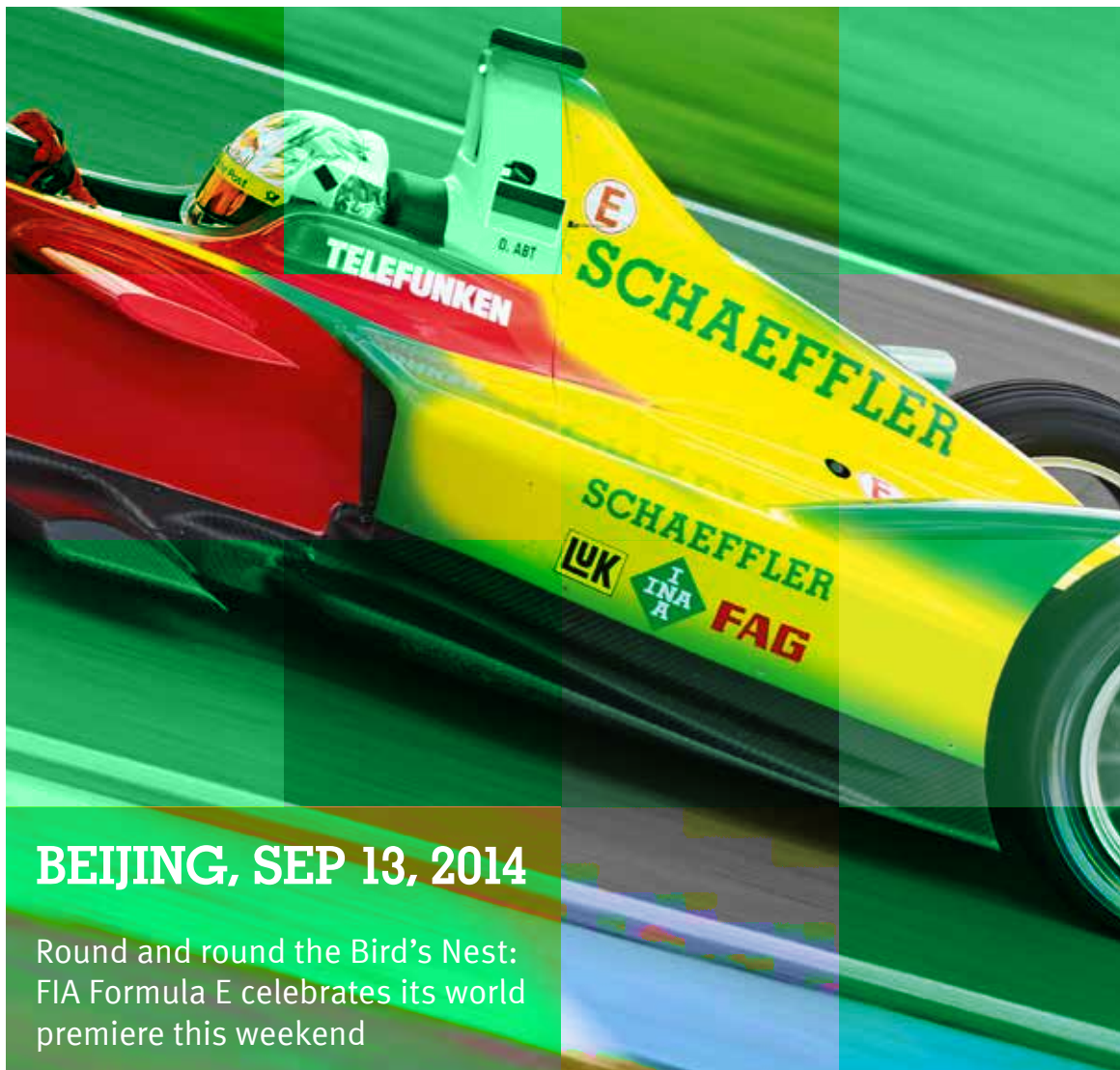


FACT SHEET XXL ROUND 1

FIA FORMULA E 2014

SCHAEFFLER



BEIJING, SEP 13, 2014

Round and round the Bird's Nest:
FIA Formula E celebrates its world
premiere this weekend



INNOVATION
FIA Formula E
technology

p. **8**



MOBILITY FOR TOMORROW
How Schaeffler successfully tackles
the challenges of the future

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Editorial



More than a year of planning, developing, organizing and testing – now the time has finally come: Formula E is celebrating its world premiere in Beijing. At Schaeffler, we're proud to be on board right from the beginning. Our company is tackling the challenge of making mobility for tomorrow possible with all its expertise and passion. The electrification of the automobile plays a major part in this. And where else is it more fascinating than on the race track? So let's join together in looking forward to the start of a new era.



Jörg Walz
Head of Communications and Marketing
Schaeffler Automotive



Teaming up for a new era of motorsport

Schaeffler is on the FIA Formula E grid as the exclusive Technology Partner of Team ABT Sportsline and featured with its logo on the cars of Daniel Abt and Lucas di Grassi

Formula E marks the start of a new generation of motorsport. For the first time, car races are held with race cars powered strictly by electricity. The identical single-

Kontakt



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seaters reach a speed of up to 230 km/h, accelerating from zero to 100 km/h in less than three seconds. During the near-60-minute race there is one pit stop at which the car is changed.

▶▶ SCHAEFFLER AND ABT FORM GERMAN TEAM

ABT is the only German team in the international field that includes squads from the USA, India, China and Europe. The former Formula One stars Alain Prost and Jarno Trulli are entering their own teams, as well as adventurer Richard Branson and actor Leonardo DiCaprio. More than ten drivers have experience in Formula One. Formula E races are not held on permanent race tracks but on street circuits in

the heart of major cities. Following the inaugural race in Beijing, where the track also circles the Olympic Stadium, the next stops will be Kuala Lumpur (Malaysia), Punta del Este (Uruguay), Buenos Aires (Argentina), Miami and Long Beach (both USA), Monaco and Berlin (Germany) as well as London (Great Britain), where the finale will take place on June 27, 2015.

▶▶ FORMULA E: RACES AS SPECIAL EVENTS

Free practice, qualifying and the race all take place on a single day at the events, so the drivers don't have much time to home in on the completely new race tracks – which makes for additional suspense. A concert

featuring international top stars, included in the ticket, complements the action-packed day. ■



Signing the agreement: Chief Technology Officer Prof. Peter Gutzmer, ABT Head of Marketing Harry Unflath and Hans-Jürgen Abt

At home in the motorsport world

FIA Formula E is the new element in Schaeffler's portfolio of motorsport commitments. The company has a successful track record in other categories spanning several years – in top-flight racing as well as in promoting young talent



Baja 1000 is regarded as the world's toughest off-road race. The loads acting on vehicle components are greater there than anywhere else. The event is an ideal test bed for the components from Schaeffler. The company supports Team All German Motorsports with rally legend Armin Schwarz. The AGM Trophy Truck sports the conspicuous Schaeffler graphics and is shown here meeting with Mike Rockenfeller's DTM car on the Nordschleife of the Nürburgring.

B

WEC

Covering 5,000 kilometers on a single day – in the pinnacle event of the FIA World Endurance Championship (WEC), the Le Mans 24 Hours, maximum demands are made on the cars – a standard that Schaeffler equally applies to its production technologies. That's why the WEC commitment with races in Europe, South America, the USA and Asia is such a perfect fit. Schaeffler's partner is the sports car manufacturer Porsche that in 2014 celebrated its return to the top category of what is arguably the world's most famous auto race.





BAJA



FORMULA STUDENT

The world is becoming increasingly complex, and so are the solutions to future challenges. That's why it's particularly important for tomorrow's engineers to start learning how to transfer ideas and innovations as part of their studies. Therefore, Schaeffler partners with Formula Student. The things being practiced here on a small scale are exactly the same ones Schaeffler does on a large scale.

DTM

Schaeffler has been involved in the most popular international touring car series for years. In 2011, the company extended its presence and began to give its name to one of the cars of Audi Sport Team Phoenix. The success was overwhelming: Martin Tomczyk (2011) and Mike Rockenfeller (2013) in the green-yellow Schaeffler Audi each celebrated winning the drivers title, which makes them the company's fastest ambassadors.





Shaping mobility for tomorrow

Sustaining mobility for the future and helping to successfully shape it – this is the strategy pursued by Schaeffler. Alternative drive systems or the continuous development of renewable energy sources are just two key words in this context

Environmental pollution, global warming, traffic gridlocks and the finite nature of fossil fuels – the challenges posed to future mobility are massive. Therefore, Schaeffler has been committed to the ‘Mobility for Tomorrow’ growth strategy that aims to find sustainable solutions for tomorrow’s world.

The Schaeffler success story begins more than 130 years ago when in 1883 Friedrich Fischer designs the ball grinding mill and thus not only lays the foundation for FAG but also for the entire modern rolling bearing industry. In 1946,

INA is founded by the brothers Dr. Wilhelm and Dr. Georg Schaeffler in Herzogenaurach, where the Schaeffler headquarters is still located today. The Schaeffler subsidiary LuK in 1965 introduces the first diaphragm clutch in Europe, causing a sensation immediately after the company was founded. In 2003, the Schaeffler Group is formed from the three brands INA, LuK and FAG.

▶▶ 170 LOCATIONS IN 49 COUNTRIES

Since then, Schaeffler has evolved into a true global player represented on all continents.

More than 80,000 employees at 170 locations in 49 countries ensure Schaeffler’s proximity to customers and the resultant development of market-specific products, short lead times and fast support.

▶▶ 225,000 PRODUCTS IN THE PORTFOLIO

Today, Schaeffler’s portfolio includes about 225,000 products – from tiny high-precision bearings for dental drills, to rolling bearings and linear guides for machine tools, to heavy-weights for roadheaders or wind turbines. The customer base covers 60 sectors. ■

“Formula E perfectly fits us”

As the Chief Technology Officer, Prof. Peter Gutzmer put the FIA Formula E commitment on track and personally watched the action during test tracks at Donington. The member of the board in a brief interview.



Now forming a strong team: Chief Technology Officer Prof. Peter Gutzmer with the two Formula E drivers Lucas di Grassi (left) and Daniel Abt

► **Why is Schaeffler active in Formula E?**

PETER GUTZMER “Helping to shape the electrification of the automobile is one of our central forward-thinking topics. Schaeffler is an innovation leader in this field and frequently pioneers new ideas. The FIA Formula E is bold and visionary, which makes it a perfect fit for Schaeffler, and an ideal complement to our other commitments.”

How does the motorsport commitment affect Schaeffler’s routine business?

“Motorsport is not only ideally suited to accelerate the further development of new technologies but also energizes the topic of electric mobility with emotions in a fascinating way.”

What does the technical support of the team look like?

“In the first year, the Formula E regulations sensibly do not permit any proprietary developments. It is planned that we will support the subsequent further development of the race car and its components with the know-how and experience of our engineers.” ■



Large bearings with a diameter of up to 3.5 meters for wind turbines can be tested on the world’s only test rig for large-scale bearings Astraios – one of many forward-thinking solutions by Schaeffler

SCHAEFFLER FACTS

- › 80,000 Employees
- 170 Locations worldwide
- 60 Schaeffler components in automobiles worldwide (average)
- 12 m Diameter of largest Schaeffler bearing (surface mining excavator)
- 1 mm Diameter of smallest Schaeffler bearing (dental drill)

AERODYNAMICS

Front and rear wing adjustable

BATTERY

Developed by Williams Advanced Engineering, charging time: approx. 40 minutes

STEERING WHEEL

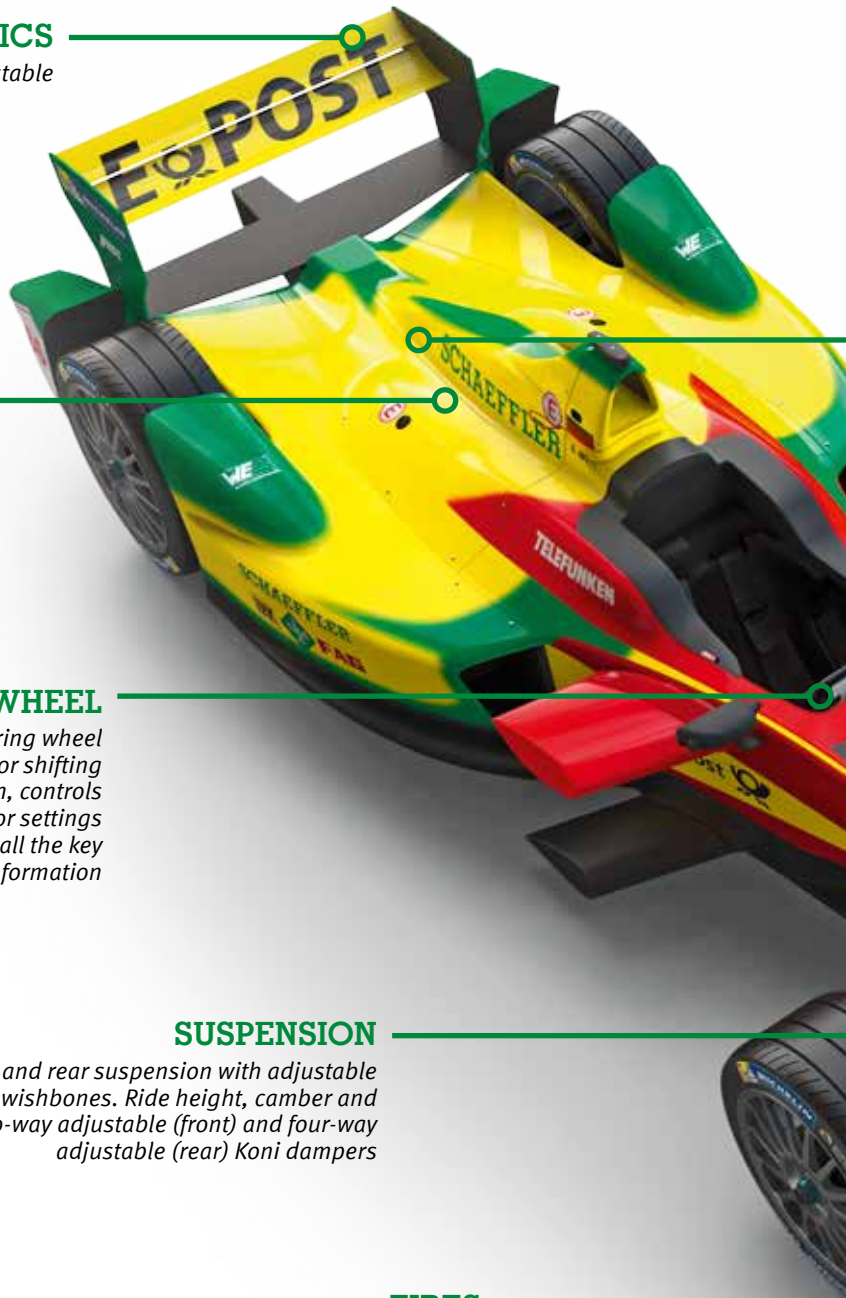
Specification steering wheel with paddles for shifting and recuperation, controls for various motor settings and display for all the key information

SUSPENSION

Independent front and rear suspension with adjustable stabilizers and double wishbones. Ride height, camber and toe are adjustable. Two-way adjustable (front) and four-way adjustable (rear) Koni dampers

TIRES

18-inch wheels with Michelin specification tires (same tread as for production cars)



High-tech for the race track

The Spark SRT_01E is a 'pedigree' race car packed with high technology. While the teams are still using identical technology in the inaugural season, it is planned to open up development opportunities step by step from the second year on

POWERTRAIN

Power unit and electronics by McLaren
Electronic Systems

CHASSIS

Specification carbon fiber/
aluminum chassis by Dallara

BRAKES

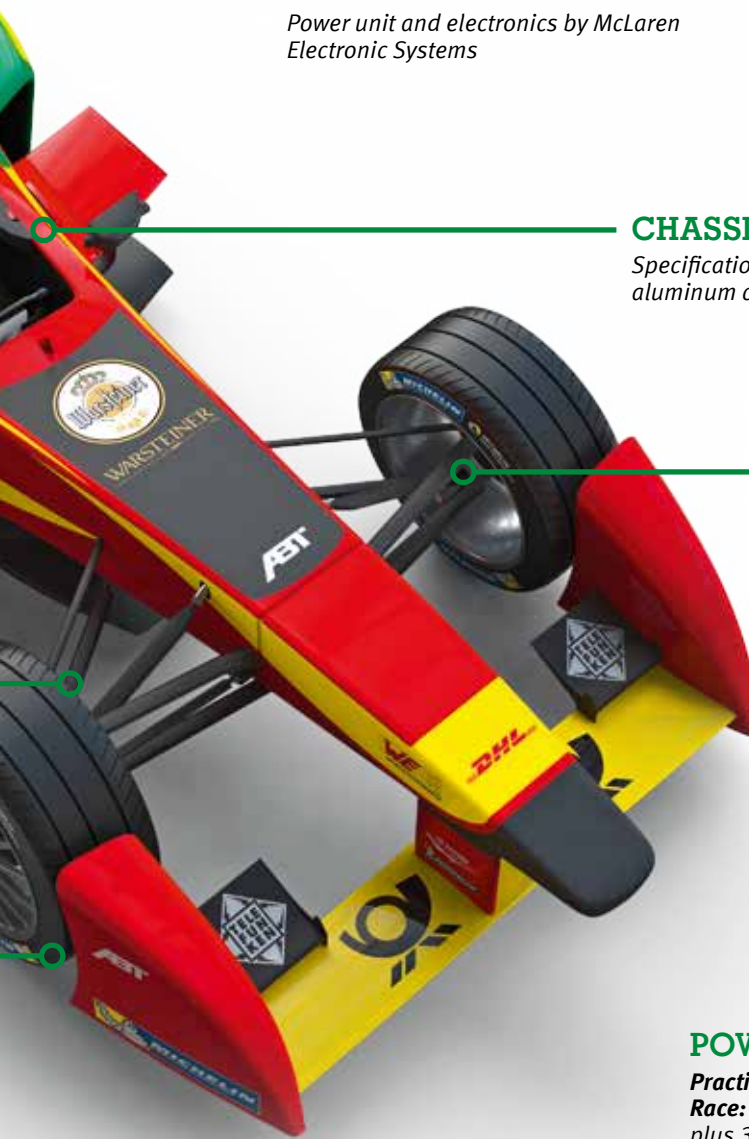
Hydraulic dual-circuit
braking system,
adjustable brake force
distribution

DIMENSIONS

Length: 5,000 mm
Width: 1,800 mm
Height: 1,250 mm
Weight: min 888 kg
including driver

POWER OUTPUT

Practice and qualifying: 200 kW (270 hp)
Race: 150 kW (202.5 hp)
plus 30 kW (40.5 hp) FanBoost



e: a small letter with a big effect

Full speed ahead – using electric power. Schaeffler demonstrates its flair for forward-thinking technology not only with its commitment in the world’s first all-electric racing series. Factually, the company has long moved from the development lab stage on to testing innovative technologies – from mass production vehicles through to bicycles

‘Mobility For Tomorrow’: The German technology corporation Schaeffler demonstrates exceptional expertise in innovative automotive technologies with various concept cars. For instance, in the case of hybrid vehicles, i.e. the combination of a conventional internal combustion engine and an electric motor, the company covers a very broad base, testing the entire range of what is technically conceivable and feasible at the moment, from the 12-volt micro-hybrid, to the 48-volt mild hybrid, through to the plug-in hybrid that can cover long distances.

► 100-PERCENT ELECTRIC DRIVE RESEARCH FIELD

Even though the potential of the conventional internal combustion engine is far from having been exhausted and Schaeffler keeps achieving potential savings in the double digit percentage range through numerous revolutionary details, the Schaeffler engineers have obviously been dedicating their research to 100-percent electric drive systems as well.

Various systems are being designed and tested, just like in the field of hybrid drives. It starts with the conventional

central drives, the so-called Schaeffler e-axes. A central e-module (EZM), where the mid-mounted electric motor is combined with a lightweight differential, marks the next evolutionary step. Near-wheel motors are even more technically sophisticated and on Schaeffler’s research agenda as well – for instance in a joint project with BMW and the German Aerospace Center (DLR) called ‘FAIR.’

► WHEEL HUB MOTORS AS THE TOP TECHNOLOGY

eWheelDrive, in other words in-wheel e-motors, marks the pinnacle of the



Schaeffler STEP²: A consumption improvement of six percent can be achieved thanks to the combination of an electric motor and a two-speed transmission. The permanent system output is 50 kW and can even reach a peak of 70 kW

art of engineering, and Schaeffler has already distinguished itself with several evolutionary steps in this field. In 2010, in an Opel Corsa, a prototype was created with a permanent development of 200 Newton meters and a peak torque level of 530 Nm per wheel. In 2013, a pure system in which permanent torque of 350 Nm per wheel and a maximum of 700 Nm were possible debuted in a Ford Fiesta. The next objectives are permanent torque of 500 Nm and a prototype in an 18-inch wheel. However, due to limitations in terms of top speed, wheel hub motors are primarily suitable for city cars.



eWheelDrive wheel-hub motors: Schaeffler presented the innovative system in a converted Ford Fiesta in 2013

► ANALOGY TO FORMULA E

For higher speeds above 130 km/h even electric motors require transmissions with several gear ratios – exactly the way in which this has been implemented in

the Formula E race car. In the STEP², an electric concept vehicle, Schaeffler publicly presented this technology with a two-speed transmission for the first time in mid-2014. ■

Ready to go: bicycle technology of the future



Schaeffler's 'Mobility for Tomorrow' strategy encompasses more than the development of innovative automotive technology. For bicycles, as well, Schaeffler has set a forward-thinking agenda and presented two advanced systems.

FAG-VELOMATIC Based on pedal frequency, energy, speed and inclination the FAG-VELOMATIC (pictured above) always finds the optimum gear and perfect shifting point. It is compatible with all gearing systems, in other words derailleur or hub gears, and obviously with e-bikes.



VELODAPTIC The complementary app (pictured below) captures all motion-related data such as speed, pedal frequency, energy, torque, up-/downhill gradients, distance and position, which makes it the perfect bike computer.



A tradition of innovation

The world's leading tuner of vehicles of the Volkswagen Group and a successful motorsport team: with the commitment in FIA Formula E ABT Sportsline takes up one of the greatest motorsport challenges – and does so with passion

ABT Sportsline is one of the most successful motorsport teams in Germany and Europe. Its history in racing dates back more than 60 years and began with initial victories

scored by Johann Abt in the 1950s. The first recorded success took place in a dirt track race, followed by victories and titles in touring car, sports car and formula racing. 2009 has

gone down in the company's history as the most successful one to date: Timo Scheider won the DTM, Christian Abt the ADAC GT Masters in the Audi R8 and youngster Daniel



Abt was victorious in the ADAC Formel Masters. Previously, in 2007, Schaeffler and ABT had jointly celebrated success as well: with the logos of LuK, INA and FAG on his A4, Mattias Ekström won his DTM title number two.

Founded as a smithy in 1896, the ABT company has been continually developing ever since. Just one thing has never changed: the family

still runs the company with about 170 employees and partners in 50 countries around the world. CEO Hans-Jürgen Abt now represents the fourth generation at the helm. For ABT, the commitment in Formula E also marks a return to the roots, as the team celebrated success in formula racing as far back as in the early 90s – among others, with Ralf Schumacher in the cockpit back then. ■

Moments

1970



Johann Abt († 2003), father of Hans-Jürgen and Christian Abt, becomes European Touring Car Champion

1999



The STW Championship marks the first major title for Christian Abt and the team

2007



Sporting the logos of the Schaeffler Group, Mattias Ekström becomes champion

2009



Christian Abt, Daniel Abt and Timo Scheider clinch three titles in a single year

A strong team in the cockpit

In Lucas di Grassi (30) and Daniel Abt (21) the squad of Hans-Jürgen Abt has its dream team filling the cockpits of the two Formula E race cars. The experienced Brazilian and youngster Daniel Abt are not only fast and technically adept but perfectly harmonize with each other off the race track as well

#11 LUCAS DI GRASSI (BR)

VITA

Date of birth 11 August 1984
Place of birth São Paulo (BR)
Domicile Monaco (MC)
Height / weight 1.79 m / 75 kg

HIGHLIGHTS

2005 1st in GP Macau
2006 Formula 1 test
2007 2nd in GP2 series, Formula 1 test driver
2008 3rd in GP2 series, Formula 1 reserve driver
2009 3rd in GP2 series, Formula 1 reserve driver
2010 Formula 1
2013 3rd in Le Mans 24 Hours
2014 2nd in Le Mans 24 Hours

SOCIAL MEDIA

🌐 lucasdigrassi.com.br
 🐦 @LucasdiGrassi



With his personable nature, experience from Formula One and other categories, as well as his long association with FIA Formula E, Lucas di Grassi was the team's declared driver of choice. As an Audi factory driver who was released for the commitment by his employer he has known the ABT Sportsline squad for a long time. The 30-year-old Brazilian has demonstrated that he feels at home in formula racing by finishing GP2 as the runner-up and winning the city street race in Macau.



Side jobs: Lucas di Grassi competes in the WEC as a factory driver for Audi in an R18 e-tron quattro and took second place this year in the legendary 24-hour race at Le Mans (L.). Daniel Abt is contesting his second season in the GP2 series (r.).



#66 DANIEL ABT (D)



VITA

Date of birth 3 December 1992
Place of birth Kempten (D)
Domicile Kempten (D)
Height / weight 1.79 m / 70 kg

HIGHLIGHTS

2007 2nd in ADAC Kart Championship
2008 8th in ADAC Formula Masters
2009 1st in ADAC Formula Masters
2010 2nd in ATS Formula 3 Cup
2011 4th in FIA Formula 3 International Trophy, 7th in Formula 3 Euro Series
2012 2nd in GP3 series
2013 GP2 series

SOCIAL MEDIA

🌐 danielabt.de
 📘 [abtdaniel](https://www.facebook.com/abtdaniel)
 🐦 [@Daniel_Abt](https://twitter.com/Daniel_Abt)

Daniel Abt numbers among the most successful German talents in formula racing. Following his title win in the ADAC Formel Masters and a foray into Formula 3, he celebrated second place in the GP3 Championship where he became familiar with the Formula One environment. He regularly appears on TV as an expert for the sports channel Sky. After a year of learning in GP2, the 21-year-old youngster is attacking in 2014, competing for Hilmer Motorsport in GP2 and for ABT Sportsline in FIA Formula E.

EVENT GUIDE

FACTS ABOUT THE RACE AT BEIJING

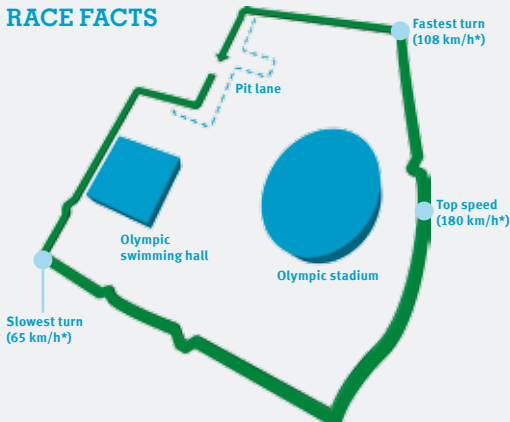
SCHAEFFLER



CALENDAR

- 13.09. Beijing (CN)
- 22.11. Kuala Lumpur (MAL)
- 13.12. Punta del Este (U)
- 10.01. Buenos Aires (RA)
- 14.02. TBA
- 14.03. Miami (USA)
- 04.04. Long Beach (USA)
- 09.05. Monaco (MC)
- 30.05. Berlin (D)
- 27.06. London (GB)

RACE FACTS



- Formula E Beijing ePrix, Olympic Village
- Track length: 3.453 m
- Distance: 25 laps (max 60 minutes)
- Overtaking possibilities: turn 1, 2, 6, 19 and 20

* according to simulation

ENTRY LIST

#2	Sam Bird	Virgin Racing
#3	Jaime Alguersuari	Virgin Racing
#5	Karun Chandhok	Mahindra Racing
#21	Bruno Senna	Mahindra Racing
#6	Oriol Servià	Dragon Racing
#7	Jerome d'Ambrosio	Dragon Racing
#8	Nicolas Prost	e.dams-Renault
#9	Sébastien Buemi	e.dams-Renault
#10	Jarno Trulli	Trulli Formula E
#18	Michela Cerruti	Trulli Formula E
#11	Lucas di Grassi	Audi Sport ABT
#66	Daniel Abt	Audi Sport ABT
#23	Nick Heidfeld	Venturi Formula E
#30	Stéphane Sarrazin	Venturi Formula E
#27	Franck Montagny	Andretti Formula E
#28	Charles Pic	Andretti Formula E
#77	Katherine Legge	Amlin Aguri
#55	Fabio Leimer	Amlin Aguri
#99	Nelson Piquet jr.	China Racing
#88	Ho-Pin Tung	China Racing

SCHEDULE SATURDAY, 13.09.2014

- 08:15–09:00 Free Practice 1
- 10:30–11:00 Free Practice 2
- 12:00–12:55 Qualifying (4 groups)
- 13:05–13:20 Press Conference (Media Center)
- 14:00–14:30 Pit Walk
- 14:05–14:25 Autograph Session (eVillage)
- 15:40 FanBoost Implementation
- 16:00 Race
- 17:10–17:35 Press Conference (Media Center)

TEAM ABT

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FORMULA E

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Learn more about mobility for tomorrow

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