FAST & FURIOUS™

91

Build the Legendary DODGE CHARGER R/T



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FAST & FURIOUS

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KIET, AN AMAZING FIGHTER

In the *Fast & Furious* franchise, our heroes also have to confront many villains, along with their sidekicks, many of which became a real headache for Toretto and his team. This is the case, for example, with the powerful, athletic Kiet in *Furious 7*.

In *Furious 7*, Dominic Toretto initially believes that the main danger to them is the vengeful Deckard Shaw. When he and his team agree to carry out a mission to recover the valuable tracking device known as the God's Eye, he will discover that he is going to have another rival to take into consideration: the mercenary Mose Jakande. And, once they try to rescue Ramsey and gain access to the device, they will come up against yet another human barrier, Jakande's lethal henchman Kiet.

A MARTIAL ARTS STAR

To play this character, the makers of the franchise immediately thought of Tony Jaa, an elephant herder

During the assault on the convoy that was carrying the kidnapped Ramsey, Brian ran into an unexpected adversary - Kiet, a martial arts expert who would make things difficult for him.

TONY JAA

In no time at all, Tony Jaa has become a really big name in action movies, and one of the greatest martial arts specialists currently active. Born in the province of Surin, in Thailand, on February 5, 1976, named Jaa Phanom Yeerum he continued the family's elephant herding tradition. As soon as he had the chance, though, he would escape to a movie theatre to see the films of his great idols, Bruce Lee, Jackie Chan and Jet Li. With the aim of emulating them, he began practicing martial arts. His outstanding skills allowed him to begin working in the cinema as an action stuntman. One of his screen tests came to the notice of the director Prachya Pinkaew, who did not hesitate to give him the leading role in the action movie *Ong Bak* (2003), which became an unexpected international hit, and had two sequels. Thanks to these movies, Jaa had the chance to appear in the seventh movie in the *Fast & Furious* franchise. Since then he has continued to demonstrate his charisma, fighting in entertaining movies like *xXx: Return of Xander Cage* (2017), *Paradox* (2017) and *Triple Threat* (2019).

who was beginning to make a name for himself in Asian cinema thanks to his martial arts skills. The actor was delighted with the proposal to join the great *Fast & Furious* family, as it gave him the possibility of making his debut in Hollywood.

"I've been a great admirer of the franchise right from the very start," says Jaa. "The movies are fast, enjoyable and they keep the audience involved. There's a magnificent combination of humour and action, something I really appreciate in an action movie. I couldn't have found a better movie with which to start working for a major studio in the United States."

The film's cast and crew were equally excited by the chance to see the great feats of this expert in disciplines like Muay Thai and Taekwondo, capable of performing the most surprising acrobatic moves, in the flesh. They all enjoyed his infectious energy on set and his affable and modest manner.

"Tony Jaa is the most amazing athlete I've ever seen in my life," admits producer Neal H. Moritz. "Every run, every jump, every somersault, he did them so easily."

The actor's presence breathed new life into the action scenes, as he performed them with electrifying dynamism. "My character is strong and professional," Tony Jaa proudly explained. "Pure action. I did everything I could to make an impact in the movie."

ACTION MOVIE PROFESSIONALS

In *Furious 7*, the director James Wan and his crew faced the challenge of designing and shooting multiple action scenes in which the majority of the regular cast was involved, as well as the new members. For this they wanted to have the help of two experienced professionals, stunt coordinator Joel Kramer and fight choreographer Jeff Imada. The director met with them to get new inspiration with a view to filming the rapid movements from every angle.

"My objective consisted in filming the action in the fights in such a way that we could let the actors get on with it, without the need to make too many cuts, and just let my camera stay with them," James Wan explains. "Besides, I'm a great fan of fireworks in my camerawork, so I also wanted to bring something of the aesthetic that I have used in long action sequences before, and fuse the styles."

With a collective working method, the crew strove to show that it was really the actors who were performing these scenes. Apart from taking care of the execution of multiple fight disciplines, Imada took the opportunity to use all the props and features of the sets to heighten the action, a task in which he could count on Kramer's involvement.

"James Wan gave us a view of how he imagined the stunts in the sequences, but he always left us room to do them our way," says the stunt coordinator. "Personally, I don't like adding a whole load of pointless adornments if they are not going to serve the characters or the story. And this is where James Wan stands out; he is brilliant at stratifying what works for the characters and for the scene."

FIGHTS IN CONFINED SPACES

The challenges multiplied when, due to the demands of the script, the action sequences had to be filmed in

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THE FAST AND THE FURIOUS™



very small spaces, as occurs when Ramsey is rescued, when the fight breaks out inside a visibly narrow convoy. This was especially tough for actors as explosive as Tony Jaa, whose kinetic running, jumping and spectacular movements are an integral part of his style.

"My objective was to use all the small confined areas, and give the audience a great feeling of action, having Tony demonstrate his particular movements," says Jeff Imada. "It was nice to use traditional techniques, but also to keep things relaxed, with a certain level of improvisation, which is what the scene called for. Each of the characters uses their knowledge of the street and their experience of fighting, having to incorporate it all in a precarious setting. It's a brilliant fight."

This fight signals the direct confrontation that keeps surfacing throughout the movie between Kiet and Brian. The rivalry between them emerges immediately, characterised principally by rapid movements. In their initial fight, in the convoy crossing the mountains of Azerbaijan, Kiet comes out on top because of his strength and agility, and he manages to jump from the vehicle when it is heading toward the edge of a cliff.

Later, in their fight in Los Angeles, Brian and Kiet will once again demonstrate how brilliant they are at hand-to-hand combat. On this occasion, Brian's ingenuity prevails, and he defeats his adversary, whose career in crime is cut short by an elevator shaft.

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DODGE LANCER

The 1961 Dodge Lancer was a short-lived car that was only manufactured for two years. It was launched as a compromise model to offer Dodge an automobile in the same range as the Valiant, which from then on became a Plymouth model.

The design of the Dodge Lancer (as can be seen in this unit with station wagon bodywork) was somewhat overelaborate, with a lot of chrome, to differentiate it as much as possible from the more modest Plymouth Valiant.

The company, which had previously used the name Lancer for the two-door hardtop version of the Dodge Coronet (the one used for the development of the Dodge La Femme aimed at women drivers), revived this name for a new model launched in 1961. The Lancer was merely a more deluxe version, with aesthetic differences, of the earlier Dodge Valiant that the brand shared with Plymouth and which was definitively assigned to that brand in 1960. Built on the Group's A platform, the Dodge Lancer was marketed with two or four-door sedan, four-door station wagon, and two-door hardtop coupé bodywork, and it had a different front, with a complete grille, and in-house designed taillights to differentiate it from the Plymouth. Inside, it was a more luxurious, better-equipped car than its twin. The engine used was the group's standard straight-six, with 2.8 litres of displacement producing 101hp, although the car could be ordered with the option of another similar engine (3.7 litres producing 145hp). The Dodge Lancer was manufactured until 1962, the year when the company launched a new model in that segment, the popular Dodge Dart.



Advertisement in which the Dodge Lancer's lower price and smaller size is highlighted with regard to the competition.

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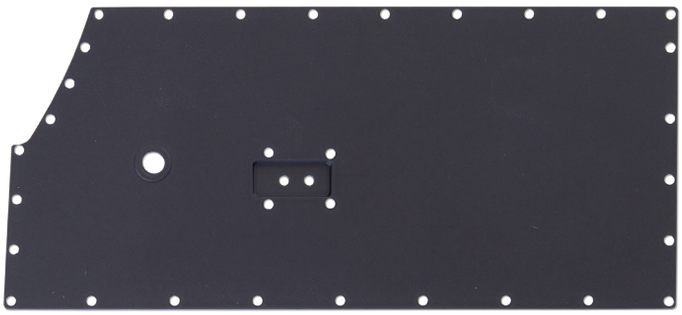


RIGHT SIDE INNER DOOR PANEL

In this assembly session you will attach some new components to the right door.
Please follow our assembly instructions and accompanying illustrations carefully.

PIECES FOR THIS STAGE

91A



91B



91C



91D



91E



91F



AP



OP



91A Inner panel right door
91B Door handle base
91C Door handle
91D Lower window profile
91E Profile mounting bracket 1
91F Profile mounting bracket 2
AP Screws 1.7 × 4mm (× 8) *
OP Screws 1.5 × 3mm (× 4) *

* 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.

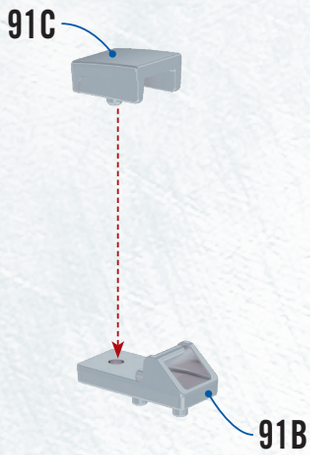
ASSEMBLY AREA



RIGHT DOOR

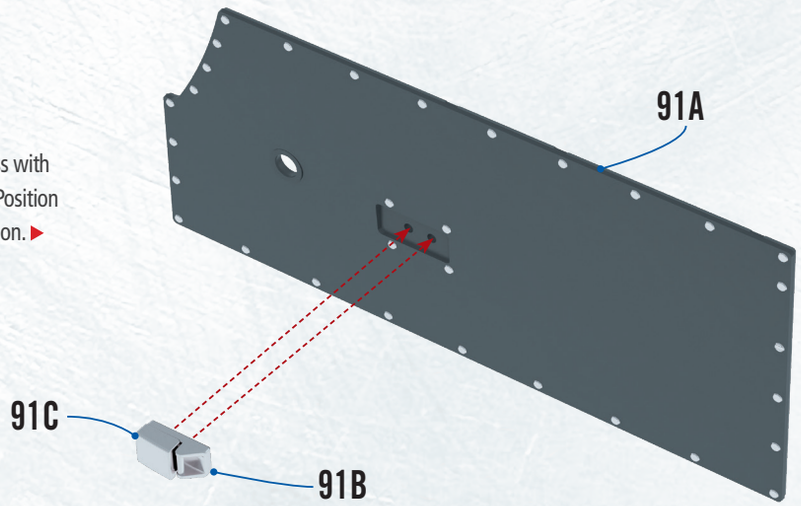
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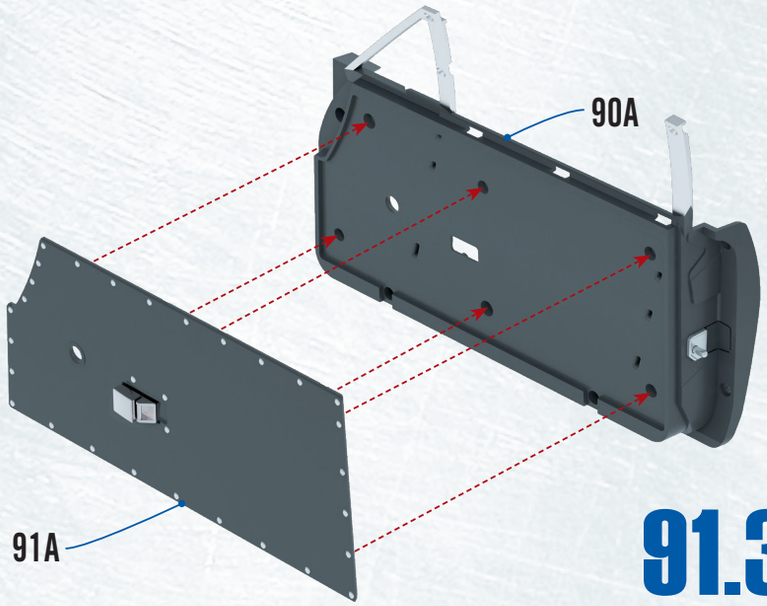
Right side inner door panel



91.1 **ATTACH** the right door handle **91C** to the flat side of its base **91B**. ◄

91.2 **NOW PUT** the piece in the recess with two holes in the inner panel **91A**. Position the pieces as shown in the illustration. ►



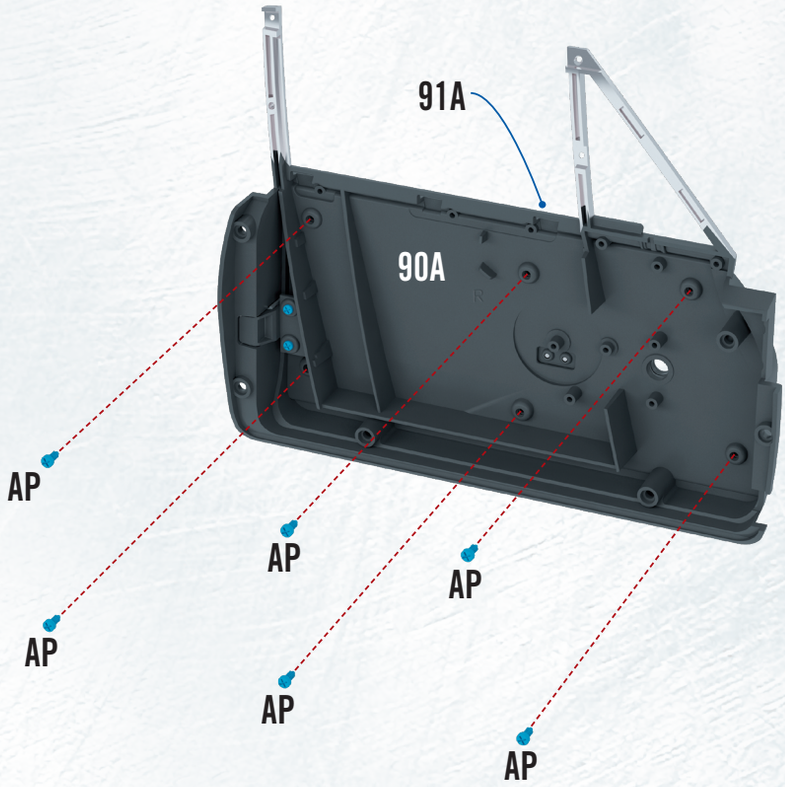


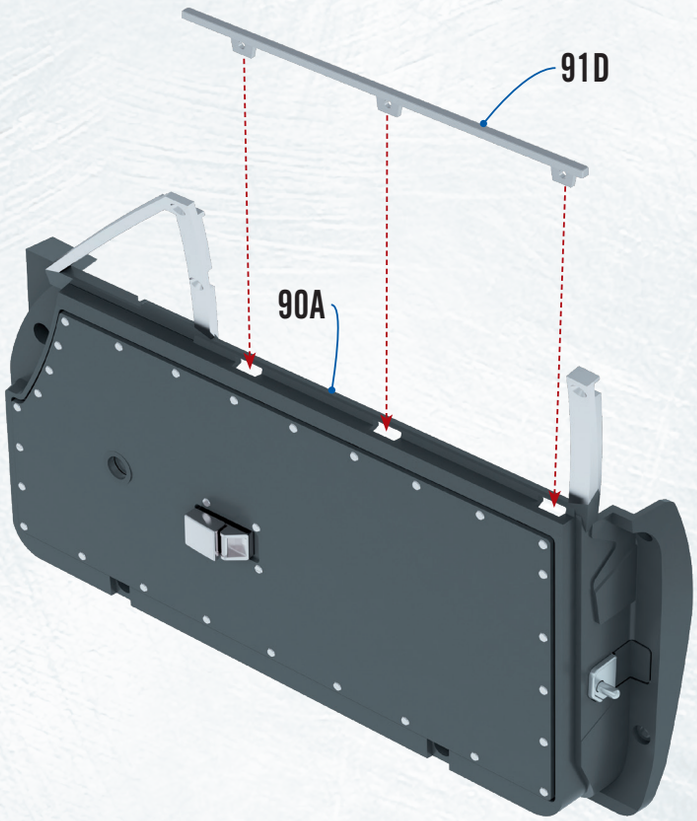
91.3 **GET** the door you assembled in the last assembly session. Attach the inner panel **91A**. ◄

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91.4 **SECURE** the inner panel **91A** with six **AP** screws. ▶



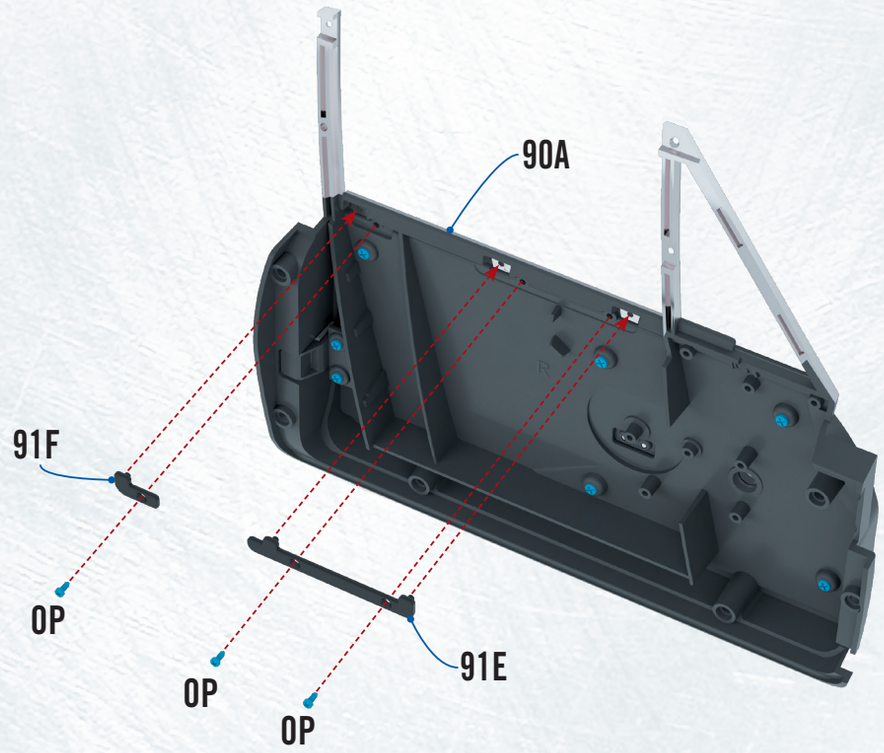


91.5 **INSERT** the three tabs on the lower window profile **91D** into the slots in the inner section of the right door **90A**. ◀

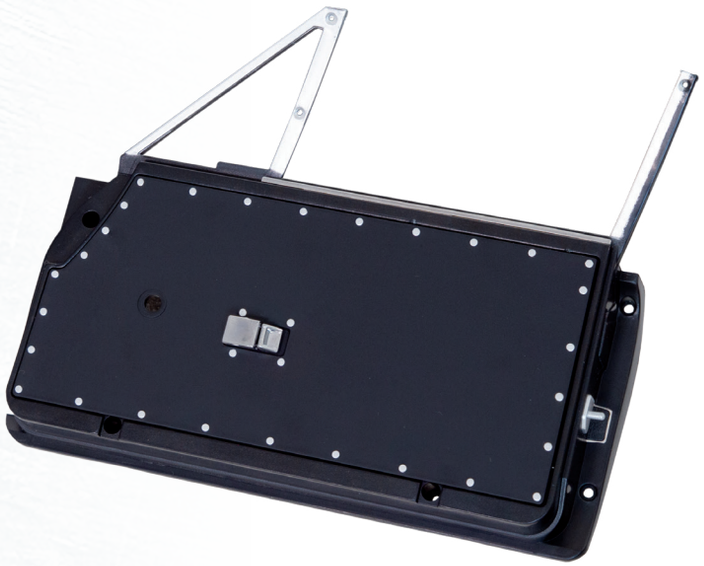
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Right side inner door panel

91.6 **ATTACH** profile mounting bracket 1 **91E** using two **OP** screws. Now put profile mounting bracket 2 **91F** in its correct position and secure it with another **OP** screw.▼



RESULTS OF STAGE 91



You have now attached the inner panel, the door handle, and the lower window profile to the right door.

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EXCESS ENGINE HEAT



The thermal energy produced by the engine during the combustion process is never fully used. Much of it is dispersed through the exhaust, and a good part is absorbed by the components that are in contact with the combustion gases. Getting rid of that excess heat is fundamental to the engine's integrity.

As we have seen before, due to the combustion that takes place inside the cylinders the chemical energy contained within the fuel is transformed into thermal energy. The amount of heat developed during each cycle is closely linked to the amount of fuel burned. This, in turn, is related to the mass of the air introduced into the cylinders.

In four-stroke engines, you cannot deviate too much from the correct stoichiometric dosage (i.e. correct from the chemical point of view). To burn more of the

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Excess engine heat



fuel, it is essential to introduce as much air as possible during each intake phase. As a result, volumetric efficiency must be increased as much as possible. In the case of supercharged engines, we need to increase the feed pressure. Similar considerations apply to diesel fuels, although there is not much leeway here for varying fuel delivery to the combustion chamber.

We must also consider that the quantity of heat developed per unit of time is also a function of the engine's rotation speed. Therefore, high-performance engines that have very high-energy phases (i.e., a very high effective average pressure) and a very high rotation speed are subject to high thermal stresses. The power strokes within the cylinders create a great deal of heat, as you can imagine.

The metal cylinder walls absorb a great deal of this heat and must constantly be cooled to avoid overheating.

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DISPOSING OF THE HEAT

As the heat builds up, it becomes essential to dispose of as much of it as possible. The cylinder walls experience a high thermal flow that is transmitted by conduction from the higher temperature areas (those that are in contact with the combustion or exhaust gases) to those at a lower temperature (those that are in contact with the refrigerant fluid that removes the heat). The flow of thermal energy occurs due to the difference in temperature, just as electric current flows through a conductor due to a difference in voltage, or fluid flows due to a difference in pressure.

Based on the thermal balance of an engine, approximately one-third of the total thermal energy generated by combustion is used effectively. The remaining energy is discharged from the exhaust or transferred to the cooling system to prevent components like the pistons, cylinder head, valves and cylinders from

Approximately one-third of the total thermal energy generated by combustion is used effectively, while the remaining energy is discharged from the exhaust or transferred to the cooling system.

Excess engine heat

overheating. If the engine overheats, it could lead to malfunctioning of the individual parts and even put engine integrity at risk.

The disposal of heat is fundamental for several reasons. Firstly because the load capacity of the lubricant film that separates the moving parts decreases as the temperature increases until it reaches a level of chemical degradation that prevents it from carrying out its purpose correctly. Secondly, as the temperature rises, the parts expand in size. These dimensional variations create changes in the tolerances and clearances inside the engine.

Another effect of excessive temperature is linked to the loss of the mechanical characteristics of some materials, such as aluminium alloys. It can also create distortions and stresses within the materials themselves and even result in their disintegration.

DIFFERENT TEMPERATURES

Not all areas of a component work at the same temperature. This is especially true for larger parts, where the temperature can vary considerably during use.

For example, the top of a piston is much hotter than the bottom of its skirt. The cylinder head tends to have a "hot" side, where the exhaust outlets are located, and a "cold" side - the intake side. To mitigate this problem, materials with high thermal conductivity are used, and careful design of the cooling liquid channels is of fundamental importance. The objective is to achieve uniform distribution of the temperatures as far as possible, bearing in mind that at some point, a different strategy will be needed.

Of course, a temperature difference will always exist between the upper and lower parts of the cylinder head. Moreover, there will always be a difference between the side next to the hot gases, i.e. the walls of the combustion

Overheating can lead to the deformation of components inside the engine - a frequent occurrence under these circumstances. The most susceptible element is the cylinder head.



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chambers and the exhaust outlets, and the other side, which is surrounded by the cooling fluid. All this is inevitable during the engine's operation. This temperature difference creates the heat flow, i.e. the passage of heat, which is later removed from the coolant fluid. After the engine has been switched off, heat continues to travel, moving from the hottest to the coolest areas until temperature equilibrium is achieved. This explains why, in some cars, the electro fan starts running after the engine is stopped.

STRESS AND DEFORMATION

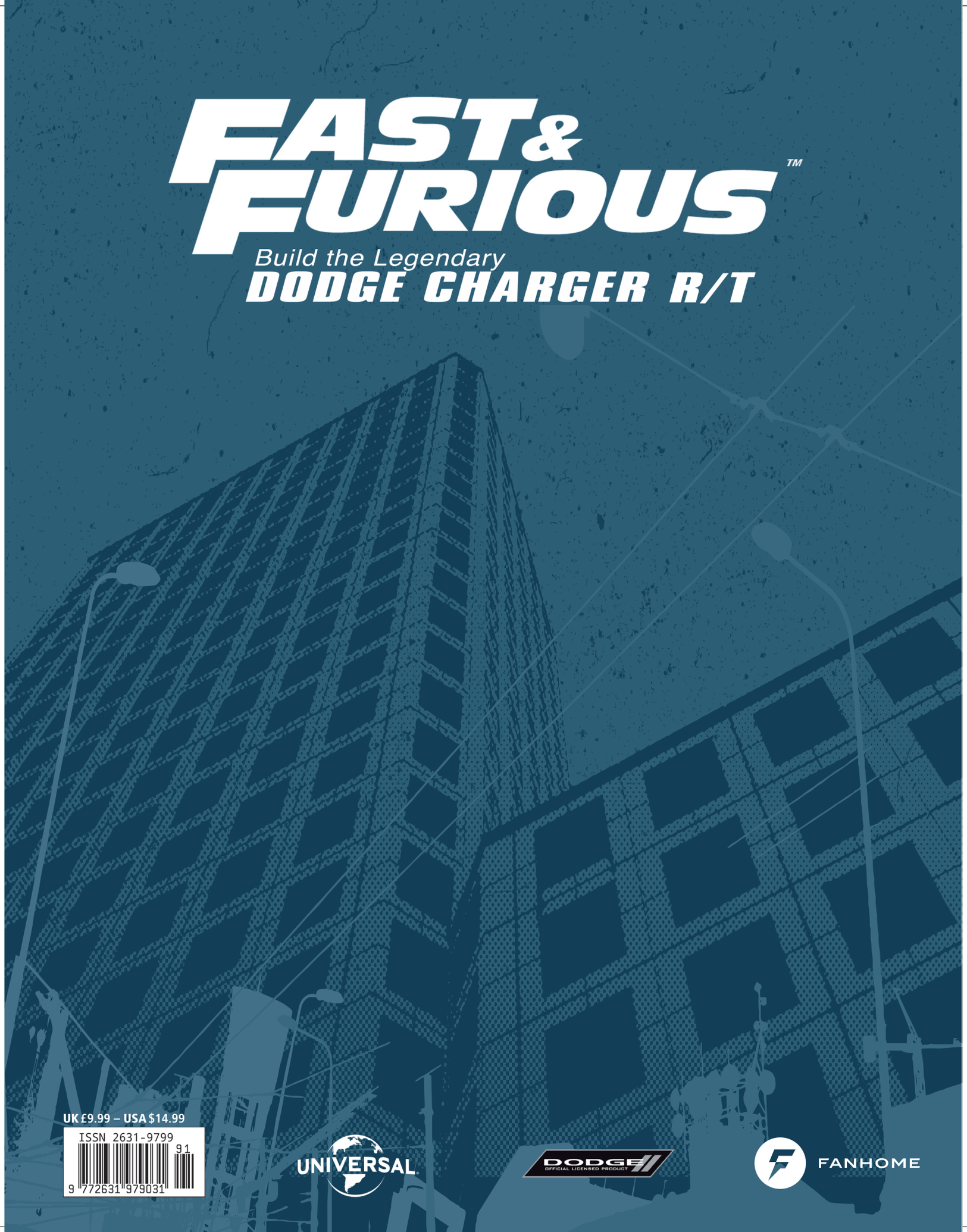
Heat is defined as thermal energy, and it can be transferred from one place to another thanks to a temperature difference between the two locations. Thermal flux, sometimes also referred to as heat flux density, is defined as the flow of energy per unit of area per unit of time. It is expressed in Joules per second. If this is indexed to the surface unit, the thermal load (i.e. the "density" of the thermal flux) to which an engine part is subjected is expressed in Watts/m^2. After heating, the components expand. The size variation is determined by the temperature increase and is indicated by the thermal expansion coefficient of the material. However, the parts may not always expand freely. In some cases, the expansion may be hindered or even prevented when, for example, there are areas with considerably different temperatures that are quite close to each other within the same component. In this case, the hottest areas are subjected to compression because they cannot expand freely, and if the temperature differences are very high, the component can become deformed. This can happen to a cylinder head if when it overheats it distorts and causes the head gasket to fail. This catastrophic event effectively stops the engine from working.



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