



BMW M HYBRID V8 MEDIA GUIDE.

2023 IMSA WEATHERTECH SPORTSCAR CHAMPIONSHIP.

BMW M Motorsport



STATEMENTS.

This is an interactive brochure.
Click on the tabs below for example to choose a specific chapter.



Franciscus van Meel,
CEO of BMW M GmbH

"We are proud that we are returning to the big motorsport stage with the BMW M Hybrid V8. BMW has a successful history in prototype racing – the Le Mans victory in 1999 was unforgettable. Reviving this story in a modern prototype with M Power will thrill BMW M Motorsport fans. The LMDh concept guarantees maximum cost control and offers a wide range of possible applications. We are all eager to get stuck into the LMDh category with a compact and highly-efficient team set-up and are delighted that this adventure begins in North America, the most important international market for BMW M GmbH. After all, the BMW M Hybrid V8 is more than just a race car, it is paving the way for an electric future for BMW M, by emphatically demonstrating how dynamic and emotional electrified M Power can be."

"Being back in the top class of motorsport and battling for overall victories at such legendary races as Daytona, Sebring and Road Atlanta is both a major challenge and huge motivator for everyone at BMW M Motorsport. We have worked very hard in recent months to get the BMW M Hybrid V8 ready for racing in a short time. Thank you to all our partners at Dallara, BMW M Team RLL, our development team RMG, and BMW Group Designworks for the fantastic support with assembling, developing and testing the car. And thank you to our sponsoring partners as well. Without their support it wouldn't be possible to run such a project. The BMW M Hybrid V8 is a beautiful race car. It is our job to make it fast. We are working towards achieving this goal day by day."



Andreas Roos,
Head of
BMW M Motorsport

BMW M HYBRID V8.

ENTERING A NEW ERA.



In a meeting on 10th June 2021, the BMW Group Board of Management gave the green light for BMW M Motorsport to enter a new era of racing, the LMDh prototype class. From 2023, the BMW M Hybrid V8 will compete for overall victories in the IMSA WeatherTech SportsCar Championship and from 2024, the first BMW M Motorsport prototype since the legendary BMW V12 LMR will race in the FIA World Endurance Championship and return to the 24 Hours of Le Mans – exactly 25 years after the last BMW victory at the most famous endurance race in the world.

Continuing the BMW M Motorsport success story on the racetrack is only one driving force behind the BMW M Hybrid V8. The development of the first high-performance hybrid powertrain by BMW M makes the BMW M Hybrid V8 the flagship project for the transformation of BMW M cars towards electric mobility. It showcases the aim of the developers to not only preserve the unmistakable performance characteristics of BMW M models, but at the same time enrich them with new facets of driving pleasure. Driving a BMW M car, be it on the road or on the racetrack, will always remain an emotive experience, also with hybrid or fully electric powertrains.



The Management Board's decision in favour of the LMDh project kicked off a very short and intensive development phase. BMW M Motorsport chose Dallara as chassis partner and decided which combustion engine to use as the base model for the hybrid powertrain.

The roll-out of the BMW M Hybrid V8 took place on 25th July 2022 on the Dallara test track at Varano de' Melegari followed by an intensive test programme, first in Europe and from September 2022 in North America, where BMW M Team RLL will race with two cars in 2023.

During a launch event at the Petersen Museum in Los Angeles on 22nd September 2022, the works livery and the drivers for the 2023 IMSA season were presented to the public.

While BMW M Team RLL will race the BMW M Hybrid V8 in North America from 2023, BMW M Team WRT will prepare for the debut of the car in the FIA WEC in 2024.

BMW M HYBRID V8.

TIMELINE.



10th June 2021

BMW Group Board decision to enter the LMDh class

Watch Mbedded video.

June 2021 – June 2022

Combustion engine design and build-up

13th November 2021

Announcement of BMW M Team RLL to run the car in the IMSA series

Watch Mbedded video.

August 2022

Testing phase 1 in Europe

2nd August 2022

Announcement of BMW M Team WRT to run the car in the FIA WEC

Watch Mbedded video.

September – December 2022

Testing phase 2 in North America

26th September 2022

Launch of BMW M Hybrid V8 works design and IMSA drivers

Watch Mbedded video.

June 2022

Implementation and fire-up of hybrid powertrain in the car

JUN JUL AUG SEP OCT NOV DEC JAN FEB MAR APR MAY JUN JUL AUG SEP OCT NOV DEC JAN

8th September 2021

Contract signing with chassis manufacturer Dallara

Watch Mbedded video.

September 2021 – July 2022

Chassis design and build-up of test car



25th March 2022

Fire-up of combustion engine at the dyno

Watch Mbedded video.

25th July 2022

Roll-out of the BMW M Hybrid V8

Watch Mbedded video.

26th July 2022

BMW Group Board decision to run the BMW M Hybrid V8 in the FIA WEC from 2024



20th – 22nd January 2023

Final test at the Roar before the Daytona 24

28th – 29th January 2023

Race premiere of the BMW M Hybrid V8 in Daytona

BMW M HYBRID V8.

CAR SPECIFICATIONS.



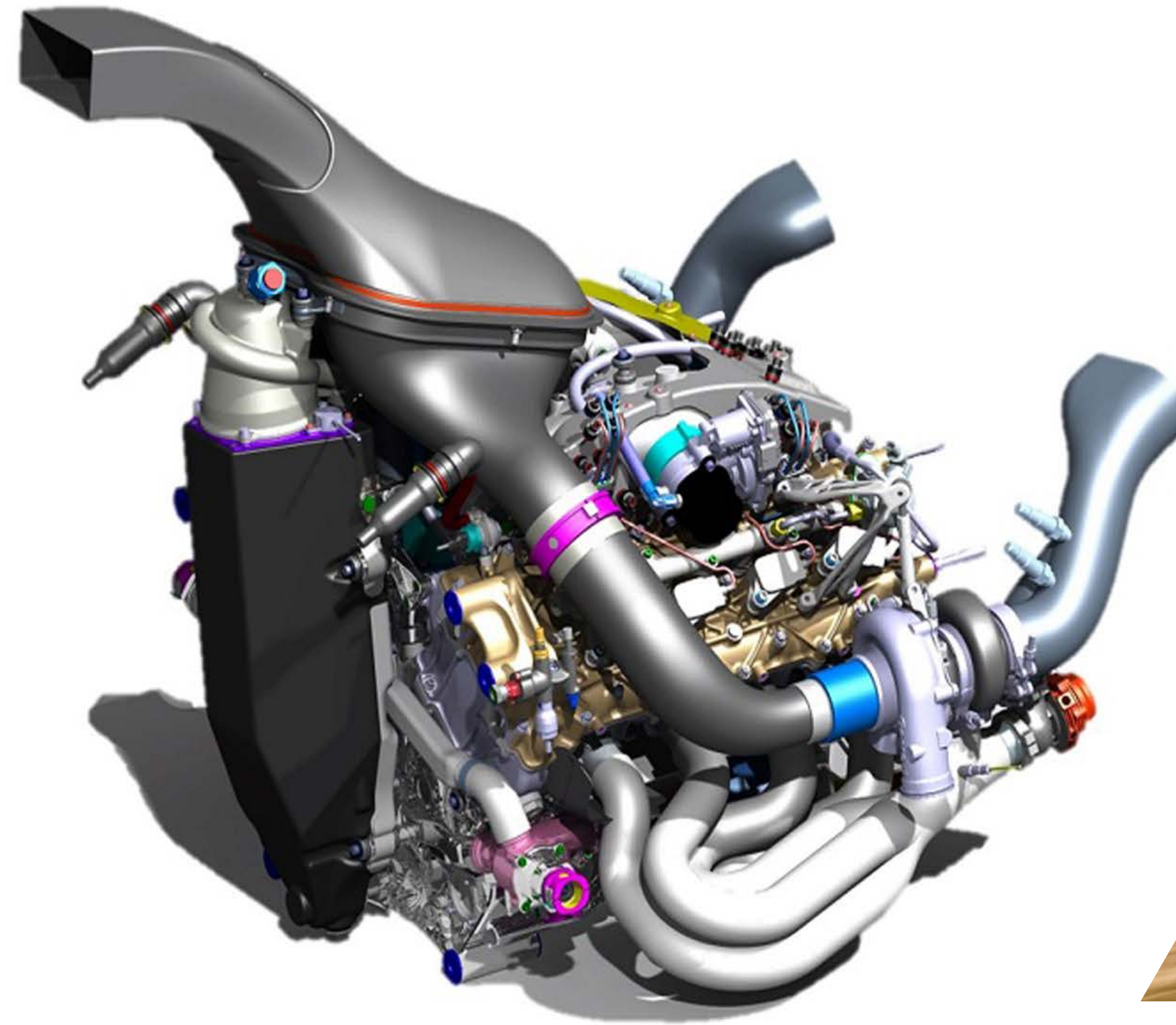
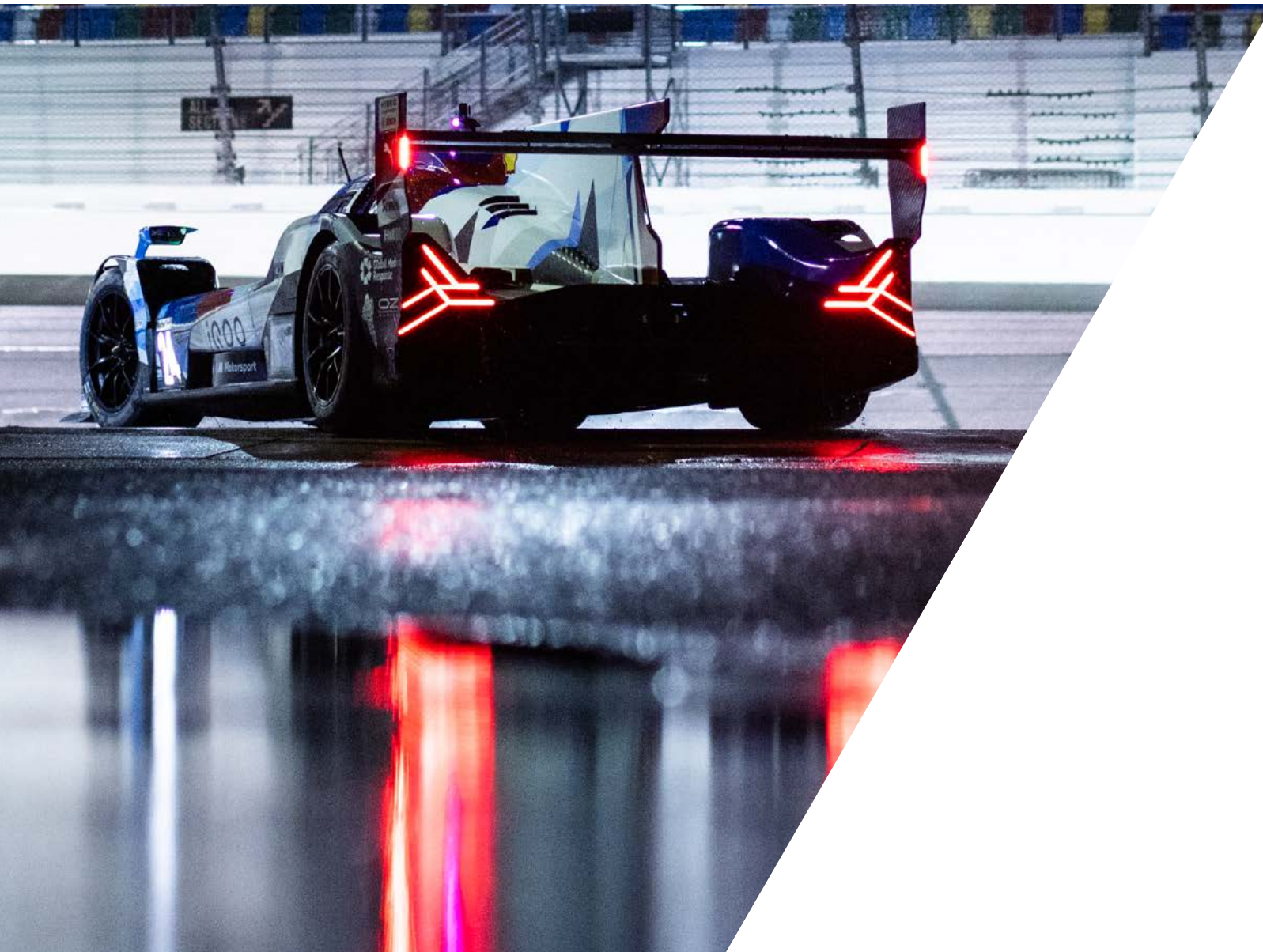
Dimensions

Length	4,991 mm
Width	1,994 mm
Height	Approx. 1,200 mm
Minimum weight (without driver)	1,030 kg

Chassis	CFRP monocoque with integrated fuel cell and high voltage battery compartment; CFRP crash elements at the front and rear
Front/Rear axle	Double wishbone axle with pushrod and fully adjustable shock absorbers; 3 rd element front and rear for ride height control, torsional suspension springs at the front and coil springs at the rear axle
Brakes	Hydraulic dual-circuit braking system with brake by wire system for rear axle; monoblock light alloy brake callipers; internally ventilated carbon fibre brake disks front and rear
Wheels	Aluminium forged wheels; 18" x 12.5" front, 18" x 14" rear
Tyres	Michelin; front: 29/71-18, rear: 34/71-18

BMW M HYBRID V8.

THE P66/3 ENGINE.

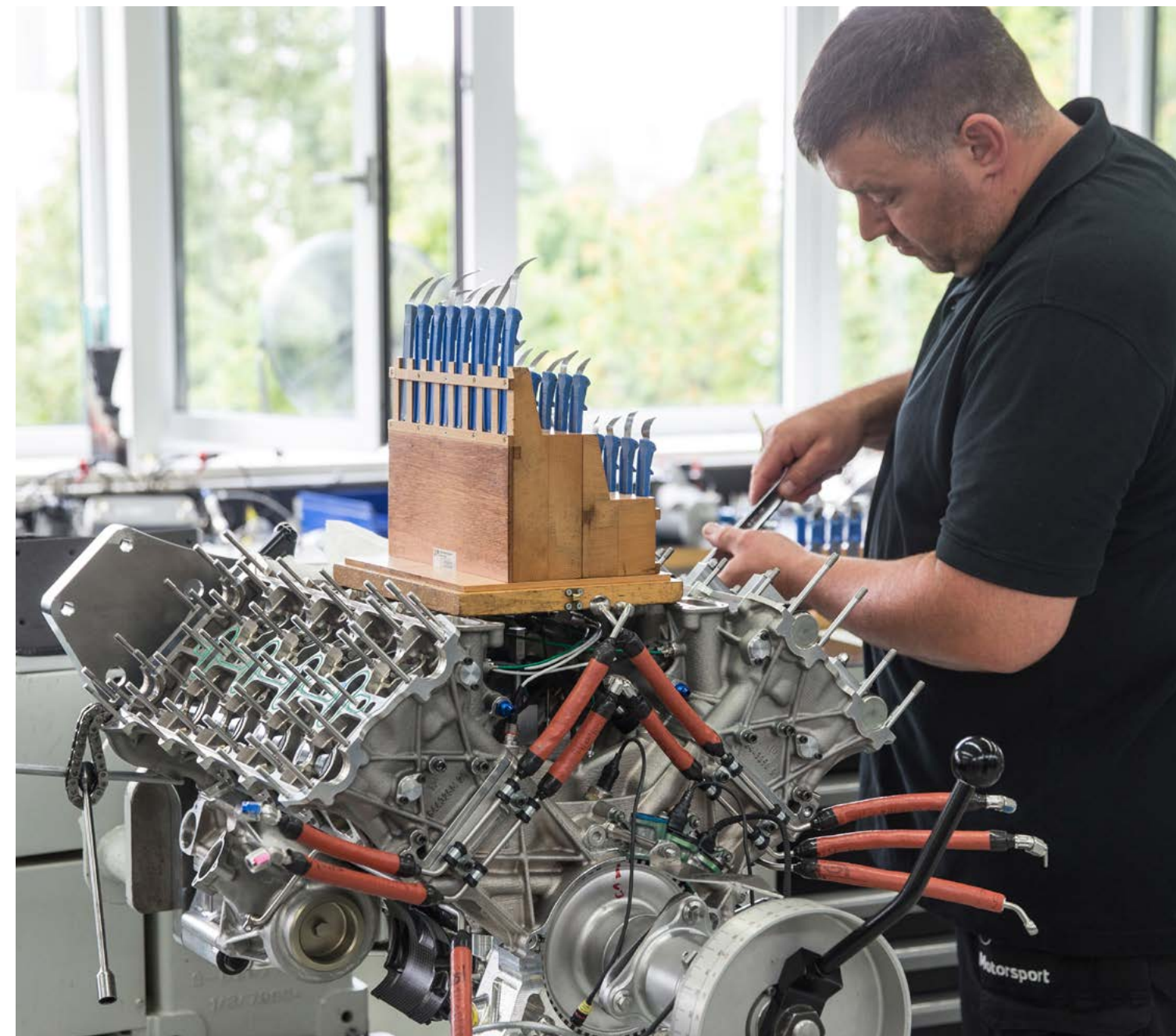


The BMW M Hybrid V8 is powered by the P66/3 eight-cylinder turbo engine with supplementary electric drive. The combustion engine is based on the DTM unit used in the BMW M4 DTM in 2017 and 2018. During two phases of reconstruction, it underwent comprehensive adjustments to meet the stringent requirements of the LMDh hybrid drive system. Ulrich Schulz, Head of Drivetrain Design at BMW M Motorsport, and his group had initiated an evaluation to determine which race engine would be best suited for conversion into a high-performance hybrid drive system, even before the

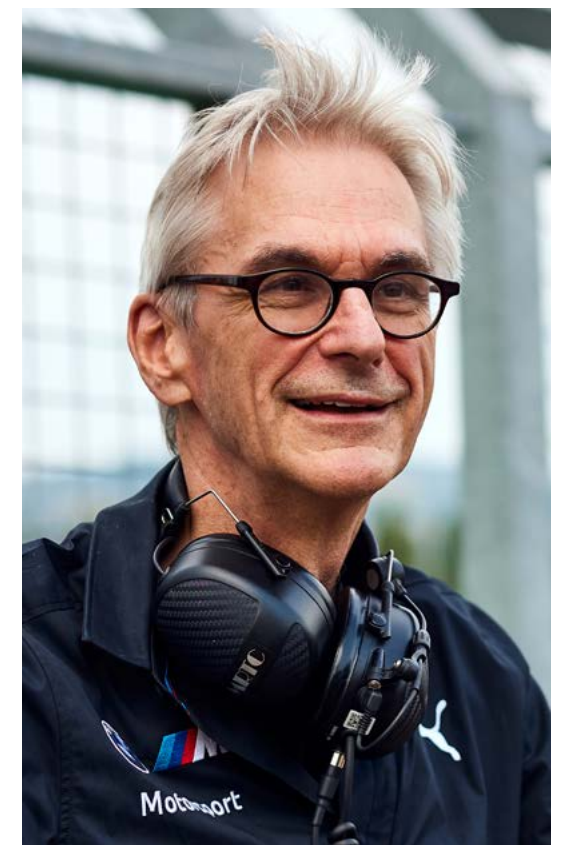
BMW Group Board of Management had given the green light to the BMW M Motorsport entry in the LMDh category in June 2021. Time constraints and the need to consider sustainability aspects that are playing an ever more critical role in motor racing, as well as the automobile industry in general, meant that returning to the drawing board to design a completely new engine and building it at great cost was not an option. Consequently, the question was to establish which proven race engine would best meet the stringent requirements and specifications of the LMDh regulations.

The normally-aspirated P66/1 eight-cylinder engine used in the 2017 and 2018 seasons in the BMW M4 DTM was the one that got the nod. As a fully load-bearing component in the BMW M Hybrid V8, it had the advantage that it could be used in a monocoque chassis without an additional subframe and it was also the one that most closely corresponded to the regulatory requirements after conversion to a hybrid turbo engine. The first phase saw the normally-aspirated P66/1 DTM engine converted into an intermediate engine, named P66/2, primarily by adapting two turbochargers and adjusting the crank drive. The focus was on durability, increased performance and temperature management for the engine.

The P66/2 completed numerous testing units, including complete racetrack simulations, on the test bench. The next step was the creation of the P66/3 race engine, including a twin-turbo version, adjustments to the specific requirements of the Dallara chassis, final exhaust system, oil tank, cabling and integration of the high-voltage environment. The cylinder block and cylinder heads were recast in the BMW Group foundry in Landshut and the injection system was rebuilt for direct injection. Engineers who already boasted plenty of experience with electric drive systems from the Formula E project were testing and integrating the electric motor in parallel. The unit that forms the hybrid drive system in the car consists of the e-motor, the inverter and the high-voltage battery. There is a separator clutch between the electric and combustion engines, enabling fully-electric driving – in the pit lane, for example. The two drive components were connected in the car for the first time at the end of June 2022.



“During the evaluation phase, we also took a look at the P48 four-cylinder turbo engine from the BMW M4 DTM and the P63 eight-cylinder turbo engine from the BMW M8 GTE, but potential problems with the durability of the P48 and the heavy weight of the P63 were negative considerations. It is a huge plus that we were able to make use of existing materials such as steel and aluminium from BMW’s time in Formula 1 for the basis of the engine, as well as for individual components – like shafts, housing and small parts. That saved us time and a lot of money and was therefore efficient and sustainable. Efficiency was a critical factor for this project, as we had a very short period of time available between getting started and the first racing appearance. Converting the normally-aspirated P66/1 engine into a bi-turbo and then working with the electric drivetrain colleagues to turn it into a hybrid drive system was very complex. Thanks to the expertise, the great collaboration and the high level of motivation of all departments, we managed to complete the fire-up of the complete drive unit just a few weeks before the roll-out of the car.”



Ulrich Schulz,
Head of Drivetrain Design
at BMW M Motorsport

BMW M HYBRID V8.

ENGINE SPECIFICATIONS.



Name	V-shaped Otto four-stroke twin-turbo engine
Capacity	3,999 cc
No. cylinders	8
Cylinder construction	Cast aluminium cylinder block and cylinder head, cylinder lining as iron layer in LDS procedure
V angle	90 °
Bore	93 mm
Stroke	73.6 mm
Cylinder spacing	102 mm
Valves per cylinder	4
Engine speed	max. 8,200 rpm
Output (regulated)	approx. 640 hp
Torque	approx. 650 Nm
Injection	High-pressure direct injection at 350 bar
Oil system	Dry sump system with six-cell oil drain pump and oil tank

BMW M HYBRID V8.

FACTS AND FIGURES.

- The BMW M Hybrid V8 without engine consists of approximately 1,900 single parts.
- The P66/3 engine consists of a total of 4,306 parts, 1,006 of them are different parts
- BMW M Motorsport completed 12 test events and 28 days of running the car in 20 weeks
- More than 25 BMW M Motorsport people have been directly involved in testing
- In total, approximately 60 people are permanently involved in testing and racing the BMW M Hybrid V8 in 2023.



LMDH COMMON PARTS FOR ALL MANUFACTURERS:

- Hybrid system (electric engine, high voltage battery, DC-DC, looms)
- Gearbox
- Scrutineering system

BMW DEVELOPMENT:

- Combustion engine
- Software / functions
- Overall vehicle performance (Driver in the loop simulator)
- Rims
- Exterior design (BMW Group Designworks in the lead)
- Signature lighting front and rear

DALLARA DEVELOPMENT (by LMDh regulations):

- Survival cell
- Steering
- Suspension
- Fuel cell
- Cockpit (seat, pedals, ergonomics)

JOINT DEVELOPMENT BMW/DALLARA:

- Bodywork design and aerodynamics
- Combustion engine integration (bellhousing, engine studs and struts)
- Cooling system
- Brake friction assembly
- Overall electric and electronic layout

BMW M HYBRID V8.

DESIGN.



[BMW M Design]

The most critical task and the greatest challenge for the design team in the LMDh programme design team was that the prototype must be clearly recognisable as a BMW M Motorsport car. BMW Group Designworks and chassis manufacturer Dallara accepted this challenge and created a prototype that

shows many typical BMW M design elements. The hallmark of the design for the BMW M Hybrid V8 is the wide kidney. In addition, it boasts elements like the nested BMW logo on the hood, twin BMW icon lights, dynamic body side, Hofmeister kink window graphic, M 'hook' mirrors and the tail-lights.

BMW M HYBRID V8.

CAMOUFLAGE LIVERY WITH HERITAGE ELEMENTS.



Watch Mbedded video.

For testing, BMW Group Designworks created a camouflage livery with many elements from five decades of motor racing history in North America. The images of iconic racecars – the 1976 BMW 3.0 CSL, the 1981 BMW M1/C, the 1978 BMW 320i Turbo, the 1986 BMW GTP, the BMW M3 E36 GTS-2, the BMW Z4 GTLM and the BMW M8 GTE – create a graphic mosaic which obscures the shape of the BMW M Hybrid V8 to maintain competitive IP during development testing.

"My team's job was to make the BMW M Hybrid V8 look like a BMW, and embrace every opportunity to make it also perform like one on the race track. The design is rooted in BMW's DNA of purposeful, efficient performance, and the exterior's bold, determined character invokes BMW's frontiersmanship of turbo power, now united with an optimised hybrid electric powertrain. The camouflage livery celebrates the 50 Years of M by commemorating the great cars of BMW's storied history in IMSA racing while uniquely cloaking the BMW M Hybrid V8's future-facing exterior geometry and technologies during the critical on-track development phase of the project. If you look closely you'll discover multiple winners of the Daytona 24 Hours, as well as the very first purpose-built IMSA GTP car from 1981, the BMW M1/C. We'll follow-up this camouflage with a works livery that exemplifies the dynamism and excitement of hybrid electric-powered competition."



Michael Scully,
BMW Group Designworks
Global Automotive Director

BMW M HYBRID V8.

WORKS LIVERY IN ICONIC BMW M MOTORSPORT COLOURS.

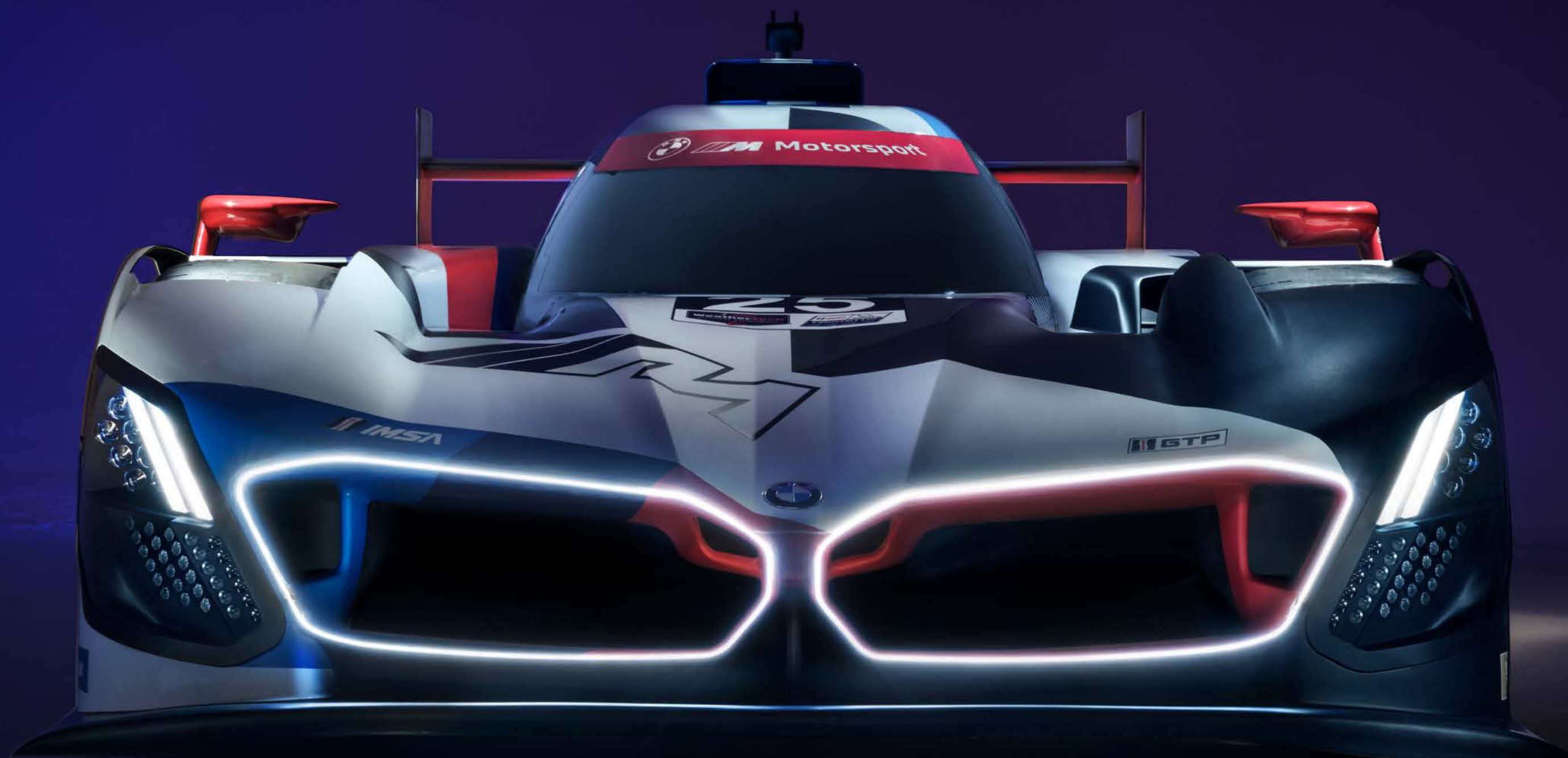


In September 2022, BMW M Motorsport presented the BMW M Hybrid V8 works livery in iconic BMW M colours. This is how the cars are racing in the 2023 IMSA season. The works livery represents a significant departure from the heritage-based 'Icons of IMSA' camouflage with a future-facing coat of arms comprised of modern, bold, fractal blocks of the iconic M colours and the M logo. "These elements have been deconstructed to form what at first might appear to be an abstract triangular pattern across the BMW M Hybrid V8, but when viewed from the side, the M logo clicks right into place – M reconstructed, if you will," Scully explained.

The design also features embedded references to the BMW logo, and utilises both blue and purple elements to pronounce the natural colours of electricity. Additionally the works livery carries BMW M Motorsport's now-signature matte black extension ahead of the cockpit beneath the driver's side of the windscreen, thereby extending BMW's interior design hallmark of driver orientation to the exterior of the car for enhanced driver focus. In fact on the race-ready cars this non-reflective matte element will be the only black foil on the car, as all other black areas shown at the launch will remain in their natural carbon fibre finish. "This measure allows us to reduce weight by 25 to 30 percent compared to a conventional livery for race cars. Less is more," said Scully.

BMW M HYBRID V8.

LASER-LIT KIDNEYS WITH EXCITING NEW TECHNOLOGY.



The layout of the laser-lit kidneys coincides with the open, flow-through architecture of a modern prototype race car, and the air which passes beneath and through them is fundamental to the aerodynamic performance of the car, both in terms of cooling, but also for efficiency of downforce. The front of the car invokes the faceted hood, nested BMW logo, and inverted 'Y' configuration between the kidneys of the BMW M Vision Next, and is a great example of BMW's showcars informing not only the production cars, but also the race cars. These elements, flanked by signature twin headlights on each side, make the front of the car unmistakably a BMW.

The kidneys' lighting uses an exciting new technology. Innovative Swiss company L.E.S.S. SA has developed a new approach as an alternative to LED lighting where light is generated by a nano-active optical fibre triggered by a laser. This provides ultra-bright and ultra-uniform light within a very small form factor such that it considerably saves weight and energy when embedded onto a car. This technology was also presented as a future vision for the first time in the BMW M Vision Next in 2019.

Transitioning around the side of the car, other BMW icons become apparent: the forward-leaning shark nose, the boomerang-shaped guide vane just behind the front wheel arch that summons the BMW M4's air breather feature, the M mirrors and a modern interpretation of the Hofmeister kink. The sidepod carries a defined diagonal feature line which punctuates the radiused surface above it and at the same time also helps define the requisite front diffuser airflow exit. "A great example of the interdependence between BMW design DNA and dedicated efficiency which makes racing projects like this so engaging," said Scully.

BMW M HYBRID V8.

KEY PERSONNEL.



Andreas Roos,
Head of BMW M Motorsport



Maurizio Leschiutta,
Project Leader LMDh at BMW M Motorsport



Valentino Conti,
Head of Operations LMDh at BMW M Motorsport



Bobby Rahal,
Team Principal BMW M Team RLL



Brandon Fry,
Technical Director BMW M Team RLL



Steve Eriksen,
Chief Operating Officer BMW M Team RLL

IMSA DRIVERS.

#24 BMW M HYBRID V8.



PHILIPP ENG

Date of birth: 28th February 1990

Place of birth: Salzburg (AUT)

BMW M works driver since: 2016

Major successes:

Victory at 24h Daytona 2019,
victory at 24h Spa-Francorchamps 2016 & 2018



AUGUSTO FARFUS

Date of birth: 3rd September 1983

Place of birth: Curitiba (BRA)

BMW M works driver since: 2007

Major successes:

Victory at 24h Daytona 2019 & 2020,
Intercontinental GT Champion 2020,
victory at FIA GT World Cup Macau 2018,
victory at 24h Nürburgring 2010

IMSA DRIVERS.

#25 BMW M HYBRID V8.



CONNOR DE PHILLIPPI

Date of birth: 25th December 1992

Place of birth: San Clemente (USA)

BMW M works driver since: 2018

Major successes:

Victory at 24h Daytona 2019,
victory at 24h Nürburgring 2017,
ADAC GT Masters Champion 2016



NICK YELLOLY

Date of birth: 3rd December 1990

Place of birth: Stafford (GBR)

BMW M works driver since: 2019

Major successes:

Victory at 24h Nürburgring 2020,
2nd place at 8h Indianapolis 2020

IMSA DRIVERS.

ENDURANCE DRIVERS.



COLTON HERTA

Date of birth: 30th March 2000

Place of birth: Valencia (USA)

BMW M works driver since: 2023

Major successes:

Victory at 24h Daytona 2019 (BMW M8 GTE) & 2022 (LMP2),
3rd place IndyCar Series 2020



SHELDON VAN DER LINDE

Date of birth: 13th May 1999

Place of birth: Johannesburg (RSA)

BMW M works driver since: 2019

Major successes:

DTM champion 2022,
Victory at 9h Kyalami 2020,
3rd place at 24h Nürburgring 2020,
2nd place at 24h Nürburgring 2021



MARCO WITTMANN

Date of birth: 24th November 1989

Place of birth: Fürth (GER)

BMW M works driver since: 2012

Major successes:

DTM champion 2014 & 2016,
2nd place at 24h Nürburgring 2021,
3rd place at 24h Daytona 2021

IMSA DRIVERS.

RESERVE DRIVER.



DRIES VANTHOOR

Date of birth: 20th April 1998

Place of birth: Hasselt (BEL)

BMW M works driver since: 2023

Major successes:

Victory at 24h Dubai 2022 & 2023, Victory at 24h Nürburgring 2019 & 2022, GTWC Europe Sprint Cup champion 2020, 2021 & 2022, GTWC Europe overall champion 2021, Victory at Bathurst 12H 2018, class win at 24h Le Mans 2017



BMW M HYBRID V8.

IMSA GTP CLASS.

GTP stands for Grand Touring Prototype. The newest and most technologically advanced Prototype race car takes to the track for the first time in 2023, featuring a common hybrid powertrain for all entries that takes kinetic energy gained in braking and stores it in batteries for later use when needed. Four global automotive manufacturers – BMW, Acura, Cadillac and Porsche – are entered in the class. Each manufacturer developed its own unique internal combustion engine and bodywork styling to take on this cutting-edge challenge. The GTP name harks back to a previous 'golden era' of IMSA prototype competition. From 1981 to 1993, IMSA GTP featured innovative prototypes from a variety of manufacturers. The original GTP era helped to develop what then were emerging technologies such as antilock braking (ABS) and traction control among others, while also placing an emphasis on limiting fuel consumption. BMW M Motorsport ran the BMW GTP prototype with more than 1,000 hp in 1986 and won the race in Watkins Glen.



2023 IMSA GTP RACE CALENDAR.

28 th /29 th January	Daytona (USA)
18 th March	Sebring (USA)
15 th April	Long Beach (USA)
14 th May	Laguna Seca (USA)
25 th June	Watkins Glen (USA)
9 th July	Continental Tire Motorsport Park (CAN)
6 th August	Road America (USA)
17 th September	Indianapolis (USA)
14 th October	Road Atlanta (USA)

BMW M HYBRID V8.

COLLABORATION WITH IRACING.



Maurizio Leschiutta,
LMDh project leader
at BMW M Motorsport

"When it comes to introducing real BMW M race cars to the virtual world, BMW M Motorsport and iRacing have been close and perfectly attuned partners for many years. As the head of such an important project, confidentiality is my number one priority; it would be fatal if the competition discovered the technical details of our car that we want to keep secret. In that respect, I came away really impressed by iRacing's professionalism. We are making CAD data and findings from our simulator and racetrack tests available to iRacing. They are used as the basis on which to create a realistic virtual version. This gives every sim racer the opportunity to experience the performance of a state-of-the-art prototype and the appeal of BMW M Motorsport."

"We're incredibly excited to confirm that the BMW M Hybrid V8 will be coming to iRacing in the coming months. We've been eagerly anticipating the LMDh class for a few years now, and BMW M Motorsport's support has been indispensable in helping us to bring both their entry and the new class to iRacing. Building this car in the sim has been a joy for our team, and we can't wait to see the community's response upon release."



Steve Myers,
Executive Vice President
at iRacing

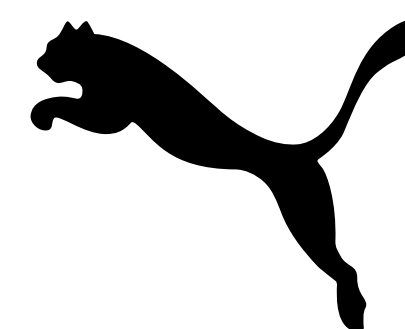
The successful collaboration between BMW M Motorsport and the leading simulation platform iRacing enters the next round. BMW M Motorsport is the first manufacturer in the world to make its new LMDh car, the BMW M Hybrid V8, available to the sim racing community.

Even before the first race of the real car at Daytona, sim racers from all over the world already competed in big race events on iRacing with the BMW M Hybrid V8. As with the BMW M4 GT3, the BMW M8 GTE or the BMW M4 GT4, real and virtual development of the car ran synchronously.



BMW M HYBRID V8.

BMW M MOTORSPORT PARTNERS.



BMW M HYBRID V8.

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