
July 18	Iowa	Weiron Tan
Aug. 1-2	Mid-Ohio, Lexington, Ohio 1&2	
Sept. 12-13	Monterey, Calif. 1&2	

USF2000 CHAMPIONSHIP

Mar. 28-29	St. Petersburg 1&2	Jake Eidson
April 11	NOLA 1	Nico Jamin
April 12	NOLA 2	V. Franzoni
April 24	Barber 1	Aaron Telitz
April 25	Barber 2	Nico Jamin
May 8-9	Indianapolis (road) 1&2	Nico Jamin
May 23	Indianapolis (LORP)	Jake Eidson
June 13	Toronto 1	Jake Eidson
June 14	Toronto 2	Nico Jamin
Aug. 1-2	Mid-Ohio, Lexington, Ohio 1,2,3	
Sept. 12-13	Monterey, Calif. 1&2	

RACER.com

RACER.com has the latest racing news, views and features, plus Robin Miller's answers to your questions. Write to **MillersMailbag@racer.com**

TV & DIGEST
AUGUST 2015


Scott LePage/LAT

Remember, NBCSN is now the home for NASCAR Sprint Cup and Xfinity Series action. Practice and qualifying shows were mostly unset at press time so check RACER.com/TV for the latest air times.

August 23
ABC SUPPLY 500

After the drama and controversy at Fontana, the second 500-mile race of the Verizon IndyCar Series, a lot will be riding on the third leg of the Triple Crown – the series' third modern-era visit to the unique Pocono tri-oval.

Amid the weird synergy of American Pharoah becoming horse racing's first Triple Crown winner since 1978 – also the year that Al Unser scored Indy car racing's only 500-miler trifecta to date – many wondered if Juan Pablo Montoya could be poised for a similar feat, but Graham Rahal took care of that at Fontana. Yet the race could still be key to determining both Montoya's title hopes and IndyCar's future at Pocono.

DETAILS

2:00pm NBCSN: ABC Supply 500, Pocono, Pa. (L)


Michael Levitt/LAT

ALL TIMES ARE EASTERN (ET); ALWAYS CHECK LOCAL LISTINGS FOR LATEST AIR TIMES

SATURDAY, AUGUST 8

3:00pm NBCSN: NASCAR Xfinity Series, Watkins Glen, N.Y. (L)
11:00pm ESPN2: NHRA Mello Yello Drag Racing qualifying, Seattle, Wash. (SDD)

SUNDAY, AUGUST 9

10:00am FS1: MotoGP qualifying, Indianapolis, Ind. (L)
12:00pm FS1: MotoGP Moto3, Indianapolis, Ind. (L)
1:00pm FS1: MotoGP Moto2, Indianapolis, Ind. (L)
2:00pm FS1: MotoGP, Indianapolis, Ind. (L)
2:00pm NBCSN: NASCAR Sprint Cup Series, Watkins Glen, N.Y. (L)
3:00pm FS1: IMSA TUDOR United SportsCar Championship, Elkhart Lake, Wis. (L)
4:00pm CBSSN: Pirelli World Challenge, GT, Lexington, Ohio (D)
9:00pm ESPN2: NHRA Mello Yello Drag Racing, Seattle, Wash. (SDD)

WEDNESDAY, AUGUST 12

9:00pm CBSSN: Pirelli World Challenge, GTS, Lexington, Ohio (D)

FRIDAY, AUGUST 14

4:30pm NBCSN: NASCAR Sprint Cup Series qualifying, Brooklyn, Mich. (L)

SATURDAY, AUGUST 15

9:30am FS1: NASCAR Camping World Truck Series qualifying, Brooklyn, Mich. (L)
9:30am NBCSN: NASCAR Xfinity Series qualifying, Lexington, Ohio (L)
1:00pm FS1: NASCAR Camping World Truck Series, Brooklyn, Mich. (L)
3:00pm NBC: Red Bull Global Rallycross, Washington, D.C. (L)
3:30pm NBCSN: NASCAR Xfinity Series, Lexington, Ohio (L)

SUNDAY, AUGUST 16

7:30am FS1: MotoGP, Brno, Czech Republic (L)
2:30pm NBCSN: NASCAR Sprint Cup Series, Brooklyn, Mich. (L)

8:00PM FOX SPORTS 1, AUG. 17
IMSA Continental Tire Challenge

An unusual Monday night in prime time for IMSA's second-tier series' round at Road America.


Scott LePage/LAT

WEDNESDAY, AUGUST 19

3:00pm NBCSN: Red Bull Global Rallycross, GRC Lites, Washington, D.C. (D)
8:30pm FS1: NASCAR Camping World Truck Series, Bristol, Tenn. (L)

FRIDAY, AUGUST 21

7:30am NBCSN: Formula 1 Belgian Grand Prix practice, Spa (L)
3:30pm NBCSN: NASCAR Xfinity Series qualifying, Bristol, Tenn. (L)
5:30pm NBCSN: NASCAR Sprint Cup Series qualifying, Bristol, Tenn. (L)
7:30pm NBCSN: NASCAR Xfinity Series, Bristol, Tenn. (L)

SATURDAY, AUGUST 22

7:30am NBCSN: Formula 1 Belgian Grand Prix qualifying, Spa (L)
7:30pm NBCSN: NASCAR Sprint Cup Series, Bristol, Tenn. (L)
11:00pm ESPN2: NHRA Mello Yello Drag Racing qualifying, Brainerd, Minn. (SDD)

SUNDAY, AUGUST 23

7:30am NBCSN: Formula 1 Belgian Grand Prix, Spa (L)
1:00pm FS1: IMSA TUDOR United SportsCar Championship, Danville, Va. (L)
9:00pm ESPN2: NHRA Mello Yello Drag Racing, Brainerd, Minn. (SDD)

SATURDAY, AUGUST 29

12:00pm CBSSN: Trans Am Series, TA, TA3 Lexington, Ohio (D)
3:00pm NBCSN: NASCAR Xfinity Series, Elkhart Lake, Wis. (L)

SUNDAY, AUGUST 30

7:30am FS1: MotoGP, Silverstone, UK (L)

9:00AM FOX SPORTS 1, AUG. 30
World Endurance Championship

The WEC's long post-Le Mans layoff ends at one of Germany's classic venues – Nurburgring.


Jakob Ebrey/LAT

1:30pm FS1: NASCAR Camping World Truck Series, Bowmanville, Ontario, Canada (L)
4:00pm NBCSN: Verizon IndyCar Series, Sonoma, Calif. (L)
4:00pm CBSSN: Pirelli World Challenge, GT, Tooele, Utah (D)

WEDNESDAY, SEPTEMBER 2

8:00pm CBSSN: Pirelli World Challenge, TC, Tooele, Utah (D)


NHRA

After many years on ESPN and ESPN2, the NHRA is moving to FOX Sports for 2016. Sweetening the multi-year deal for fans will be significant increases in the amount of live coverage of final eliminations.

FRIDAY, SEPTEMBER 4

7:30am	NBCSN: Formula 1 Italian Grand Prix practice, Monza (L)

SATURDAY, SEPTEMBER 5

7:30am	NBCSN: Formula 1 Italian Grand Prix qualifying, Monza (L)
10:00am	CBSSN: Trans Am Series, TA2, Lexington, Ohio (D)
3:30pm	NBCSN: NASCAR Xfinity Series, Darlington, S.C. (L)

SUNDAY, SEPTEMBER 6

7:30am	NBCSN: Formula 1 Italian Grand Prix, Monza (L)
9:00am	FS1: IMSA Continental Tire Challenge Series, Danville, Va. (D)
11:00am	ESPN: NHRA Mello Yello Drag Racing qualifying part 1, Indianapolis, Ind. (L)
5:00pm	CBSSN: Pirelli World Challenge, GT, Sonoma, Calif. (D)
7:00pm	NBCSN: NASCAR Sprint Cup Series, Darlington, S.C. (L)
11:00pm	ESPN2: NHRA Mello Yello Drag Racing qualifying part 2, Indianapolis, Ind. (SDD)

MONDAY, SEPTEMBER 7

4:00pm	ESPN: NHRA Mello Yello Drag Racing, Indianapolis, Ind. (L)

WEDNESDAY, SEPTEMBER 9

8:00pm	CBSSN: Pirelli World Challenge, TC, Sonoma, Calif. (D)

FRIDAY, SEPTEMBER 11

7:30pm	NBCSN: NASCAR Xfinity Series, Richmond, Va. (L)

SATURDAY, SEPTEMBER 12

10:00am	CBSSN: Trans Am Series, Elkhart Lake, Wis. (D)
4:00pm	NBC: Red Bull Global Rallycross, race 1, Los Angeles, Calif. (L)
7:30pm	NBCSN: NASCAR Sprint Cup Series, Richmond, Va. (L)

SUNDAY, SEPTEMBER 13

4:00pm	NBC: Red Bull Global Rallycross, race 2, Los Angeles, Calif. (L)

CHANNEL GUIDE

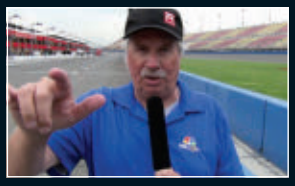
ABC	ESPN on ABC
CBS/CBSSN	CBS/CBS Sports Network
CNBC	NBC Business News
NBC	NBC Universal
NBCSN	NBC Sports Network
ESPN	ESPN networks
ESPN-N	ESPN News
FOX	FOX Broadcast Network
FS1	FOX Sports 1 (formerly SPEED)
FS2	FOX Sports 2 (formerly FUEL)
TNT	Turner Network Television
VELOCITY	Velocity Channel
L	Live Program
R	Repeat Program
TBD	Start Time to Be Determined
D	Delayed from Earlier Day
SDD	Same Day, Delayed

All listings subject to change. Networks may broadcast programs at different times in different time zones. Check local listings.

MULTIMEDIA

EPIC RACE, EPIC RANT

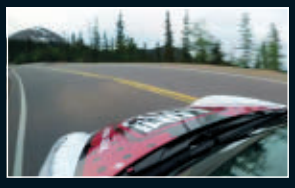
Robin Miller's Fontana message



Robin Miller's video message to IndyCar boss Mark Miles from Fontana's Auto Club Speedway on the sparse attendance for that race lit up RACER.com and The RACER Channel on YouTube.

PEAK PERFORMANCES

Jeff Zwart at Pikes Peak



Pikes Peak can be a frustrating event to follow live but in-car video offers a taste of its unique thrills. Watch in glorious 4K resolution as Jeff Zwart charges to victory in the Time Attack 1 Class with his Porsche.

ON TWITTER

@Kenny_Wallace has long been active on Twitter, but will have more time to devote to engaging with his fans on social media as well as his analyst gigs with FOX Sports after calling time on his 26-year career as a NASCAR racer.

RACER.com

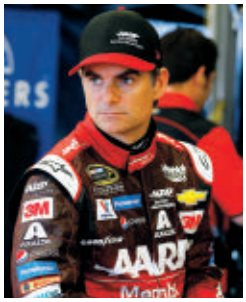
Robin Miller's Mailbag now also contains Marshall Pruett's answers to your technical questions. Send all questions to MillersMailbag@Racer.com

ANNIVERSARIES

AUGUST BIRTHDAYS


ANGELLE SAMPEY

Mario Illien, 8/2/49; Brian France, 8/2/62; Joe Leonard, 8/4/34; **JEFF GORDON, 8/4/71**; Kurt Busch, 8/4/78; James Jakes, 8/4/87; Gordon Johncock, 8/5/36; **ANGELLE SAMPEY, 8/7/70**; Nigel Mansell, 8/8/53; Pippa Mann, 8/11/83; Parnelli Jones, 8/12/33; Rusty Wallace, 8/14/56; Carl Edwards, 8/15/79; Nelson Piquet, 8/17/52; Nigel Bennett, 8/18/40; Andy Pilgrim, 8/18/56; Memo Rojas, 8/18/81; Mike Conway, 8/19/83; Nico Hulkenberg, 8/19/87; Doug Kalitta, 8/20/64; Paul Menard, 8/21/80; Kenny Wallace, 8/23/63; Derek Warwick, 8/27/54; Gerhard Berger, 8/27/59; Mark Webber, 8/27/76; Melanie Troxel, 8/31/72.



JEFF GORDON
B. 8/4/71

It's hard not to still think of him as Wonderboy, the kid who took NASCAR by storm in *RACER*'s formative years of the 1990s, but Jeff's 44 now and in the midst of his final Sprint Cup season.

He's won four Cup titles and might well have had two or three more, but for the peculiarities of the Chase. Is there still some magic left for 2015?

WE REMEMBER


JERRY GRANT

Ettore Bugatti, 8/21/47; Tazio Nuvolari, 8/11/53; Peter Collins, 8/3/58; Jean Behra, 8/1/59; Ken Miles, 8/17/66; Jerry Titus, 8/5/70; Tiny Lund, 8/17/75; Mark Donohue, 8/19/75; Patrick Depailler, 8/1/80; Manfred Winkelhock, 8/12/85; Didier Pironi, 8/23/87; Sheldon Kinser, 8/1/88; **ENZO FERRARI, 8/14/88**; Tim Richmond, 8/13/89; J.D. McDuffie, 8/11/92; Clifford Allison, 8/13/92; Roger McCluskey, 8/29/93; Blaine Johnson, 8/31/96; Jim Crawford, 8/6/02; Steve Stabler, 8/9/02; Lance Macklin, 8/29/02; Tony Rudd, 8/21/03; Phil Hill, 8/28/08; **JERRY GRANT, 8/12/12**; Len Terry, 8/27/14; Bjorn Waldegaard, 8/29/14.

ENZO FERRARI
D. 8/14/88

Less than a month after Enzo died at the age of 90, the Italian GP saw Ferrari score a 1-2 at Monza. And those stories of extreme emotional highs and lows are intrinsic to the history of the Ferrari marque. They, along with the mysterious charisma of its patriarch, will ensure Ferrari will forever be in a category of its own when assessing the greatest race teams of all time.

WHO MARK DONOHUE
WHERE BOTH SIDES OF THE ATLANTIC
WHEN 1965-'75

LAT archive

Winning the Can-Am race at Mosport in 1966 in a Penske-run Lola-Chevrolet was the start of a hugely successful partnership between "Captain Nice" and the man who came to be known simply as "The Captain."

It's ironic that Mark Donohue, the man who stood out from so many of his compatriots in motorsport by embracing and mastering road course racing, should find his greatest moment on an oval in the world's most famous race.

But, of course, the 1972 Indianapolis 500 winner's legacy is far greater than that. Donohue belongs in an exclusive club of great engineer-racers, along with the likes of Sir Jack Brabham, Dan Gurney, Bruce McLaren and Al Holbert. And he was the pendulum that made Penske Racing tick in its first decade, chiming in with three Trans-Am titles in Chevrolet Camaros and an AMC Javelin, the '69 Daytona 24 Hours in a Lola T70-Chevy, the '73 Can-Am title with the awesome Porsche 917/30, and three of Penske's first four Indy car victories, as well as RP's first NASCAR win and first Formula 1 podium finish (on Mark's F1 debut!).

SCCA National Champion in an Elva Courier in 1961, Donohue was taken under the wing of Walt Hansgen, a very accomplished road racer in his own right. Hansgen arranged an MGB for Mark to race in the Bridgehampton 500, which he won, and together they raced a Ferrari 275 GTB to an 11th place finish at Sebring in '65. That same year, he won SCCA divisional titles in a Shelby Mustang GT350 and a Lotus 20B.

LAT archive

In 2012, Roger Penske told *RACER*, "Mark triggered a change in the sport. He was a very special guy and driver, and a close friend."

LAT archive

Donohue dominated the '71 Indy 500 until the gearbox broke, but won his next two Indy car races, then conquered Indy in '72 (ABOVE).

No less significant, though, was the work Donohue was doing as development driver and design engineer for Griffith Motors, a company that did to British TVR cars what Shelby had done with ACs – cram a big Ford V8 under the hood. It tapped into the theories he learned when graduating with a degree in engineering, and the experience he'd acquired over the previous seasons.

And that's what made him invaluable to driver-turned-team-owner Roger Penske. Together they won the 1966 Can-Am race at Mosport, stamped their mark across the US Road Racing Championship, and went on to those aforementioned legendary victories.

Following his dominant Can-Am campaign of '73, Donohue retired – and then came back to win the '74 IROC title, and return to the "unfinished business" of F1. Then, tragically, when a tire failed in practice at Osterreichring on Aug. 19, 1975, Penske's pendulum was silenced. ■

LAT archive

OPPORTUNITY MISSED

Despite a remarkable third on his F1 debut at a rain-soaked Mosport in 1971, the 38-year-old Mark Donohue's return to F1 three years later mystified many. But the allure of trying to sort the recalcitrant Penske PC1 (ABOVE) was too great to resist.

Soon after scoring a fifth place in the Swedish GP, Penske and Donohue switched to a March 751, in which Mark achieved another fifth at Silverstone. But two races later, America lost one of its racing icons.

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Competition GTS-class turbocharged Optima, TCA-class Forte Koup, and B-Spec Rio 5-Door shown.