# FAST & FURIOUS™

102

Build the Legendary

## DODGE CHARGER R/T



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**DODGE CHARGER R/T**



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# HAVANA AND THE CUBAN MILE

**To open *The Fate of the Furious*, a spectacular car race through the streets of Havana was suggested. Achieving it was no easy task, since it would be the first Hollywood production to be filmed in Cuba since the embargo imposed by the United States in 1963.**

Filming *of The Fate of the Furious* got underway in the spring of 2016. To remind everyone of the roots of the franchise, the movie's producers wanted to hark back to the tradition of street racing. This time, however, in an incomparable setting: the city of Havana, the scene of what would come to be known as the Cuban Mile.

"Every *Fast & Furious* fan knows what a quarter-mile race is," says director F. Gary Gray. "We wanted to introduce something new and we invented this race called the Cuban Mile, very dangerous, with lots of bends, and in the middle of the traffic. The race crosses Havana and it's really crazy. We thought it would be a good way to start this movie."

**↑ The eighth movie in the *Fast & Furious* saga made history by getting permission to film the initial race scene on the main streets of Havana, Cuba.**



The producers liked the idea of starting the movie in Cuba, where car culture is part of the social fabric of the nation. Screenwriter Chris Morgan was also convinced, since he sensed that a character like Toretto would feel an immediate connection with the Cubans.

"Cuba is known for its automobile culture, and if anyone can immerse himself in that culture, it's Dom Toretto. He knows everything about old cars and understands what it means to keep them in good condition. Cuban ingenuity has made it possible to maintain these cars in working order with parts taken from a lawnmower, a boat or a tractor. It's the authentic spirit of tuning that Dom understands so well."

## THE FRANCHISE BREAKS DOWN BARRIERS

The challenge of taking a Hollywood production to the streets of Havana after such a long blockade between both countries stood out as the biggest difficulty. Producer Michael Fottrell explained the idea to the international political consultant, Richard Klein, who had already made it possible for *Furious 7* to be filmed in Abu Dhabi. After numerous conversations and meetings with Cuban and American politicians, the obstacles began to be overcome. Of course, Fottrell had to undertake to meet a long list of legal requirements imposed by the State Department for the purpose of obtaining the permits and authorisations to move actors, technicians, equipment and cars to Cuba.

As it was unknown territory for modern American cinema, the producer and his team made some forays with the objective of identifying possible locations and contacting local artists and technicians who might be interested in taking part.

"We weren't very sure if *Fast & Furious* would be well known in Cuba," recalls Richard Klein, "but luckily its reputation had gone before us, since the franchise is famous and very popular with young people. Themes like loyalty, friendship and cars are universal."

## CLASSIC CARS

As soon as the first members of the crew began disembarking in Havana, they were given a very cordial warm welcome by the Cuban people. The new arrivals were also amazed by the magnificent classic cars that can still be seen on the streets of the city, flanked by beautiful colonial-style buildings, or in front of the famous Hotel Nacional and the no less famous *malecón* (esplanade), running between Old Havana and Vedado. Possibly, the man most struck was the franchise's vehicle coordinator Dennis McCarthy. He insisted on meeting with David Peña, a popular Cuban mechanic who goes by the nickname of "McQueen" on the racetracks. His help was of inestimable value for locating magnificent-looking cars all over the island that gave the film's opening scene a unique atmosphere.

"I thought Havana was a wonderful city," says McCarthy. "Strolling around the streets you feel like you've traveled back in time. Seventy percent of the vehicles you see on the roads are from the 1950s, and even the 1940s. But the most impressive thing is how well they are looked after. The enthusiasm and the friendliness of the people was something that really moved me."

## MAKING HISTORY

The filming in Havana began just one month after the historic meeting between presidents Barack Obama and Raúl Castro. While onlookers crowded round to try to get a glimpse of the two main stars of the franchise, a combined team of American and Cuban actors brought a fabulous car party to life right in the centre of the city. In the days following, a helicopter piloted by the veteran Fred North joined the production to get multiple shots of the party and the race from the sky. That became a total sensation, as it was the first time an American helicopter had entered Cuban airspace.

"The first days of shooting were incredible," recalls Richard Klein, "the whole of Havana was at a standstill. The people were getting out of their cars, on the balconies, in the street, just to see the helicopter. They were magical moments, we knew we were making history."

## WITH CUBA IN THEIR HEARTS

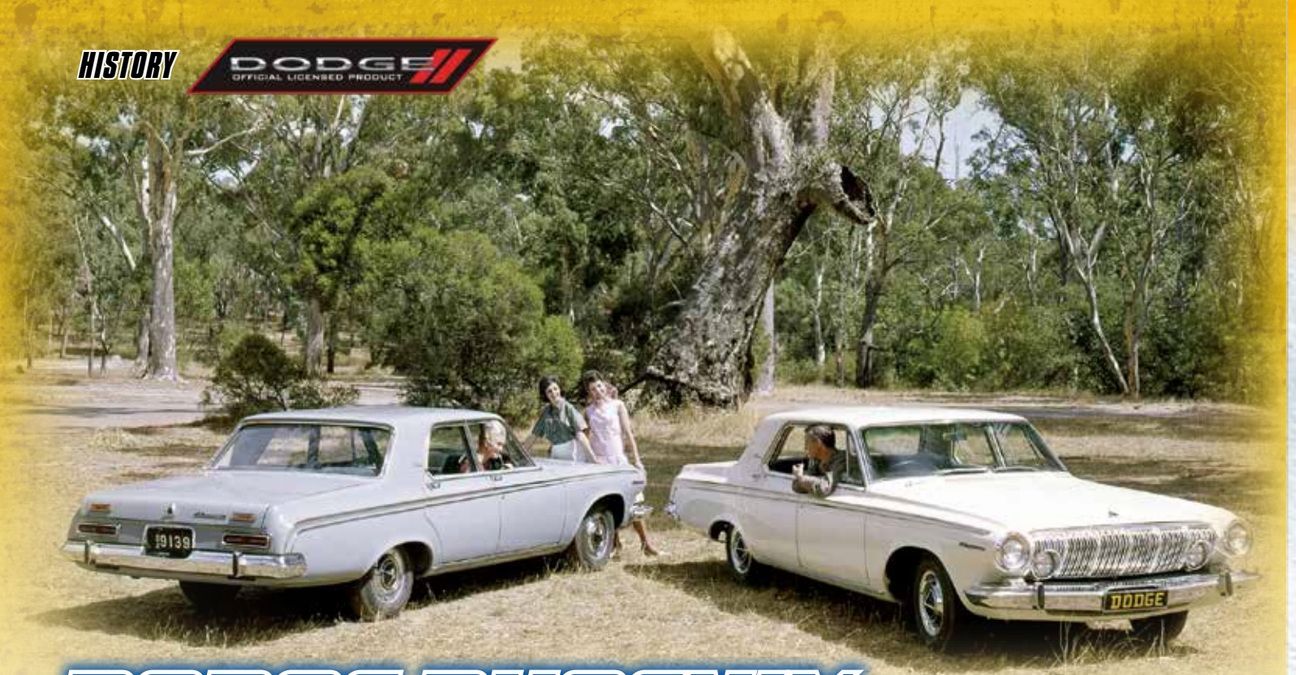
Apart from the people who were participating actively in the production, hundreds of fans and onlookers came every day to the place where they were working to enthusiastically applaud when the stars arrived, or when the most striking vehicles were loaded and unloaded. For several days, *Fast & Furious* was the main attraction in Havana. The people, natural and friendly, good-humouredly cheered the technicians and did not miss the chance to take a selfie next to a fast car or the acclaimed talent. The experience could not have been more beautiful.

"We wanted a brilliant first sequence for the movie," said F. Gary Gray, summing up what filming on the island was like, "but we also wanted to show that Cuba is an incredible country with amazing people. Much of Havana is unique in the world. The whole city is a work of art packed with culture and history. We want the people of the whole world to feel Cuba as we felt it."




## CELESTINO CORNIELLE

Born in San Francisco de Macoris, in the Dominican Republic, in 1981, he moved with his family to New York as a small boy. Years later, he settled in Miami, where he began his acting career together with Eva Longoria, in the video *Carlita's Secret* (2004). Early in his career, Celestino made an effort not to be pigeonholed and played a wide variety of parts in TV series like NCIS, *Dexter*, *CSI: Miami* and *The Mentalist*. After his role as officer Miguel Moreno in 12 episodes of *Days of Our Lives*, he had the chance to appear in *The Fate of the Furious*, playing the part of Raldo in the opening sequence, which was one of the most notable successes of his career. Since then, Celestino has appeared regularly on the small screen, continuing to demonstrate his talent in *Hawaii Five-0*, *Too Old to Die Young* and *Bosch*, among other series.



# DODGE PHOENIX

**Manufactured between 1960 and 1972, the Dodge Phoenix was an elegant four-door saloon car built by the Chrysler Corporation's Australian subsidiary. It took its name from the top-of-the-range version of the Dodge Dart on which it was based, and which was only manufactured with a single V8 engine in two versions, 5.2 and 6.3 litre.**

**Two units of the Dodge Phoenix, identical to American Dodge Darts in the same period. The only obvious difference is the steering wheel on the right-hand side.**

The Dodge Phoenix was launched in Australia in 1960, replacing the Dodge Custom Royal, a model imported from the USA that was assembled in Australia using the CKD method. This consisted in the importation of kits of entirely unassembled parts, which would then be assembled locally. Its successor, on the other hand, was manufactured completely in Australia and was almost identical to the contemporary American Dodge Dart.

With a 5.2-litre V8 engine, in the Australian subsidiary's range the Dodge Phoenix was placed above the Chrysler Royal, a model developed in the country, and as a result it was the Chrysler Corporation's most deluxe model on sale there. In 1961 and 1962 the Dodge Phoenix was given the same redesigns as the American Dodge Dart, but after 1963 it became the Australian version of the Dodge 440, and from 1965 onwards it adopted the bodywork of the Plymouth Fury III, although always with the same initial engine.

In 1967 another four-door bodywork was added to the range; it was hardtop (without the B pillar), and was fitted with a more powerful 6.3-litre V8 engine. On the outside it was identical to the Plymouth Fury, but it had the dashboard and the more luxurious seats of the American Dodge Polara.



**This 1966 Dodge Phoenix is identical to the Plymouth Fury that was on sale at the time in Canada.**







# THE REAR BUMPER AND NUMBER PLATE

**In this assembly session you will be working on the rear bumper and number plate. Please follow our instructions and the accompanying illustrations carefully.**

## PIECES FOR THIS STAGE

102A



102B




102C



102D



AP



102A Rear bumper
102B Rear number plate
102C Left overrider
102D Right overrider
AP Screws 1.7 × 4mm (× 9)*

* Some of the parts are spares.

**Editor's note:** The parts shown here may differ slightly from the parts supplied with this issue. This does not affect the quality or the assembly instructions in any way.

## ASSEMBLY AREA

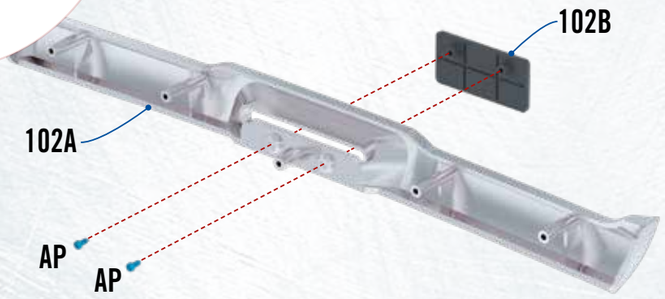


NUMBER PLATE

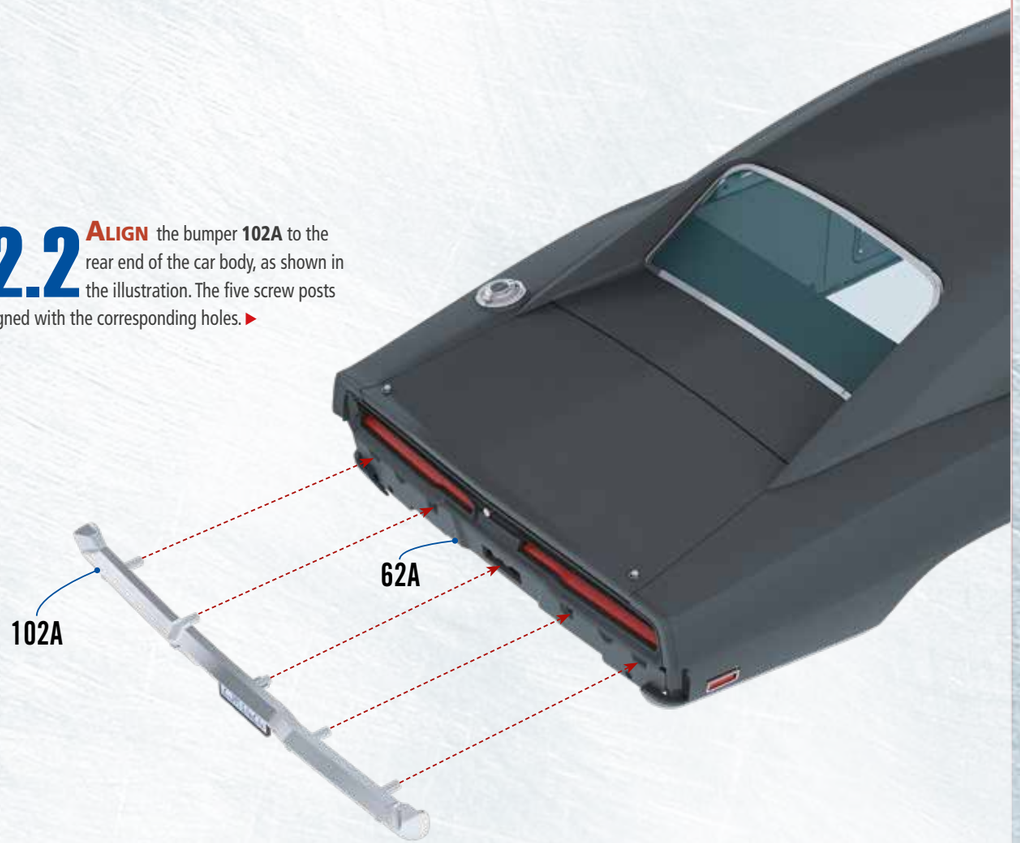
# The rear bumper and number plate



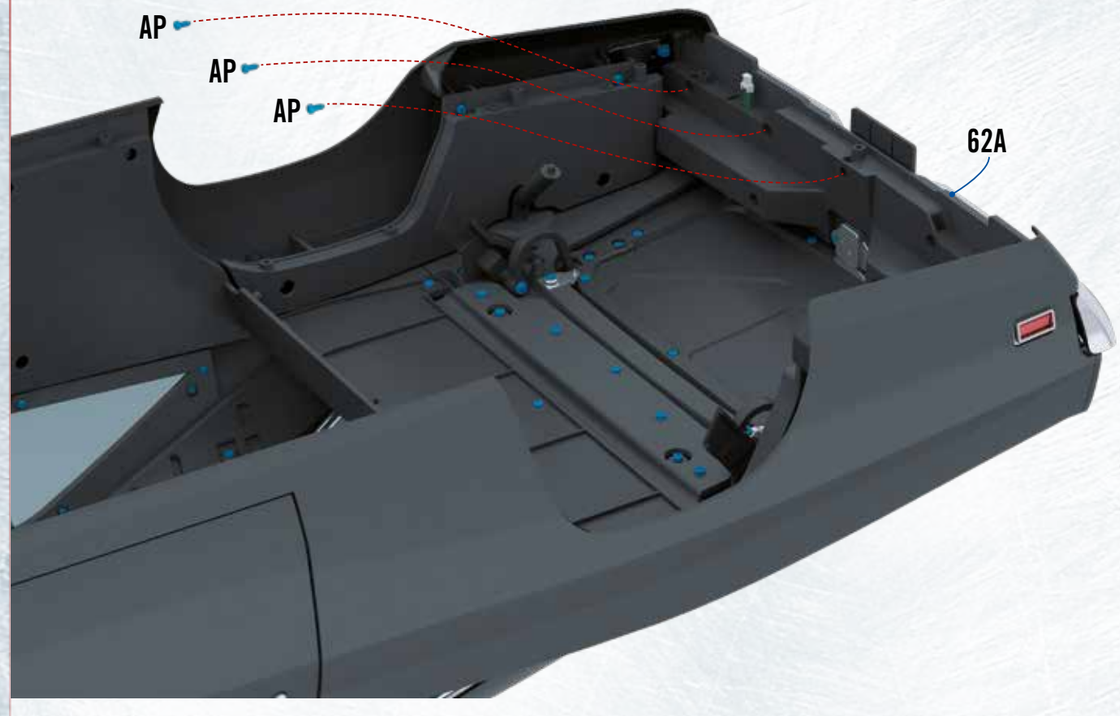

**102.1** **ALIGN** the two holed screw posts on the inside of the rear number plate **102B** with the two central holes in the rear bumper **102A**. From the inside of the bumper, insert two **AP** screws to secure the number plate. ▼




**102.2** **ALIGN** the bumper **102A** to the rear end of the car body, as shown in the illustration. The five screw posts must be aligned with the corresponding holes. ▶

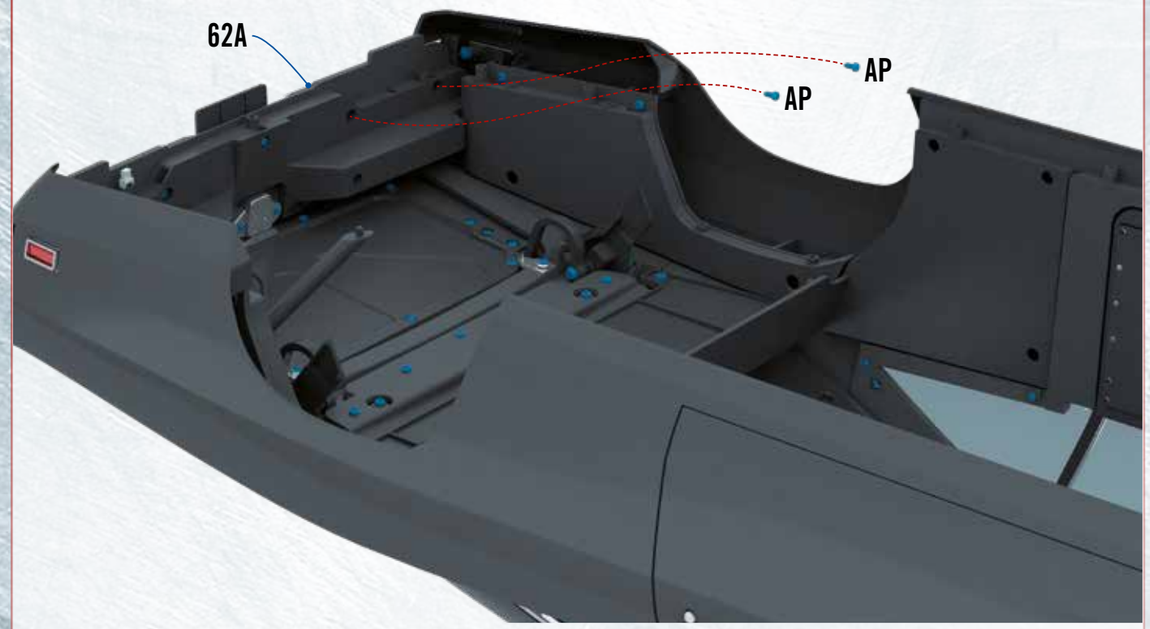



**102.3** **TURN** the car body over and insert three **AP** screws into the holes indicated in the illustration. ▼



## 102.4

**FINALLY,** secure the bumper with two **AP** screws, as shown in the illustration. ▼




### RESULTS OF STAGE 102

**You have now attached the rear bumper and number plate onto the body of your model car. Put everything you have done so far in a safe place.**







# WHEELS STUCK TO THE ROAD



**Horsepower is not all you need to go fast on the track - the aerodynamics of the car also play a fundamental role in getting a good lap time. In this edition, we will discover the secrets of racing car wings and splitters.**

When you start getting serious about performance on the track, several parameters come into play that cannot be ignored. After having boosted the engine power and fine-tuned the set-up, it is essential to take the aerodynamic load of the car into consideration. The aerodynamic load is the downward force that is exerted on a moving car by the flow of air over the bodywork. This "downforce" can dramatically increase the car's adherence to the road surface.

There are essentially three ways to modify it:

– Mount a rear wing that deflects the airflow upwards. The result is an equal and opposite force that pushes the car downwards. This force is proportional to the square of the speed of the car, as the speed affects both the quantity of air displaced and the speed of the displaced air.

– Exploit the ground effect by trying to channel a certain amount of air under the car (actually increasing its speed following the reduction of the flow area) and consequently generating a low-pressure area between the car and the road, known as the Venturi or "ground" effect.

– Design the car body to achieve a downforce effect.

In most cases, car designers try to achieve the maximum possible aerodynamic load, as the greater grip generated allows for faster cornering speeds and reduces braking distance. However, they have to be careful not to overdo it, because as the size and angle of the rear wing increases, so does the car's drag, and its speed in a straight line decreases.

Historically, racing cars began to use wings in the 1960s. It was only in the late 1970s that the ground effect began to be exploited with the introduction of aerodynamic elements such as side skirts, splitters and diffusers. Today, open-wheeled cars (such as Formula 1 single-seaters) have one front and one rear wing, while those with covered wheels generally have only the rear wing.

If the car is heavy, has a front-mounted engine and has a certain tendency to understeer, it will be necessary to reduce the weight as much as possible, upgrade the suspension and widen the track. A splitter will also help to reduce understeer.

**HOW IS A WING MADE?**

In principle, a wing consists of three distinct elements: the aerofoils, the side panels and the supports. The aerofoils are the surfaces that have the task of generating a downward thrust: their operation is exactly the opposite of those present on aeroplanes, with the thrust being directed towards the ground instead of upwards. The airflow consequently generates downforce, increasing proportionally with the air volume that hits the wing. This increases the pressure of the wheels against the ground, and ensures that there is no loss of contact between the tyres and the road surface.

Standard cars usually have a single wing profile, known as monoplanar. On the contrary, in motor racing, where the aerodynamic load plays a fundamental role in allowing the cars to tackle curves at high speed, devices with two or three aerofoils (called biplanar and triplanar) are often used. In Formula 1 in the past, before restrictions were introduced, it was common to see cars with 9 or 10 aerofoils on the rear wing! In the case of the front wing, however, the task of wing aerofoils is to help the steering of the vehicle and optimise the airflow over the body of the car. Attention is paid to the performance of the cooling system and the effects on the aerodynamic load generated by the car body itself.

The second element that makes up a wing are the upright panels, two elements positioned on the sides of the wing profile, usually perpendicular to the ground. They have the function of reducing the extremity vortices and consequently any induced resistance, as well as directing the airflow to the most efficient point for the car's aerodynamics. Sometimes it is possible to find wings with secondary upright panels within the profile itself, to optimise the internal fluid dynamics of the aerofoil assembly.

Finally, the supports have the task of keeping the wing fixed securely to the bodywork. They must be able to support the entire downward thrust generated by the aerofoils and at the same time transmit that energy to the vehicle, so they must be strong enough to withstand very high stresses. On racing cars, we are talking about aerodynamic loads that can easily exceed a ton!

**WHAT ARE SPLITTERS?**

Front splitters are essential aerodynamic components and are very important for balancing the front versus rear aerodynamic load distribution. Splitters are positioned immediately below the front bumper, parallel to the ground. They are light and are usually made of carbon fibre. Often, they are supported by adjustable rods that have the task of keeping them parallel to the ground even when external forces are exerted.

Front-end splitters on a racing car produce aerodynamic downforce by creating a difference in the air pressure on the upper and lower side of the splitter when the car moves forward.

**FRONT SPLITTERS**

To understand how a splitter creates downforce, you have to know a little about fluid dynamics. When a car travels at high speeds, the air pressure in front of the car can become very high. The incoming air approaches the car at V1, which is the speed of the air around the vehicle, and a pressure of P1, which is related to V1 according to Bernoulli's equation. P1 will be somewhat less than atmospheric pressure. The essential point to be taken from Bernoulli's equation is that the pressure inside an air stream is related to the velocity at which the air stream is moving.

All this air ends up going both above the car (over the bonnet) and below the car (under the front bumper). When too much of this air gets under the front bumper, the under-car air pressure builds up. This increased air pressure contributes to lift, which causes the front end of the car to lighten, reducing the amount of traction of the front wheels. Ideally, we want lower pressure, faster-moving air below the car, and higher-pressure, slower-moving air above the car.

As the air stream velocity increases, the dynamic pressure within the air goes down. In simple terms - the air travels faster in the low-pressure area created under the splitter, and that "sucks" the car's nose down, creating downforce and reducing understeer, especially on a track where you have fast-flowing corners. The splitter itself does not actually create downforce. What the splitter does is to increase the area over which high pressure can build up. The more high pressure there is above the splitter, and the more low pressure there is below the splitter, the greater the net downforce created.

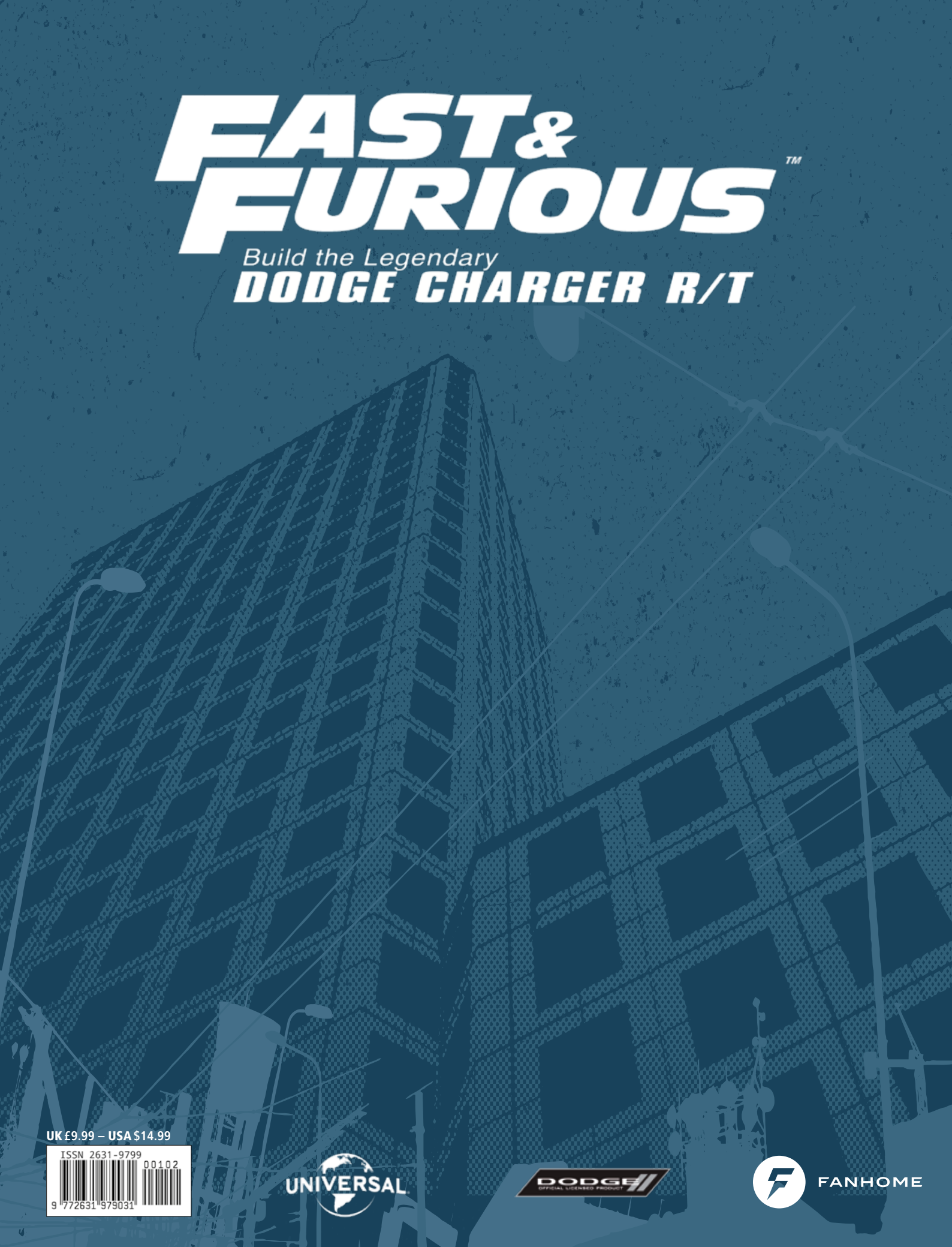
Additionally, if there are openings in the front bumper (above the splitter or lip) for brake ducts or radiator cooling, this increased air pressure will encourage more air to flow into these openings. The lower the car is to the ground, the greater suction that will be created by the ground effect; therefore, the splitter is usually located at the lowest possible point.

**On sports cars, a diffuser is often installed in the rear bumper. Its function is to slow down the faster air coming out from under the car and thus reduce the turbulence that would occur when it meets the slower external air.**



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