

FACT SHEET XXL

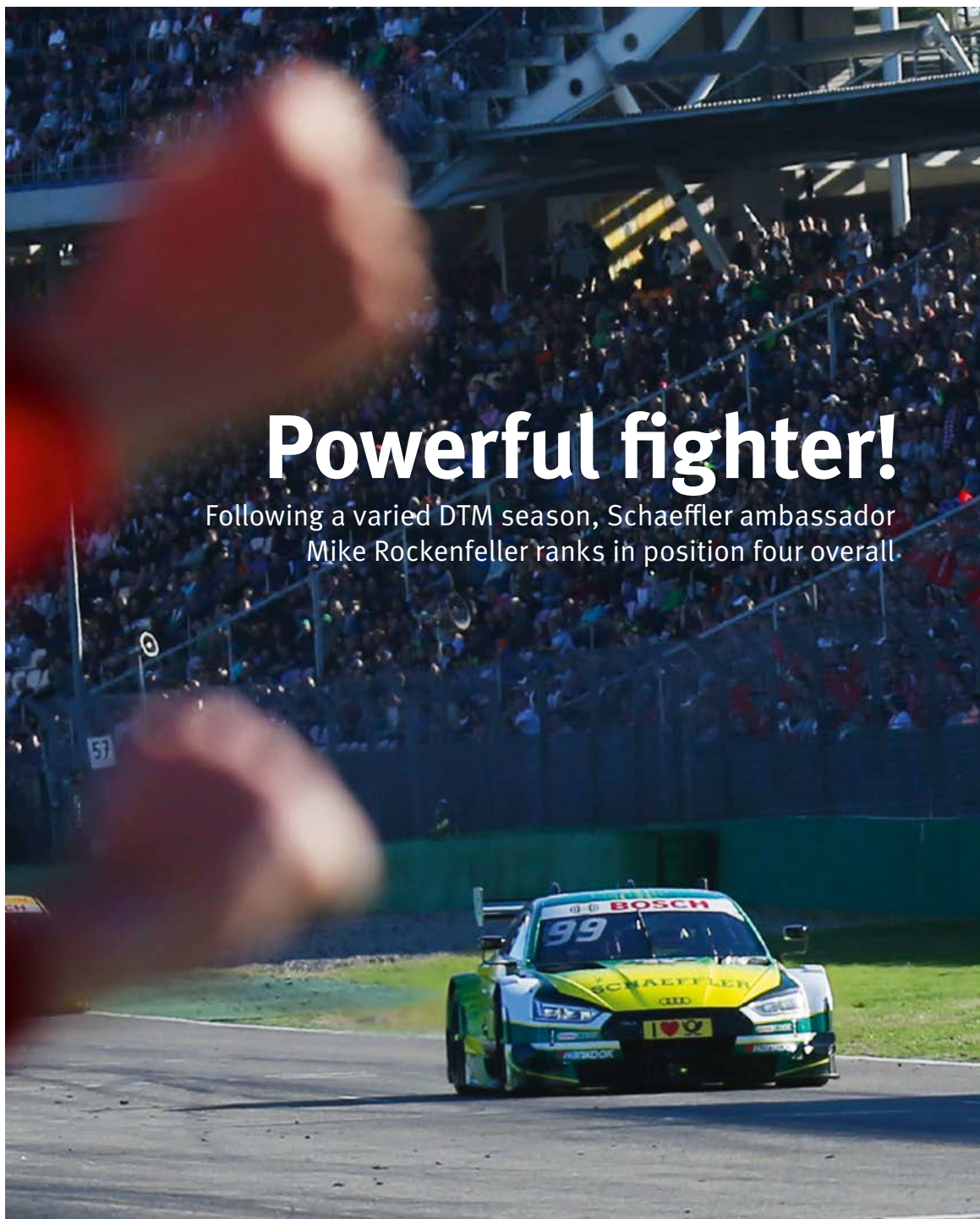
DTM 2017

SCHAEFFLER

Mike Rockenfeller in the Schaeffler Audi

Powerful fighter!

Following a varied DTM season, Schaeffler ambassador Mike Rockenfeller ranks in position four overall.



Editorial



Jörg Walz
Vice President
Communications and
Marketing Schaeffler
Automotive

I still remember the early years of the DTM well when serious amateur drivers in race cars that some of them had prepared in their own garages would give their best on tracks as spectacular as the air-field circuits in Diepholz or Mainz-Finthen. Even back in those days, Schaeffler with its LuK

product brand supported a number of teams and drivers. The series has long evolved into a premier one in European motorsport. Nobody with an interest in top-notch touring car racing can ignore the DTM anymore. Three German premium manufacturers – Audi, BMW and Mercedes – have been involved for years. Highly professional teams and some of the world's best drivers fight gripping battles. Since 2011, Schaeffler has been on the DTM grid with a race car of its own. Right in our debut season, and again in 2013, we celebrated the drivers' title win. In 2017, our campaigner, Mike Rockenfeller, in the Schaeffler Audi RS 5 DTM had the chance to become champion up until the last race. On the following 64 pages you can find out why ultimately the triumph was missed by just a few points and read other stories centered on the DTM and Schaeffler's commitment. Enjoy the read!

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Loyal Schaeffler ambassador Mike Rockenfeller competed sporting the Schaeffler colors for the sixth time in 2017

Motorsport in a class of its own

The DTM has been delivering top-class touring car racing for more than 30 years. The German manufacturers, Audi, BMW and Mercedes-Benz, and renowned drivers, battle for positions and points within the range of thousandths

The idea of a new touring car series was born in 1983 and, unlike other championships it did not group the field in various classifications. The driver to finish first was the winner: a transparent concept that was working well in the French Touring Car Championship too. The championship which in 1984 began as "Deutsche Produktionswagen-Meisterschaft" (German Production Car Championship) evolved into the most important international touring car series, DTM, over the period of more than three decades.

2017 marked a very special year for the DTM. For the first time, fans had the opportunity to watch the teams' activities at close range. Three garages were open, allowing visitors to take a look inside the inner sanctum – even during most of the sessions: another step of making the DTM as fan-friendly as possible.

A tight set of regulations has been ensuring a sporting competition on an equal footing for years. The 18 cars, each delivering about 500 hp, were driven by top-class campaigners from ten nations – among them six champions such as Schaeffler's longstanding ambassador and 2013 champion, Mike Rockenfeller. In a season dominated by Audi, René Rast crowned himself the new title winner. Rocky had a chance of winning the DTM crown up until the last race as well and, thanks to a total of

six podium finishes, took a solid fourth place overall.

Attractive for fans and partners

As usual, two races were held at each event. However – another novelty – both of them were now equally long. Each of the 18 classified rounds in the 2017 season covered a 55-minute distance plus one lap.

Schaeffler supported drivers and teams even in the DTM's early years. Stickers of the LuK product brand were displayed on driver suits and vehicles. In 2011, the technology group concentrated its commitments, gave its name to the Schaeffler Audi and celebrated impressive successes. In the year of its premiere, Martin Tomczyk won the title and in 2013, Mike Rockenfeller achieved the same feat. ■

The beginnings

Showing your colors

Recognition value Attached to the front apron of Mattias Ekström's 2007 Audi A4 DTM is the logo of Schaeffler's LuK product brand

"Motorsport emotionalizes and connects especially in the case of success," says Prof. Peter Gutzmer, Deputy CEO and Chief Technology Officer at Schaeffler. "Motorsport has traditionally enjoyed special significance at Schaeffler and Schaeffler's product brands – as befits an innovation-driven technology group." The tradition of the longstanding DTM commitment starts as early as in the mid-1980s. The LuK logo adorns Kurt Thiim's Rover Vitesse, among other cars. In the first event at Zolder in 1986, the Danish rookie races to victory from position two on the grid, marking the first triumph for a vehicle with LuK branding. At the end of the season, Thiim even wins the title. In the following years, the INA and LuK logos can be seen on many other cars of the Alpina, Audi, BMW, Ford, Mercedes-Benz and Opel brands, and on the racing suits of their drivers – including the one of Champion Mattias Ekström in 2007 and his fellow Audi driver Mike Rockenfeller.

- 1 1986 championship-winning car Kurt Thiim's Rover Vitesse in a wild drift
- 2 The good old days Peter Oberndorfer (left) and Christian Danner engaged in small talk some 30 DTM years ago



Schaeffler's brand history in the DTM

The journey of the LuK, INA and FAG product brands to the Schaeffler umbrella brand

1986



1987



1988



1989



2007



2013



2017



2011 season



Green-yellow surprise

A colorful party Audi Sport Team Phoenix with Team Director Ernst Moser and driver Martin Tomczyk is the 2011 DTM Champion

For the 2011 season, Schaeffler concentrates its commitments and gives its name to a whole race car of Audi Sport Team Phoenix. Its visual appearance: conspicuous. Its performance: conspicuously fast. The Schaeffler Audi A4 DTM which the motorsport scene at first has endearingly dubbed “caipirinha express” is soon reverently referred to as “the Schaeffler Audi.” According to the regulations, all the drivers compete in vehicles of the 2008 and 2009 generations. The Schaeffler Audi is one of the older models, which is not a disadvantage at all for campaigner Martin Tomczyk but rather a challenge. The 29-year-old Bavarian pulls off the biggest coup in the more recent DTM history because he’s the first driver to become champion in a previous-generation car, and in an awesome way: Tomczyk claims a place in the top five in all ten races of the season, including three victories. His success is also a major triumph for the entire Schaeffler Group: champion in its DTM debut year. ■

- 1 A moment of happiness At Valencia, one race before the end of the season, Martin Tomczyk achieves his masterpiece
- 2 A true winner Schaeffler campaigner Martin Tomczyk dominates the season at his leisure

Final drivers' classification

P	Driver/Team	Pts
1	Martin Tomczyk (D) Phoenix Racing, Audi	72
2	Mattias Ekström (S) ABT Sportsline, Audi	52
3	Bruno Spengler (CDN) HWA, Mercedes-Benz	51
4	Timo Scheider (D) ABT Sportsline, Audi	36
5	Jamie Green (GB) HWA, Mercedes-Benz	35
6	Mike Rockenfeller (D) ABT Sportsline, Audi	31
7	Gary Paffett (GB) HWA, Mercedes-Benz	25
8	Ralf Schumacher (D) HWA, Mercedes-Benz	21
9	Edoardo Mortara (I) Team Rosberg, Audi	21
10	Oliver Jarvis (GB) ABT Sportsline, Audi	14

Final teams' classification

P	Team	Pts
1	ABT Sportsline, Audi	85
2	HWA, Mercedes-Benz	76
3	Phoenix Racing, Audi	72



2013 season



Three cheers for the champion Mike Rockenfeller's green-yellow Audi RS 5 DTM stands out in the 2013 DTM field



- 1 Conspicuous Mike Rockenfeller's green-yellow Audi RS 5 DTM stands out in the 2013 DTM field
- 2 Proud of "his" champion Prof. Peter Gutzmer, Schaeffler's Deputy CEO and Chief Technology Officer, with the champion's scarf



Conventional sports wisdom says that winning one's first title is not difficult, but repeating such a success all the more. Following Martin Tomczyk's switch to BMW, Schaeffler snatches a promising youngster as a campaigner in the 2012 DTM: Mike Rockenfeller. Finishing the season in fourth overall, Rockenfeller instantly confirms the hopes pinned on him. Never change a winning team – in 2013, Schaeffler, Rockenfeller and Audi Sport Team Phoenix form an aggressive trio. As early as in race two at Brands Hatch, Rocky celebrates his first victory of the season, takes the lead of the standings and goes on to fight a gripping duel with title defender Bruno Spengler. Victory number two at Moscow produces an early decision in favor of the Schaeffler campaigner. As early as after the penultimate race at Zandvoort, Rockenfeller can no longer be bumped from position one overall: the second title for Schaeffler in its third year as a vehicle sponsor and victory for Audi Sport Team Phoenix in the teams' classification. ■

Final drivers' classification

P	Driver/Team	Pts
1	Mike Rockenfeller (D) Phoenix Racing, Audi	142
2	Augusto Farfus (BR) BMW Team RBM, BMW	116
3	Bruno Spengler (CDN) BMW Team Schnitzer, BMW	82
4	Christian Vietoris (D) HWA, Mercedes-Benz	77
5	Robert Wickens (CDN) HWA, Mercedes-Benz	70
6	Gary Paffett (GB) HWA, Mercedes-Benz	69
7	Mattias Ekström (S) ABT Sportsline, Audi	68
8	Marco Wittmann (D) BMW Team MTEK, BMW	49
9	Timo Glock (D) BMW Team MTEK, BMW	40
10	Timo Scheider (D) ABT Sportsline, Audi	37

Final manufacturers' classification

P	Brand	Pts
1	BMW	369
2	Audi	347
3	Mercedes-Benz	266

Final teams' classification

P	Team	Pts
1	Phoenix Racing, Audi	161
2	BMW Team RBM, BMW	148
3	HWA, Mercedes-Benz	147

Changes 2017

at a glance

The 2017 DTM season featured a number of changes. In addition to opening the team garages to the fans, the organizers fine-tuned the technical and sporting regulations in order to make the series as exciting and transparent as possible. A greater focus was particularly placed on the drivers' skills. An overview

Technology

Engine

The 4-liter V8 engines in 2017 delivered more than 500 HP. The higher engine output resulted from the air restrictors in the intake system having been enlarged from 28 to 29 millimeters. In addition, special areas in the engine's intake system have been released for further development in order to optimize performance.

Aerodynamics

The specifications of the new Technical Regulations encompassed reductions in aerodynamics in order to decrease downforce of the vehicles. For this purpose, the geometries of the front splitter, underfloor and rear diffuser were modified and ride height was increased. Use of the drag reduction system (DRS), which makes overtaking easier, was limited to twelve laps (a total of 36 activations) in all races.

Tires

In conjunction with the new Hankook specification tires that provide more short-term grip but degrade more heavily over time, the resulting overall handling characteristics of the new DTM race cars made clearly greater demands on the driver.

Specification components

This year's body styles corresponded to the most recent vehicle generations of their production counterparts. In order to limit the areas that permit cost-intensive high-tech developments by the manufacturers, clearly more areas for jointly developed specification components than before have been included in the new regulations.



Sport

Races

Each of the 18 classification races covered a 55-minute distance, plus one lap. As a result, the race duration of a weekend was extended by ten minutes compared with last year (60 and 40 minutes).

Radio

During the races, radio communications between the pit lane and the driver were prohibited. As a result, the driver had to assume clearly more responsibility and make decisions himself. The radio ban was only lifted in a few exceptional situations such as a safety car period.

Heating blankets

The utilization of heating blankets was prohibited. Consequently, the drivers had to first bring their tires up to the optimum temperature both at the start and after the pit stop. This opened up opportunities for additional overtaking maneuvers.

Pit stops

In each race, a mandatory pit stop, no earlier than after the first and no later than after the last race lap, had to be made. This resulted in many tactical opportunities to define the race strategy. The teams had to perform their tire changes with clearly fewer crew members than before and were only allowed to use two impact wrenches. As a result, the pitting time of the cars inevitably became longer and every single mechanic had additional tasks to perform and thus more responsibility than before.

Racing time

In 2017, the times at which the DTM race cars were seen on track were longer than before. In addition to the two races, they continued to be out during the free practice sessions – each lasting for 30 minutes on Friday, Saturday and Sunday – plus in the two qualifying sessions of 20 minutes each. This resulted in a total driving time of four hours per race weekend.

Rule of *three* ...

The third-generation Schaeffler Audi RS 5 DTM was developed in parallel to the production model. It appeared even more progressive and in terms of aerodynamics was even more extreme than its predecessor. In the 2017 season, Mike Rockenfeller again represented the Schaeffler colors

Engine

Normally aspirated gasoline engine 90° V8,
4 valves per cylinder, 4,000 cc

Steering wheel

Servo-assisted rack
and pinion steering

Suspension

Independent front and
rear suspension, double
wishbones, pushrod
system with spring/
damper unit

Drivetrain

Rear-wheel drive,
4-plate CFRP clutch,
semi-automatic 6-speed
transmission with
paddle shift, adjustable
plate-type limited slip
differential

Chassis

CFRP monocoque with integrated fuel cell (120 l),
front, rear and lateral CFRP crash elements

Tires

Hankook specification tires; front:
12 x 18 inches; rear: 13 x 18 inches

Brakes

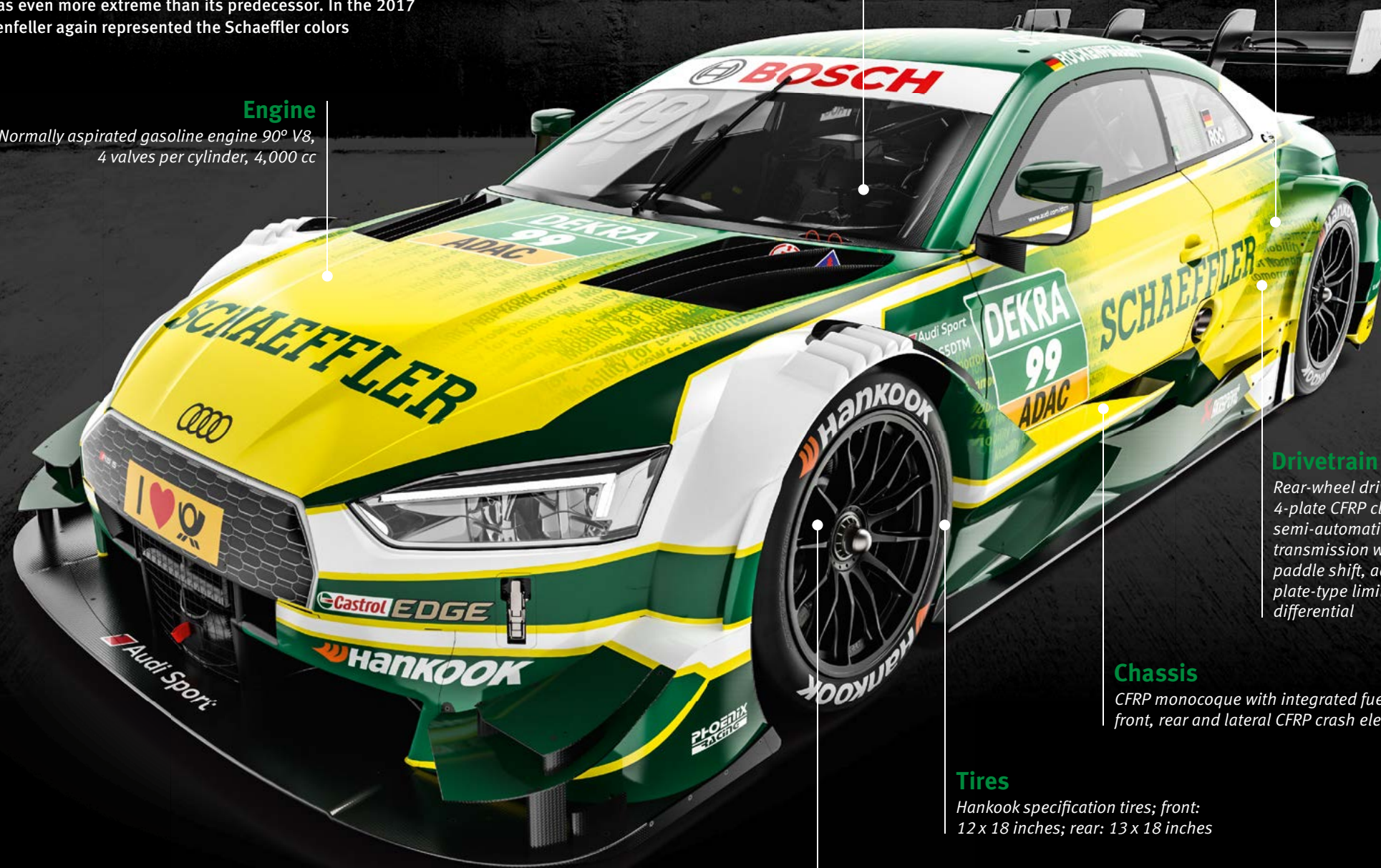
Hydraulic dual-circuit brake systems,
adjustable brake balance, light alloy
monobloc brake calipers

Dimensions

Length 5,010 mm (incl. rear wing)
Width 1,950 mm
Height 1,150 mm
Weight 1,125 kg (incl. driver)

Power output

More than 500 HP
More than 500 Nm torque





Experience is a trump card

Phoenix Racing is one of the few teams that have been racing in the DTM ever since the series' comeback in 2000. For the 2017 season, the Eifel-based team partly reorganized itself

Audi and Phoenix Racing have been partners in the DTM since 2006. The squad based in Meuspath in the Eifel region has won the DTM drivers' title twice and provided the best Audi driver in the overall classification four times. Since the racing series' comeback in 2000, the team has been active in the DTM, which makes it one of the most experienced outfits in the field.

Major successes of Phoenix Racing

- 1st place 2011, 2013 DTM (drivers)
- 1st place 2013 DTM (teams)
- 1st place 2000, 2003, 2012, 2014
24 Hours of Nürburgring
- 1st place 2007, 2012 24 Hours of Spa
- 1st place 2012 12 Hours of Bathurst
- 1st place 2009 FIA European GT3 Championship
- 1st place 2009 Belgian GT3 Championship
- 1st place 1999 Touring Car GP Macau

In 2017, there were a number changes in personnel at Phoenix. Alongside Team Director Ernst Moser and Team Manager Dirk Theimann, Jürgen Jungklaus has returned to the DTM as Head of the Team. The seasoned engineer led Mike Rockenfeller to the DTM title in the 2013 season and had to take a break last year for health reasons.

GT racing is Phoenix Racing's second pillar. The team has won the 24-hour race at the Nürburgring twice with the Audi R8 LMS. GT racing commitments were again undertaken in 2017. Since 2016, Phoenix Racing has been involved in various commitments in Asia, including those in the Audi R8 LMS Cup. ■

[Phoenix.Racing.GmbH](#)
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Back on the fast track

Together with Phoenix Racing and Schaeffler Mike Rockenfeller in 2013 achieved his greatest success in motorsport to date when he became DTM Champion. Following two difficult years, Rocky was in contention at the very front of the field again in 2017

Position 14, position 7, position 6, position 4, position 1 – since 2009, Mike Rockenfeller has evolved into a top-class driver in the DTM. In 2013, his upward performance curve culminated in winning the drivers' title. In addition, he occupied a strong third place in the overall standings in 2014. In the past two years, the Schaeffler brand ambassador remained below his expectations. No reason to bury his head in the sand. "I'm confident that we're going to make it back to the top," said Rockenfeller. No sooner said than done! In 2017, Rocky picked up where he left off in his championship-winning year and up until the last race weekend at the Hockenheimring still had a chance of clinching his second title. ■

Career highlights

- 2003 2nd Porsche Carrera Cup
- 2004 1st Porsche Carrera Cup
- 2005 1st GT2 class FIA GT Championship
1st GT2 class 24 Hours of Le Mans
- 2006 1st 24 Hours of Nürburgring
- 2008 1st Le Mans Series
- 2010 1st 24 Hours of Le Mans
- 2013 1st DTM (with Schaeffler)
"ADAC Motorsportsman of the Year"
- 2014 3rd DTM (with Schaeffler)

Biography

Date of birth	October 31, 1983
Place of birth	Neuwied (D)
Residence	Landschlacht (CH)
Marital status	Married to Susanne, two sons (Phil and Paul)
Height	1.75 m
Weight	68 kg
Motorsport since	1995

[mikerockenfeller](#)
[@m_rockenfeller](#)
[mike-rockenfeller.de](#)
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Tour of *Europe*

5 countries, 8 tracks, 9 events, 18 races, incredible action – the DTM in 2017 again left nothing to be desired. How Schaeffler, Mike Rockenfeller and Audi Sport Team Phoenix experienced the season

R 1

R 2

May 6/7, 2017

Hockenheim 

An opener made to *measure*



Any racer's dream Mike Rockenfeller
with champagne on podium following
position three in race one



Saturday

For the 20th time in succession, Hockenheim is the venue of the DTM season opener. Schaeffler campaigner Mike Rockenfeller, following the 2016 season – in position 19 overall the worst in his DTM career – is on a recovery course, but clearly gets off it in the first qualifying session: grid position 16 is all he scores. In the race, his Audi Sport Team Phoenix calls him in for the mandatory pit stop as early as on lap nine. Considering tire wear, this is a bold, albeit plausible maneuver due to the close gaps in the field. Back out, Rocky has a clear track and floors the pedal. After most of the drivers have visited their crews for the tire change about halfway through the race, the Schaeffler Audi RS 5 DTM is already in position five. By the time the checkered flag falls, Rockenfeller makes up two more positions and, finishing in third place, has overcome a barren spell of 24 DTM races without a podium finish.

10

This is the number of DTM seasons contested by Mike Rockenfeller. In 2017, he tackles his eleventh one. After Mattias Ekström (17), Gary Paffett (14), Bruno Spengler and Jamie Green (13 each) this makes him the fifth most senior driver

Rockenfeller's starting base for race two is clearly better: grid position five. By contrast, the weather conditions are clearly worse. Heaven repeatedly opens its floodgates above the Hockenheimring and confronts the drivers and their teams with difficult tasks. Following another early stop, Rocky has to pit again later in the race to change to rain tires. In the end, he crosses the finish line in position seven and after the season opener is in a solid fifth place of the standings.

Sunday

May 6/7, 2017

Hockenheim 

Race 1

P	Driver	Time
1	L. Auer (A)	57m 23.598s
2	T. Glock (D)	+1.942s
3	M. Rockenfeller (D)	+3.351s
4	E. Mortara (I)	+3.984s
5	M. Ekström (S)	+4.275s
6	R. Rast (D)	+5.855s
7	G. Paffett (GB)	+6.956s
8	P. Di Resta (GB)	+13.648s
9	N. Müller (CH)	+17.510s
10	M. Wittmann (D)	+19.190s

Laps 36

Pole position L. Auer, 1m 30.649s

Fastest race lap

M. Ekström, 1m 33.201s

Race 2

P	Driver	Time
1	J. Green (GB)	56m 53.264s
2	G. Paffett (GB)	+4.936s
3	M. Wittmann (D)	+8.191s
4	L. Auer (A)	+16.985s
5	N. Müller (CH)	+26.959s
6	P. Di Resta (GB)	+27.426s
7	M. Rockenfeller (D)	+31.315s
8	T. Glock (D)	+1m 06.250s
9	B. Spengler (CDN)	+1m 08.538s
10	M. Engel (D)	+1m 12.117s

Laps 32

Pole position T. Glock, 1m 31.406s

Fastest race lap

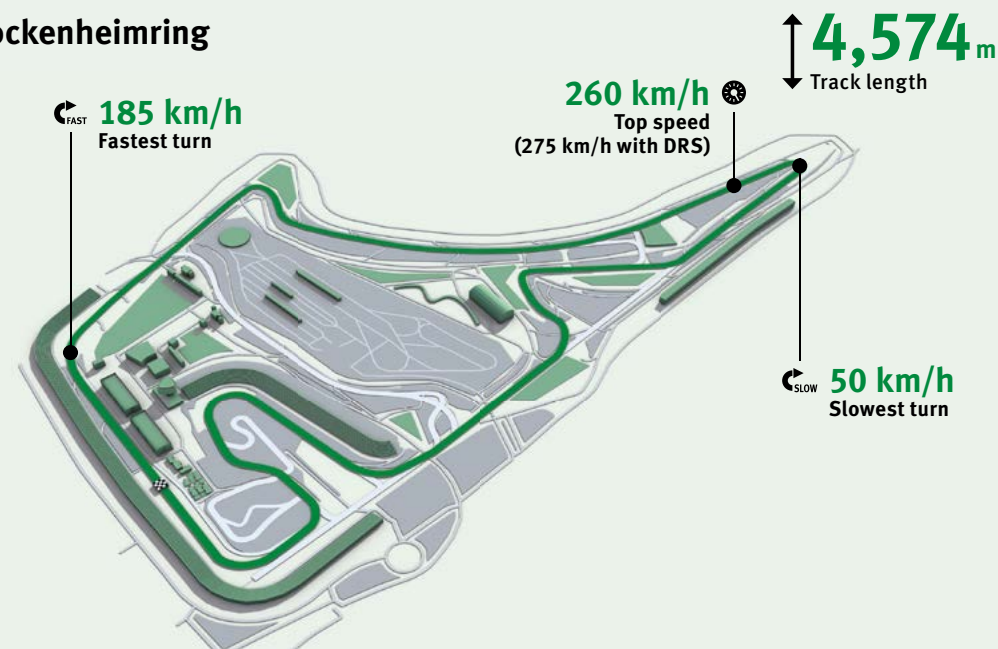
J. Green, 1m 33.614s



"It's mega cool to stand on podium again and take a trophy home"

#99 Mike Rockenfeller

Hockenheimring



Fightback driver



Three-way battle In the DTM, three brands – Audi, BMW and Mercedes-Benz – have been competing since the 2012 season

Saturday

It worked once, so why shouldn't it a second time? Audi Sport Team Phoenix adopts this maxim for tackling the first race at Lausitzring. After starting from position eight, Mike Rockenfeller heads for his pit stop as early as on lap eight – similarly early as in the Hockenheim season opener. And, again, this tactical move leads to success. After the field has sorted itself, Rocky is in position five which he defends up until the finish.

Phoenix in race two proves that this strategy – referred to as an undercut in racing parlance – can be taken to extremes. As early as at the end of lap one, the Schaeffler Audi RS 5 DTM turns into the pit lane for its mandatory stop. Up until lap seven, Mike Rockenfeller is running in the last position – yet always knowing that most of his opponents still have to stop. Rocky little by little advances on the table. On the 26th of 43 laps, just like at the finish, he's again fifth at the Lausitzring. ■

Sunday

25,000

people can be seated in the main grandstand at the Lausitzring, which makes it the largest one of its kind in Germany



Race 1

P	Driver	Time
1	L. Auer (A)	56m 37.503s
2	R. Wickens (CDN)	+3.613s
3	R. Rast (D)	+12.581s
4	M. Martin (B)	+17.660s
5	M. Rockenfeller (D)	+17.810s
6	G. Paffett (GB)	+20.253s
7	E. Mortara (I)	+21.366s
8	M. Ekström (S)	+22.319s
9	M. Engel (D)	+26.361s
10	J. Green (GB)	+29.960s

Laps 43

Pole position L. Auer, 1m 16,193s

Fastest race lap

R. Rast, 1m 17,343s

Race 2

P	Driver	Time
1	J. Green (GB)	56m 20.480s
2	M. Ekström (S)	+6.295s
3	R. Wickens (CDN)	+7.034s
4	G. Paffett (GB)	+7.387s
5	M. Rockenfeller (D)	+9.750s
6	N. Müller (CH)	+13.039s
7	R. Rast (D)	+16.370s
8	M. Martin (B)	+18.115s
9	M. Wittmann (D)	+19.540s
10	L. Auer (A)	+26.283s

Laps 43

Pole position R. Wickens, 1m 16.299s

Fastest race lap

R. Rast, 1m 17.098s

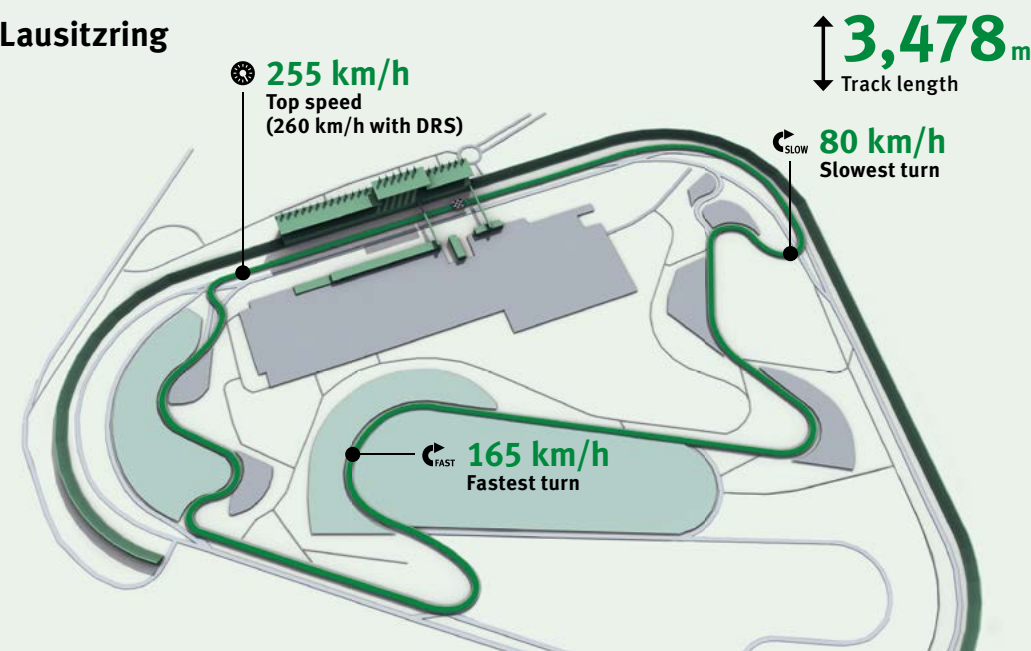


“Qualifying wasn’t so ideal in either session but in the race we nicely made up ground”

#99 Mike Rockenfeller



Lausitzring



R 5

R 6

June 17/18, 2017

Budapest 

Points collector



“Flatfish” The Schaeffler Audi RS 5 DTM thrives on sophisticated aerodynamics



Saturday

What if. Early pit stops helped Mike Rockenfeller score good results on the first two race weekends. Had this strategy been used in race one at the Hungaroring as well Rocky more than likely could have scored his first victory of the season here. Instead, he's in a good fourth place in the early stage before a safety car period mixes up the field. All the drivers with early stops can make up their deficits without being in a rush. This advantage primarily benefits the two BMW drivers Timo Glock and Bruno Spengler, and Mercedes campaigner Paul Di Resta. In the second half of the race, Rockenfeller is the fastest of all drivers and pulls clear of a number of rivals – except this trio.

No luck in race one, plus misfortune in race two. The grid reflects Rockenfeller in a strong fifth place on paper. However, shortly before the race, his mechanics detect a leaking brake line on the Schaeffler Audi RS 5 DTM. Due to the delay caused by the repair, Rockenfeller is unable to take his actual position but has to start from the rear of the field. Thanks to a lightning-fast start, an early stop and very fast lap times, he manages to advance to tenth place at the finish. The string of positions in the points continues. ■

Sunday

6

times in six races Rocky finished in the points and thus more often than in the whole previous season

“I extracted the maximum from myself. My car was fast and the race was great fun”

#99 Mike Rockenfeller



Race 1

P	Driver	Time
1	P. Di Resta (GB)	57m 52.984s
2	T. Glock (D)	+1.393s
3	B. Spengler (CDN)	+4.598s
4	M. Rockenfeller (D)	+4.948s
5	M. Ekström (S)	+8.937s
6	R. Rast (D)	+9.561s
7	G. Paffett (GB)	+31.014s
8	M. Wittmann (D)	+31.577s
9	E. Mortara (I)	+32.651s
10	N. Müller (CH)	+33.106s

Laps 34

Pole position R. Rast, 1m 34.742s

Fastest race lap

M. Rockenfeller, 1m 37.101s

Race 2

P	Driver	Time
1	R. Rast (D)	58m 01.592s
2	M. Ekström (S)	+1.041s
3	M. Martin (B)	+1.506s
4	N. Müller (CH)	+1.861s
5	J. Green (GB)	+5.772s
6	P. Di Resta (GB)	+7.884s
7	T. Glock (D)	+8.694s
8	R. Wickens (CDN)	+11.999s
9	G. Paffett (GB)	+12.653s
10	M. Rockenfeller (D)	+13.159s

Laps 35

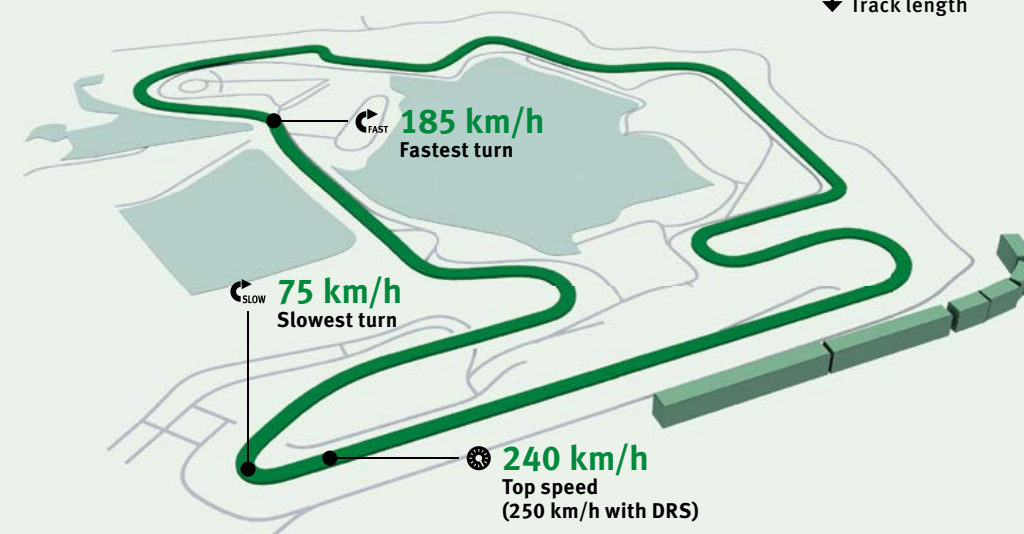
Pole position R. Rast, 1m 34.740s

Fastest race lap

M. Ekström, 1m 36.725s

Hungaroring

↑ **4,381 m**
Track length



Lucky under the circumstances In this massive crash,
Mike Rockenfeller got off relatively lightly



Moment of *shock*

R 7

R 8

July 1/2, 2017

Norisring 

Saturday

A regular turnout of more than 100,000 spectators throughout the weekend, the city street circuit in the heart of Nuremberg, located directly on the "Dutzendteich" lake – it's not for no reason that the event at the Norisring is dubbed the "Monaco of the DTM." So, actually, it's the pinnacle event on the DTM calendar: an event to enjoy for fans as well as drivers. For Mike Rockenfeller, though, it was to turn into the opposite. In Saturday's race, he's in position six at first but then instructed by race control to let three competitors pass him because of an evasive maneuver on the inside during the commotion in turn one. Subsequently, Rocky receives a drive-through penalty due to a collision with Mercedes rival Edoardo Mortara. Position 13 is all that's possible – the first race this season without points.

Due to its characteristics as a city street race, the Norisring event has produced a number of dramatic scenes in recent decades. In 2017, Mike Rockenfeller is right in the middle of one. About halfway through the race, Gary Paffett loses control of his Mercedes, initially touches the barrier, skids out of control across the tarmac and then hits the side of Mike Rockenfeller's car. Rocky sustains a fracture on his left midfoot. Fortunately, except for that, the Schaeffler campaigner is okay.

Sunday

220

grams is the weight of the Schaeffler Vision RCCO race car (pictured, front left) that's fielded in the RCCO Slot Car Championship



"I'm happy that
our cars are so safe"

#99 Mike Rockenfeller

Race 1

P	Driver	Time
1	B. Spengler (CDN)	53m 15.532s
2	M. Martin (B)	+4.385s
3	M. Ekström (S)	+4.776s
4	M. Wittmann (D)	+10.812s
5	T. Glock (D)	+12.151s
6	T. Blomqvist (GB)	+12.828s
7	J. Green (GB)	+18.573s
8	E. Mortara (I)	+20.328s
9	N. Müller (CH)	+21.355s
10	G. Paffett (GB)	+34.707s

Laps 61

Pole position M. Martin, 47.472s

Fastest race lap

T. Blomqvist, 48.345s

Race 2

P	Driver	Time
1	M. Martin (B)	1h 29m 22.150s
2	L. Auer (A)	+2.903s
3	E. Mortara (I)	+4.460s
4	M. Ekström (S)	+4.462s
5	M. Wittmann (D)	+4.487s
6	P. Di Resta (GB)	+5.708s
7	A. Farfus (BR)	+11.613s
8	J. Green (GB)	+12.064s
9	T. Blomqvist (GB)	+12.694s
10	T. Glock (D)	+13.347s

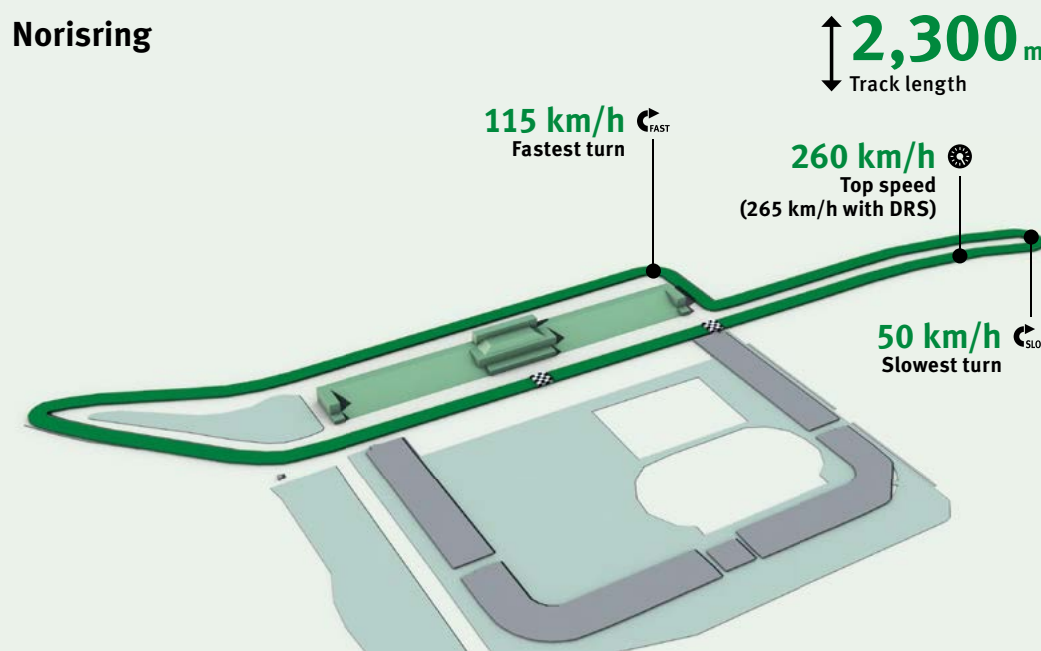
Laps 66

Pole position T. Blomqvist, 47.252s

Fastest race lap

B. Spengler, 47.846s

Norisring





Masterful
feat



Saturday

For a long time it's unclear if the three-week break between the Norisring weekend and the subsequent event in Russia will be sufficient for Mike Rockenfeller's recovery. The decision is only made on the morning of the first race day in Moscow: Rocky will run. Although his broken foot has not completely healed yet a special bandage for his left racing shoe helps against the pain. A DTM driver uses his right foot on the accelerator pedal and normally brakes with the left foot. In Russia, Rocky does both with his right foot.

And it works like a charm. In qualifying, he achieves the second-fastest time. In the race, he maintains this position and, as a result, celebrates an impressive comeback under difficult conditions.

On the second day of the event, Mike Rockenfeller is stranded in position 14 in the battle against the clock. In the race, he shows his fighting spirit once again. Thanks to clever team tactics and a number of overtaking maneuvers, he's headed for points shortly before the end of the race. The drivers in positions three to 14 complete the last laps like pearls on a string. Rocky finishes seventh. However, due to a retroactive 5-second time penalty, Rockenfeller drops to position twelve and goes home empty-handed.

Sunday

"Thank you to Audi, my team, my doctors, my physiotherapists and all the others who made it possible for me to drive here"

#99 Mike Rockenfeller



July 22/23, 2017

Moscow 

Race 1

P	Driver	Time
1	R. Rast (D)	57m 50.085s
2	M. Rockenfeller (D)	+0.770s
3	M. Wittmann (D)	+3.899s
4	R. Wickens (CDN)	+6.098s
5	T. Glock (D)	+9.498s
6	L. Auer (A)	+14.663s
7	G. Paffett (GB)	+17.696s
8	M. Ekström (S)	+17.795s
9	J. Green (GB)	+24.310s
10	M. Engel (D)	+25.329s

Laps 38

Pole position R. Rast, 1m 27.155s

Fastest race lap

R. Wickens, 1m 29.573s

Race 2

P	Driver	Time
1	M. Engel (D)	56m 41.087s
2	M. Ekström (S)	+0.376s
3	B. Spengler (CDN)	+3.981s
4	R. Rast (D)	+4.702s
5	J. Green (GB)	+5.410s
6	M. Wittmann (D)	+7.192s
7	T. Blomqvist (GB)	+8.391s
8	L. Auer (A)	+8.564s
9	R. Wickens (CDN)	+8.982s
10	E. Mortara (I)	+9.942s

Laps 36

Pole position B. Spengler, 1m 26.579s

Fastest race lap

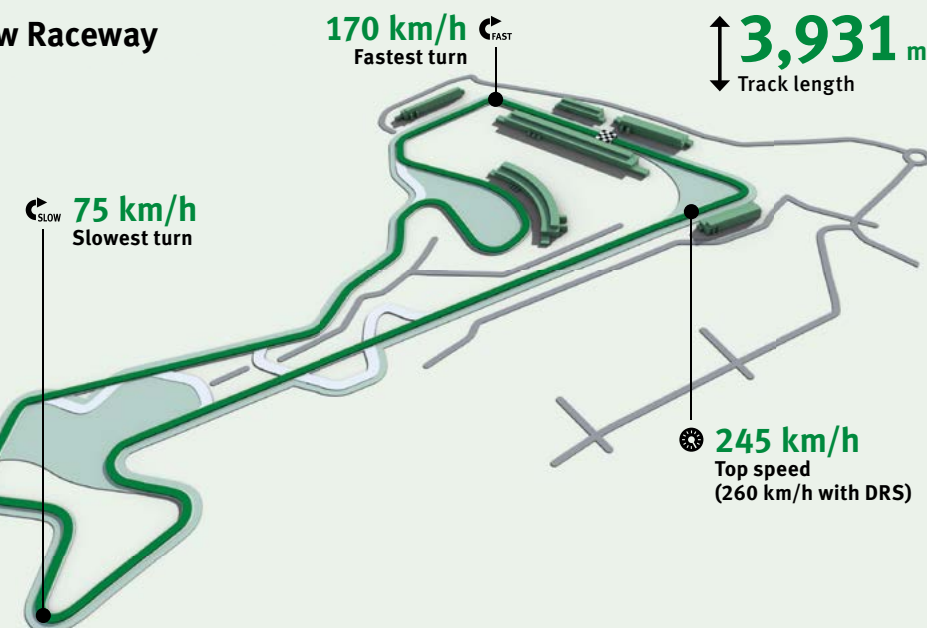
J. Green, 1m 28.436s

2

first places – this is Mike Rockenfeller's track record at Moscow Raceway, which makes him the record winner there



Moscow Raceway



August 19/20, 2017

Zandvoort 

Winner

Phoenix joy After his victory, Mike Rockenfeller jubilates with his teammate Loïc Duval who comes second

R 11 R 12

August 19/20, 2017

Zandvoort 

Saturday

During the four-week summer break, Mike Rockenfeller's recovery makes further progress: "After my foot injury, I can brake with my left foot again. It's not ideal yet, but getting better and better." Besides Moscow Raceway, Circuit Zandvoort located right on the North Sea beach is an equally successful track for the Schaeffler campaigner. In 2011, he celebrated his first-ever DTM victory and finished on podium in the two subsequent years. In a typically close qualifying session, Rocky secures position nine on the grid. Due to a heavy rain shower, all the drivers can only use one set of fresh tires. In the race, Rockenfeller overtakes a few rivals and quickly closes the gap to the three leading BMW cars but is unable to pass them before the checkered flag falls: position four and best Audi driver.

Sunday

The starting base for race twelve of the season is a little better: grid position six.

Directly after the race is started, Mike Rockenfeller shoots forward to fourth place. Even within lap one, he makes up two more places and sticks to the heels of DTM title defender Marco Wittmann. The two race leaders stop late on the tire-eating track. It's the right strategy. In the second half of the race, the two fight a lone battle. In the end, Rockenfeller doesn't manage to get past Wittmann. Second place – supposedly – because the BMW driver is retroactively excluded from the classification due to insufficient residual fuel in his tank. Rockenfeller is the lucky heir to first place.



35

races – this is how long Mike Rockenfeller waited for his fifth DTM victory in total. His most recent win had been in Moscow in 2015

Race 1

P	Driver	Time
1	T. Glock (D)	57m 18.491s
2	M. Wittmann (D)	+0.178s
3	M. Martin (B)	+0.840s
4	M. Rockenfeller (D)	+2.530s
5	J. Green (GB)	+3.164s
6	A. Farfus (BR)	+4.173s
7	P. Di Resta (GB)	+4.771s
8	G. Paffett (GB)	+5.382s
9	R. Rast (D)	+5.911s
10	N. Müller (CH)	+6.278s

Laps 37

Pole position T. Glock, 1m 27.823s

Fastest race lap

R. Rast, 1m 30.160s

Race 2

P	Driver	Time
1	M. Rockenfeller (D)	56m 33.404s
2	L. Duval (F)	16.581s
3	M. Ekström (S)	58.073s
4	N. Müller (CH)	58.620s
5	G. Paffett (GB)	58.848s
6	M. Martin (B)	59.390s
7	T. Glock (D)	59.928s
8	A. Farfus (BR)	1m 00.069s
9	J. Green (GB)	1m 02.405s
10	B. Spengler (CDN)	1m 12.009s

Laps 37

Pole position A. Farfus, 1m 27.475s

Fastest race lap

L. Duval, 1m 29.168s

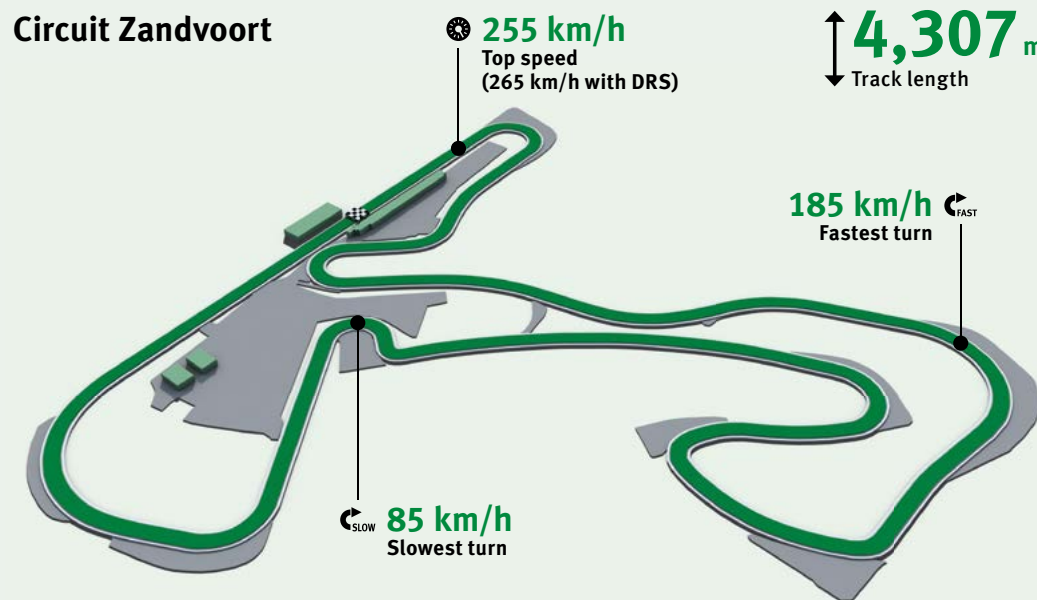
"On the whole, it was a good weekend for me.

We can be very happy with it"

#99 Mike Rockenfeller



Circuit Zandvoort



Manual labor The mechanics of Audi Sport Team Phoenix give their all during a mandatory pit stop


A low-angle, wide shot of a pit stop at the Nürburgring circuit. In the foreground, a mechanic in a red racing suit is bent over, working on the rear wheel of a yellow and green Audi race car. Another mechanic in a red suit is standing nearby, holding a large black tire. In the background, another mechanic is working on the front wheel of the car. The pit building is visible in the background, with a balcony where several people are watching. The car has 'Hankook' and 'Castrol EDGE' branding. The word 'Setback' is written in large white letters across the bottom of the image.

Setback



R 13 R 14

September 9/10, 2017

Nürburgring 

1984

is the first year in which the Nürburgring appears on the DTM calendar. Ever since the series' debut, it has been the only circuit to have been represented each season

Saturday

Points scored six times in a row at the beginning of the season, remarkable fight-backs shown in the process, a serious accident survived relatively unharmed, best points score of all drivers at Zandvoort including the first victory of the season, position three overall in the drivers' standings – up to this point, Mike Rockenfeller's DTM season can be called a successful one. The Schaeffler campaigner practically hasn't had to accept any defeats so far: up until the Nürburgring event – the round on home soil for Audi Sport Team Phoenix of all places. On the wet first race day, nearly all Audi drivers are stranded in the rear positions of the grid, Mike Rockenfeller takes position 14. The same result the race ends in as well.

No improvement in sight on day two. This time, in dry conditions, the Audi squad even fares worse in qualifying. Five drivers of the "four rings" are assembled in the last six positions of the grid – among them Mike Rockenfeller. After two tire changes in the race he ultimately finishes in position 17. "We were off the mark with our setup in all conditions," he sums up the event. "On Sunday, I completely went down with the tires. That's never happened to me this year. We're going to learn from this and then look ahead to Spielberg."

Sunday

"A race to forget. That was by far my worst weekend this season"

#99 Mike Rockenfeller



Race 1

P	Driver	Time
1	L. Auer (A)	54m 12.443s
2	P. Di Resta (GB)	+0.794s
3	R. Wickens (CDN)	+1.568s
4	M. Engel (D)	+5.344s
5	R. Rast (D)	+9.758s
6	J. Green (GB)	+24.531s
7	E. Mortara (I)	+31.593s
8	A. Farfus (BR)	+49.335s
9	M. Wittmann (D)	+56.886s
10	G. Paffett (GB)	+59.072s

Laps 33

Pole position L. Auer, 1m 25.968s

Fastest race lap

N. Müller, 1m 31.420s

Race 2

P	Driver	Time
1	R. Wickens (CDN)	56m 49.795s
2	P. Di Resta (GB)	+0.362s
3	M. Wittmann (D)	+7.589s
4	B. Spengler (CDN)	+7.955s
5	M. Engel (D)	+15.995s
6	M. Ekström (S)	+20.549s
7	J. Green (GB)	+22.887s
8	T. Glock (D)	+40.196s
9	A. Farfus (BR)	+40.307s
10	T. Blomqvist (GB)	+41.818s

Laps 40

Pole position M. Wittmann, 1m 20.936s

Fastest race lap

R. Rast, 1m 22.308s




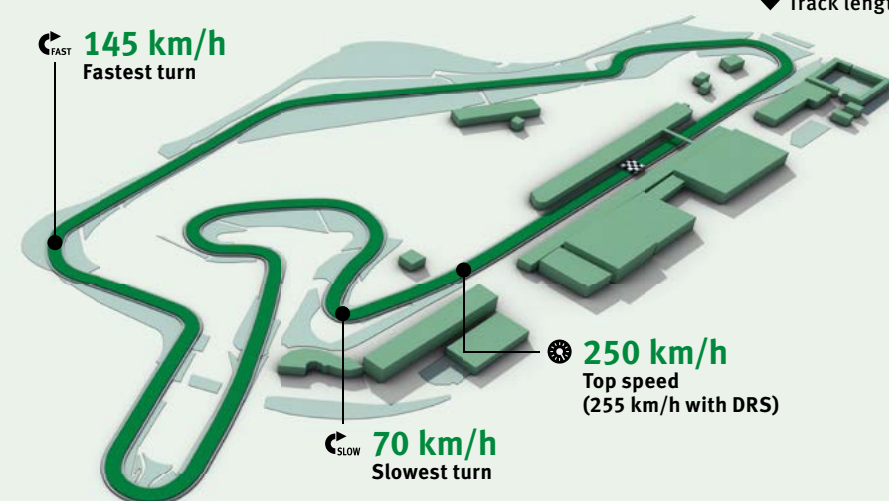
Nürburgring

 **145 km/h**
Fastest turn

 **3,629 m**
Track length

 **250 km/h**
Top speed
(255 km/h with DRS)

 **70 km/h**
Slowest turn



R 15

R 16

September 23/24, 2017


Spielberg 

Come *back*

Flashback With just one more event to go before the end of the 2017 season, Mike Rockenfeller's racing tally is positive

R 15 R 16

September 23/24, 2017

Spielberg 

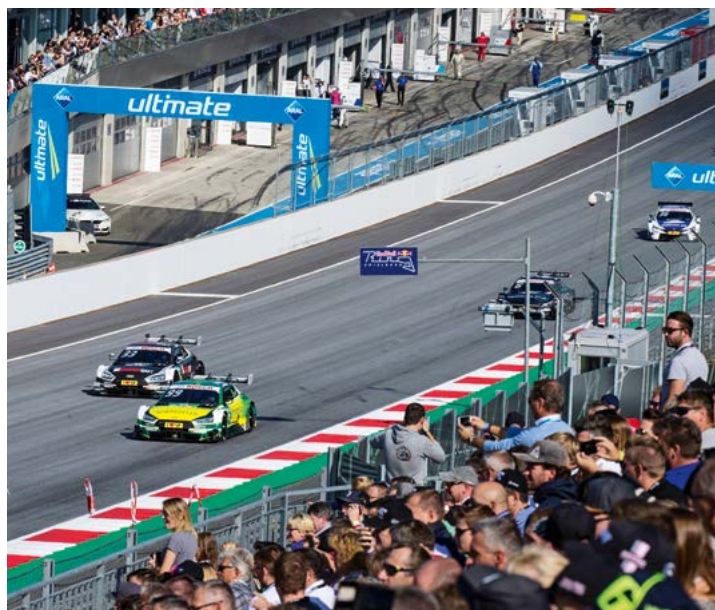
"I'm happy. I would also have been happy about third place because in the race Jamie (Green) was simply stronger on Sunday"

#99 Mike Rockenfeller



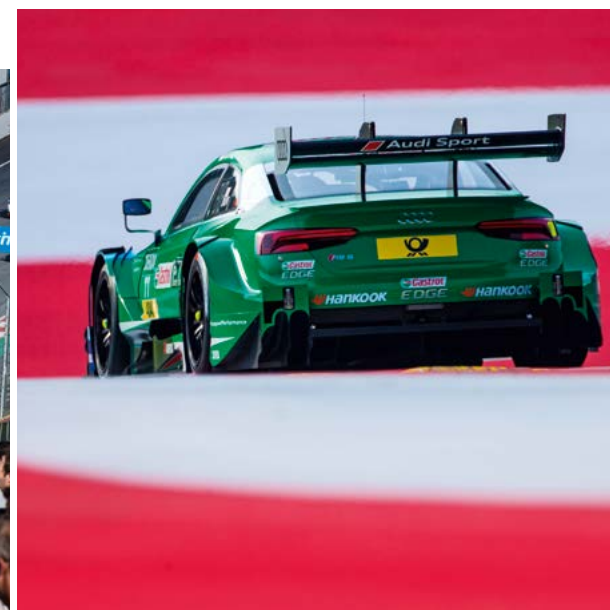
Saturday

Mike Rockenfeller's hopes of scoring better results in Austria after the unsuccessful weekend at the Nürburgring were to come true. As early as in qualifying, the picture is a totally different one. While the Audi drivers in the Eifel were exclusively in rear positions, it's hard to get past them at the Red Bull Ring. Mike Rockenfeller qualifies for the third row on the grid. After a middling start, Rocky only finds himself in position eight on lap one. His team calls him in for the mandatory pit stop early. Toward the end of the race, the cars in positions four to 15 are within five seconds of each other. From this "battle squad" Rocky emerges as the seventh to see the checkered flag.



From fourth place, his second-best qualifying result this season, Mike Rockenfeller tackles race two in Styria. The 33-year-old makes the latest stop of all drivers in the front-running group and takes the lead for a short time. During the pit stop stage, Rocky loses a few positions due to degrading tires. On a fresh set and following a safety car period, he picks up momentum again and in the final stage even overtakes leader of the standings Mattias Ekström and title defender Marco Wittmann. Position three seems to be locked in concrete. Shortly before the end, fellow Audi driver Jamie Green, in position two up to that point, drops far behind due to shifting issues and Rockenfeller is happy about seeing the checkered flag in second place. In both races, Audi drivers celebrate a one-two-three victory. ■

Sunday



Race 1

P	Driver	Time
1	M. Ekström (S)	57m 00.812s
2	J. Green (GB)	+0.398s
3	N. Müller (CH)	+0.602s
4	R. Wickens (CDN)	+21.625s
5	M. Wittmann (D)	+22.118s
6	M. Martin (B)	+22.748s
7	M. Rockenfeller (D)	+23.067s
8	L. Auer (A)	+23.452s
9	E. Mortara (I)	+23.761s
10	T. Glock (D)	+25.559s

Laps 40

Pole position J. Green, 1m 21.973s

Fastest race lap

J. Green, 1m 23.742s

Race 2

P	Driver	Time
1	R. Rast (D)	57m 21.893s
2	M. Rockenfeller (D)	+1.025s
3	N. Müller (CH)	+1.824s
4	G. Paffett (GB)	+3.741s
5	M. Ekström (S)	+6.136s
6	M. Wittmann (D)	+7.968s
7	T. Glock (D)	+8.181s
8	L. Duval (F)	+8.457s
9	P. Di Resta (GB)	+9.328s
10	R. Wickens (CDN)	+11.305s

Laps 39

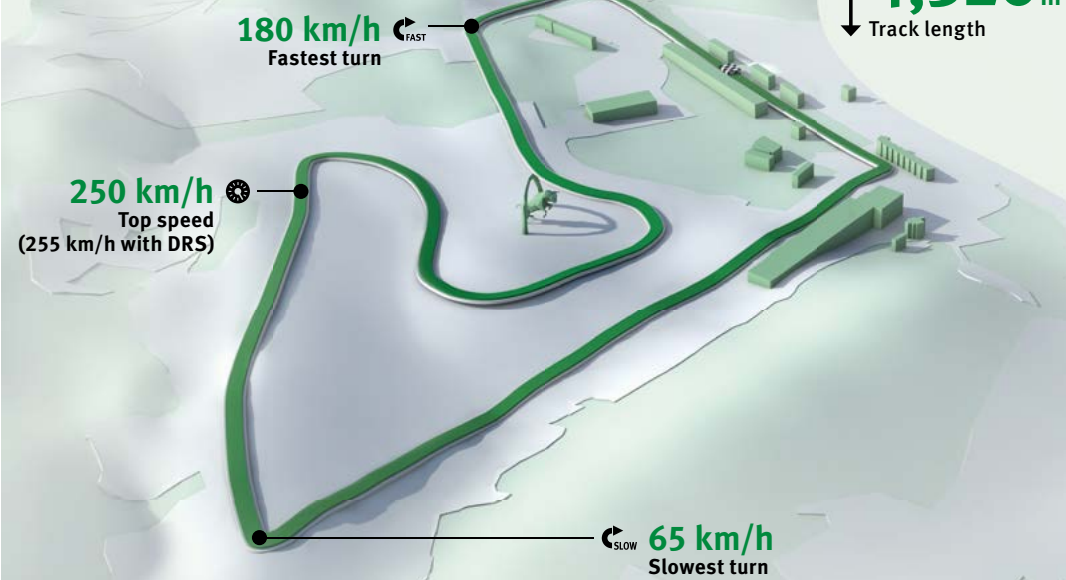
Pole position J. Green, 1m 21.955s

Fastest race lap

J. Green, 1m 23.474s

Audi cars are in front in both races. With that, and also thanks to two pole positions and two fastest race laps, the brand has managed a perfect weekend

Red Bull Ring



R 17

R 18

October 14/15, 2017

Hockenheim 

Math games



Strong finish With two podiums under his belt, Mike Rockenfeller keeps catching a whiff of the DTM champion's title up until the end



Saturday

Six drivers, Mattias Ekström (172 points), René Rast (151), Jamie Green (137), Mike Rockenfeller and Marco Wittmann (each 134) and Lucas Auer (131), still have a chance of clinching the title in the season finale at Hockenheim. Rocky's 38-point deficit is large but in the DTM, where a victory is worth 25 points, the situation is not hopeless. On the grid for race one, Jamie Green and René Rast are in positions three and four, Rocky is seventh and leader of the standings Ekström tenth. In beautiful fall weather, the fans witness spectacular asphalt action. After the pit stops, Rockenfeller is only running in position seven, but then surpasses himself. Within the last twelve laps, he starts one overtaking maneuver after the other and advances to position two. Green wins, Rast comes sixth and Ekström goes home empty-handed.



Before the 18th and final race of the season, the situation in the title race intensifies. Now there are only four title candidates left – all from a single brand – and the point gaps are even smaller: Ekström 172, Green 163, Rast 159, Rockenfeller 152. Additional spice is added by the fact that Ekström and Green receive five- and ten-place grid penalties respectively in race two following warnings in race one. Suddenly, René Rast, having come second in qualifying, is the top favorite. Rockenfeller starts from position seven. He shows a strong performance once again and advances to position three. However, in the final tally, Rocky remains in position four overall, trailing the champion, Rast, Ekström and Green.

Sunday

12

points is Rockenfeller's ultimate deficit to René Rast, making him the best fourth-placed driver since the DTM's debut year of 1984

Race 1

P	Driver	Time
1	J. Green (GB)	56m 52.478s
2	M. Rockenfeller (D)	+3.939s
3	T. Glock (D)	+5.666s
4	M. Martin (B)	+10.448s
5	E. Mortara (I)	+12.962s
6	R. Rast (D)	+14.752s
7	R. Wickens (CDN)	+16.196s
8	L. Auer (A)	+23.633s
9	G. Paffett (GB)	+24.615s
10	B. Spengler (CDN)	+25.027s

Laps 36

Pole position T. Glock, 1m 30.648s

Fastest race lap

M. Rockenfeller, 1m 32.819s

October 14/15, 2017

Hockenheim

Race 2

P	Driver	Time
1	M. Wittmann (D)	56m 47.699s
2	R. Rast (D)	+3.143s
3	M. Rockenfeller (D)	+6.280s
4	G. Paffett (GB)	+15.844s
5	J. Green (GB)	+17.835s
6	M. Martin (B)	+19.372s
7	A. Farfus (BR)	+20.386s
8	M. Ekström (S)	+21.229s
9	E. Mortara (I)	+22.902s
10	L. Auer (A)	+29.260s

Laps 36

Pole position T. Blomqvist, 1m 30.491s

Fastest race lap

J. Green, 1m 32.456s

"The team and I wanted to get out of the hole we were in last year, and we managed to do that"

#99 Mike Rockenfeller



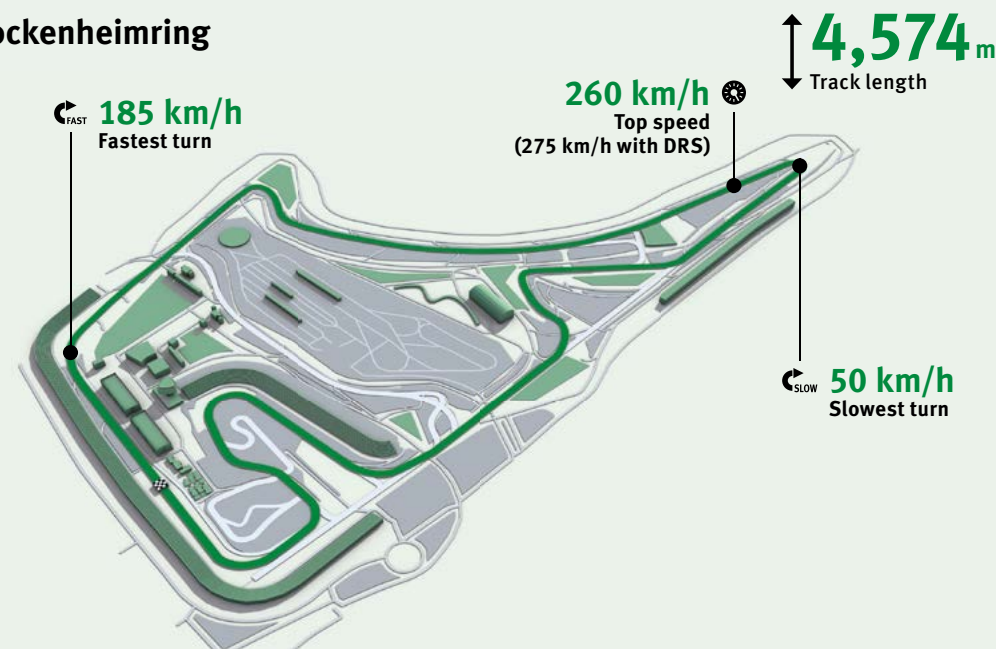
Final drivers' classification

P	Driver/Team	Pts
1	René Rast (D) Team Rosberg, Audi	179
2	Mattias Ekström (S) ABT Sportsline, Audi	176
3	Jamie Green (GB) Team Rosberg, Audi	173
4	Mike Rockenfeller (D) Phoenix Racing, Audi	167
5	Marco Wittmann (D) BMW Team RMG, BMW	160
6	Lucas Auer (A) HWA, Mercedes-Benz	136
7	Timo Glock (D) BMW Team RMG, BMW	133
8	Maxime Martin (B) BMW Team RBM, BMW	132
9	Robert Wickens (CDN) HWA, Mercedes-Benz	119
10	Gary Paffett (GB) HWA, Mercedes-Benz	102

Final teams' classification

P	Team	Pts
1	Team Rosberg, Audi	352
2	ABT Sportsline, Audi	257
3	HWA, Mercedes-Benz	221

Hockenheimring





Decision-makers Matthias Zink (left) and Prof. Peter Gutzmer are members of Schaeffler's executive board

“The DTM reaches our employees”

Prof. Peter Gutzmer, Deputy CEO and Chief Technology Officer of Schaeffler AG, and Matthias Zink, CEO Automotive of Schaeffler AG, discuss the DTM commitment of their company in an interview

As early as in the 1980s, DTM cars sporting stickers of Schaeffler's LuK product brand competed in the DTM and since 2011 an Audi completely wrapped in Schaeffler colors has been attracting attention. What's the objective behind this commitment?

Peter Gutzmer: “Schaeffler has always been an innovation driver. About three decades ago, we extended our commitment from the factories to

the race tracks in a manner of speaking in order to present our brands in the competitive motorsport environment. Not only in the DTM but also in other motorsport disciplines such as rally racing, logos of Schaeffler's LuK, FAG and INA brands have been emblazoned on many vehicles. Today, and this reflects the development of our company as well, we're communicating our brand values in motorsport under the central theme of 'One Schaeffler.'”

In 2017, Schaeffler brand ambassador Mike Rockenfeller again competed in the DTM at the wheel of an Audi. The vehicle communicates a clear message.

Peter Gutzmer: “Exactly, and it does so even in its name: Schaeffler Audi RS 5 DTM. Besides the purposely selected conspicuous color scheme, the 'Mobility for tomorrow' inscriptions are unmistakable as a visual highlight. So the graphic layout of the vehicle carries the Group's strategy of 'Mobility for tomorrow' into motorsport. Schaeffler is actively involved in designing future mobility with its innovative products and technology expertise. Appearances in motorsport – and I include those in Formula E and in the WEC – are the optimum communicators of our messages.”

In 2016, some 1,000 Schaeffler employees with banners, baseball caps and T-shirts of your company practically transformed the grandstands during the DTM season's highlight at the Norisring into a “green wall.” What kind of a feeling was that?

Matthias Zink: “A wonderful one. The Schaeffler Audi has been showing the integrative power and mojo of motorsport from day one. Our employees identify with our company via motorsport. And they do so around the globe. Posters and stickers of the Schaeffler racer are displayed in numerous production halls, our research and development sites and in offices. Whenever Mike Rockenfeller visits a Schaeffler location and our employees have the opportunity to shake his hand during personal tech talks it becomes clear that this is a perfect partnership.”

The technologies used in race cars and production vehicles in many cases are not very far apart. How do these two areas benefit from each other?

Matthias Zink: “The complexity and speed of motorsport commitments sharpen the focus on essentials and challenge our engineers to deliver feasible solutions by deadlines that are locked in concrete. In addition, motorsport promotes team spirit. All of this is beneficial in Schaeffler's day-to-day work as a globally active automotive and industrial supplier as well. The keyword is technology transfer, for instance in the field of hybridization, which is a very important topic on the road as well as in motorsport. That's why we were involved in the FIA World Endurance Championship (WEC) where we were able to demonstrate our expertise in this field together with our partner Porsche. This applies to Formula E, where the main focus is on the interaction between the electric motor and the transmission, in similar ways. Since the 2015/2016 season, Schaeffler, as the exclusive technology partner, has been developing the powertrain of the race cars together with Team ABT Schaeffler Audi Sport.”

The DTM has always been racing with classic IC engines. By contrast, electrification is the predominant topic in the automotive industry at the moment. Will IC engines have a chance in the future?

Peter Gutzmer: “Yes, absolutely. Our future lies in electric mobility but, at the same time, electric mobility is the future of the IC engine as well. As a lot of research has shown, we will not be able to achieve the established targets by 2050 by means of purely battery-based electrification. Looking at the total system, this will only be possible if we create CO₂-neutral energy carriers based on renewable energies and those will be gaseous and liquid synthetic fuels as well as hydrogen, in other words energy carriers that are ideally suited for use in an IC engine system. The future of our personal mobility will be defined by a healthy mix of hybrids, efficient IC engines and electric powertrains.” ■

Motorsport *in our genes*

Competition, momentum, vehicle control at the limit – motorsport has many facets that make it unique. But it also sharpens the senses and provides new ideas and motivation for routine tasks. All of these are reasons that motivate Schaeffler to be involved in motorsport

Be it in Formula E, the WEC or in the DTM – success in motorsport is closely tied to the ability of every individual and particularly to teamwork. Innovative prowess and dynamism, determination and courage are essential. This also applies to the daily endeavors of Schaeffler's employees and has resulted in Schaeffler successfully standing its ground

as one of the world's leading automotive suppliers. The motorsport commitment has been a substantial element of the Schaeffler brand strategy for more than three decades and is anchored in the company's genes in Herzogenaurach – as well as around the globe where Schaeffler's about 89,400 employees are active. ■

E-mobility development laboratory

The first racing series for fully electric vehicles uniquely embodies what mobility for tomorrow stands for. At Schaeffler, involvement in shaping the electrification of the automobile is one of the central forward-thinking topics. Schaeffler is one of the innovation leaders in this field and frequently a pioneer. In Formula E, Schaeffler has been on board as the exclusive technology partner of Team ABT Schaeffler Audi Sport ever since the series' inaugural season of 2014/2015. Since the second season, Schaeffler has been developing the vehicle's powertrain. The Brazilian Lucas di Grassi and the German Daniel Abt have been a well-gelled driver duo ever since the first race. Following third and second places in the final standings, di Grassi celebrated his first title win in the 2016/2017 season together with Schaeffler.



Fightback In a thrilling end-of-season stage, Schaeffler campaigner Lucas di Grassi still overtakes title defender Sébastien Buemi. At the season finale in Montreal, he celebrates one of two victories of the season



Jubilation Thanks to a second place in the penultimate race of the WEC season at Shanghai, Schaeffler and Porsche crown themselves drivers' and manufacturers' champions

High-tech hybrids

Action at close range is something that Schaeffler experienced in the FIA World Endurance Championship (WEC) as well – together with Porsche. In 2014, the team based in Weissach had returned to the top category, LMP1, following a 16-year abstinence but was not only relying on Schaeffler's expertise since then. The partnership has historically grown and, in motorsport as well as in production, dates back to the 1940s, as Schaeffler's cage-guided needle bearing was installed in Porsche's first production model, the legendary 356. The WEC provided Schaeffler with a perfect opportunity to demonstrate technological expertise. With a set of Technical Regulations that limit the amount of usable energy while allowing substantial freedom in the areas of hybrid and powertrain technology, energy efficiency and forward-thinking technology are more important than ever – topics that drive the company in terms of automotive technology, the reliability and quality of production vehicles being of major importance to Schaeffler. Together, Schaeffler and Porsche won both the drivers' and the manufacturers' world championship title in 2015, 2016 and 2017 as well as the prestigious 24-hour race at Le Mans.





Magic word *efficiency*

A technology on its way out? Not by a long shot! The IC engine is far from having reached the end of its development and will be playing a key role in mobility for tomorrow as well

The coming decades will continue to see valves opening and closing, pistons traveling up and down, and crankshafts rotating. This much is certain, the only question is: in how many cars? Legions of futurists are struggling to come up with an answer to this question. Not least because of the large number of factors, from legal requirements to infrastructures to technical developments and prices, that influence market developments. "There continues to be a high level of uncertainty about the way in which things are going to develop," says Klaus Rosenfeld, CEO of Schaeffler AG, describing the current state. Farsighted experts of the technology group assume that by 2030 a maximum of 30 percent of all automobiles will be propelled strictly by electricity. All others – in other words 70 percent and more – will have an IC engine

on board. An overestimated number? Not when taking the fact into account that hybrid-electric vehicles have IC engines as well.

Combustion still has room for improvement

Especially because IC engines will be a driving force in mobility for tomorrow it's important to make them fit for the future. Engineers at Schaeffler are working on projects that aim to maximize the output delivered by the amount of energy employed. And, by the way, they've been doing so for decades (see info column, right). There's still considerable room for improvement, as only a fifth of the power in a fuel tank is actually put on the road at the moment. "We estimate the entire efficiency enhancement potential to be no less than 20 percent for

gasoline and 10 percent for diesel engines," reveals Schaeffler's Chief Technology Officer Prof. Peter Gutzmer. Industry experts are in agreement that a single measure to achieve this does not exist. The reduction of fuel consumption requires a large number of individual ideas and improvements, in the IC engine itself and in the drivetrain.

This is how Schaeffler enhances efficiency

Reducing friction is one of these measures. Here Schaeffler leverages its wide-ranging know-how as a manufacturer of rolling bearings as well as its expertise in surfaces and coatings. In engine technology, for instance, fully variable "UniAir" valve control, the production of which Schaeffler launched in 2009 and has continuously improved ever since, significantly enhances efficiency. Combined with engine downsizing, the system makes it possible to reduce fuel consumption and CO₂ emissions by up to 25 percent. In addition, UniAir expands the possibilities of situational and demand-based engine operation. As a result, modern combustion strategies such as "Miller" and "Atkinson" can be achieved. Cylinder deactivation is possible without the need for any additional engineering modifications as well. In addition, Schaeffler's electro-mechanical camshaft adjuster enhances efficiency compared with conventional hydraulic systems. Not only with cylinders, Schaeffler pursues the simple approach to saving of "shutting everything off that's not needed at the moment." All-wheel drive disconnect clutches, start-stop systems or electric clutches – the portfolio of the automotive and industrial supplier includes all of these. Another piece of the optimization puzzle: the thermal management module launched in 2011 that helps IC engines and transmissions reach their ideal temperature windows faster.

Actually, whether IC engines or electric motors will prevail is not the question at Schaeffler. A more appropriate statement would be that there will be both: IC engines and electric motors because without electrification/hybridization even mid-size cars like the Audi A5 will not be able to comply with future CO₂ limits. ■

3 examples from decades

Innovations for more efficiency
(Percentage: fuel savings)

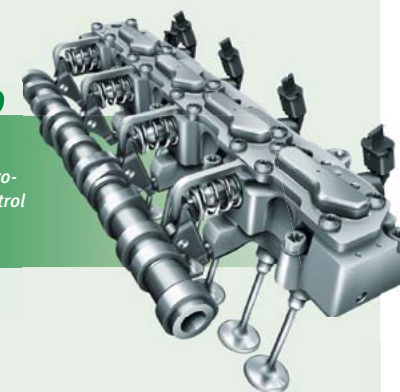


22%

1985
Dual-mass flywheel (DMF) with centrifugal force pendulum absorber

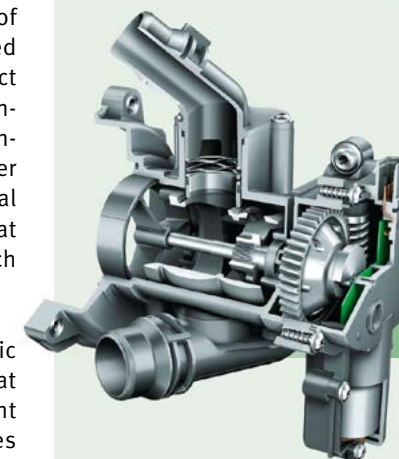
25%

2009
Fully variable electro-hydraulic valve control (UniAir)



4%

2011
Thermal management module



Always focused on progress Schaeffler has a decades-long track record of delivering innovations to reduce the fuel consumption and emissions of IC engines, which enhances their efficiency

From *day one*



Schaeffler and Audi have been longstanding partners not only in the DTM – in the field of production automobiles, the two German automotive heavyweights have been teaming up for many decades as well

Both in the DTM and in the Formula E electric racing series, Schaeffler and Audi have jointly celebrated major successes. By developing the entire powertrain for the race car of Team Audi Sport ABT Schaeffler, Schaeffler is involved in shaping mobility for tomorrow as well. The same is true off the race track, as the successful partnership between Schaeffler and Audi has been in existence for several generations.

As far back as in 1950, Schaeffler's cage-guided needle bearing is installed in the DKW F89 made by Auto Union, a company that preceded today's AUDI AG. It turns into a million-seller within a very short period of time. Across the following decades, Schaeffler and Audi intensify their collaboration. Since the mid-1960s, clutches by Schaeffler's LuK brand are used at Audi as well. In the 1980s,

the efficiency of the clutches is enhanced by stiffer designs, for the Audi 100, among others. In 1993, the self-adjusting clutch (SAC) goes into production, debuting in the Audi S4 Bi-Turbo. The continuously variable transmission, the thermal management module or the electromechanical roll stabilizer – listed on the following page are other important technology milestones achieved in the partnership between Schaeffler and Audi.

Know-how and ingenuity

Not only the people at Audi, but those at all automobile manufacturers around the globe, rely on Schaeffler's active support. With the ingenuity of its development engineers and its concentrated manufacturing know-how, the group has been decisively influencing progress in global automotive technology. ■



Auto Union DKW F89 1950

In 1949, Georg Schaeffler achieves a breakthrough invention, the **#Cage-Guided #INA Needle Bearing**. It offers reduced friction and torque stability which revolutionize the roller bearing market. In 1950, it is first used in the Auto Union DKW F89 dubbed as "Meisterklasse" ("Master Class").



Audi 50 from 1974

The **#Diaphragm Clutch** introduced into automobiles by Schaeffler's LuK brand in the mid-1960s displaces the preceding unit with helical springs from the passenger car market. As well as in other models, Audi uses the technology in its compact Audi 50, enabling the Four Rings to tap into new consumer groups.



Audi 80 quattro 1986

Today's Schaeffler ambassador Armin Schwarz, on winning the title in the 1986 Mitropa Rally Cup, achieves his breakthrough in international rally racing. In his Audi 80 quattro sporting conspicuous graphics of Schaeffler's INA brand, numerous new **#Valve Train Components** are tested.



Audi A4 from 1995

The **#Overrunning Alternator Pulley** debuts in the Audi A4. Today, it is installed in practically any efficient car, stabilizing rotational irregularities in the belt drive. The result: smoother running and enhanced NVH performance.



Audi A6 from 1999

The **#Continuously #Variable #Transmission** is enabled thanks to a high-tech engineering design from Schaeffler. Featured in the legendary "bobblehead" TV commercial, the technology which Audi calls "Multitronic" acquires fame.



Audi A4 DTM 2007

In many motorsport disciplines, such as in the DTM on Mike Rockenfeller's Audi A4 DTM, logos of Schaeffler's LuK, FAG and INA brands are emblazoned on the cars. Today, the company's appearance at the race track is billed as **#OneSchaeffler**.



Audi A5 Sportback from 2007

Schaeffler's **#Thermal Management Module** controls temperature management in the entire powertrain. This allows the ideal thermal condition of the engine and transmission to be achieved as soon as possible and fuel economy to be enhanced.



Audi TT 2014

In the "Schaeffler System 48 V" **#Concept Vehicle** based on an Audi TT, Schaeffler demonstrates the potential of 48-volt hybridization. An electric rear axle complements the IC engine and recuperates braking energy at the same time.



Audi SQ7 from 2016

The **#Electromechanical #Roll Stabilizer** from Schaeffler enhances safety, vehicle dynamics and ride comfort, for instance in the current Audi SQ7. In 2016, the pioneering component receives a "German Innovation Award."

Mobility for *tomorrow*

For Schaeffler, innovation has been part of its corporate DNA ever since the company was founded. Lateral and interdisciplinary thinking is part of the program



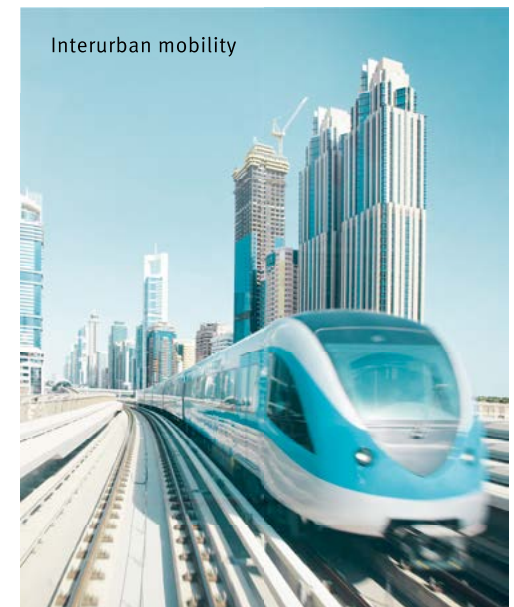
Energy chain



Eco-friendly powertrain technologies



Urban mobility



Interurban mobility

Schaeffler is known as an innovation leader delivering a wealth of technologies that make automobiles more fuel-efficient, environmentally friendly and safer. Additionally, the company offers products for trains, aircraft, wind turbines and many other industrial sectors. Schaeffler can be found wherever things are in motion. And motion means mobility as well. The challenges facing mobility of the future are immense. That's why Schaeffler is committed to its holistic "Mobility for tomorrow" strategy concept geared to finding sustainable solutions for the world of tomorrow. ■

"Progressive climate change, increasing urbanization and globalization, as well as digitalization will have a substantial impact on our lives and work. This particularly applies to the field of mobility"

Klaus Rosenfeld,
Chief Executive Officer Schaeffler

Schaeffler in the DTM

2011–2017

2

drivers' title

1

teams' title

3

manufacturers' title

94

races

7

wins

25

trophies

6

fastest race laps

6

Pole-Positions

396

laps led

652

points

11

race tracks

23

races led



Learn more about
mobility for
tomorrow

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- DTM
- @dtm
- dtm.com
- dtm_pics

Mike Rockenfeller

- mikerockenfeller
- @m_rockenfeller
- mike-rockenfeller.de
- mike_rockenfeller

Contact

Schaeffler Technologies AG & Co. KG
Jörg Walz
Communications and Marketing
Schaeffler Automotive
Industriestr. 1–3
91074 Herzogenaurach
presse@schaeffler.com

