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AGENT BILKINS

The law is present in the *Fast & Furious* franchise in the person of FBI special agent Bilkins, a stern, demanding man who is the first to doubt Brian O'Conner's ability as an investigator, although in the end he becomes his main defender.

Agent Bilkins has a striking physical presence. Tall and well-built, his head is completely shaven and he has a discreet moustache. From the moment we meet him, it is clear that the power he has achieved in the FBI has not been due precisely to his kindly manner. Bilkins does not seem to be someone who is bothered about making a lot of friends.

THE HUNT FOR TORETTO

In *The Fast and the Furious*, agent Bilkins has been sent by the FBI to supervise an undercover operation by the Los Angeles police department. Its size and importance has made it advisable to have federal agents present. An unknown gang of fast car drivers is robbing trucks in the outskirts of Los Angeles. Sergeant Tanner, of the city's police department, has decided to send one of his best men, Brian O'Conner, into the world of street racing, suspecting that he might find some connection with the robbers there. However, right from the start, Bilkins doubts O'Conner's ability. In fact, in his first encounter he rebukes him for having wrecked a 1995 Mitsubishi Eclipse. "That was an $80,000 vehicle, officer." Then he produces the figures to show him the

The FBI played an important role throughout the *Fast and Furious* saga. In the first editions, the bureau was represented by Agent Bilkins.

seriousness of the case they are involved in. "Four hijackings in two months, and we have nothing. The DVD players and digital cameras were worth $1.2 million, which brings the grand total to $6 million plus."

As the investigation proceeds, agent Bilkins names Dominic Toretto as one of the prime suspects. This unbeatable driver's violent past makes him the perfect choice as the guy behind the truck heists. He therefore begins to put pressure on O'Conner to find clues that will incriminate Toretto.



ON THE WRONG TRACK

Given the growing admiration he feels for Dom and the fact that he is getting intimately involved with his sister Mia, Brian wants to believe that the Torettos are innocent. Although Bilkins is putting pressure on him, he does not want to present any evidence against them. But the truck heists are starting to become a serious problem that is even arousing the concerns of some politicians. And the politicians are demanding results from the FBI. "My superiors are flying in from D.C. in two days. I want something to show," says Bilkins.

As Brian has focused his attention on Johnny Tran and his gang, a group of small-time crooks who control the Asian neighborhoods of Los Angeles, the FBI wants to launch an operation that will solve the case.

Despite only having circumstantial evidence against them, Bilkins and Tanner head an operation to simultaneously arrest Johnny Tran and his followers. It all goes off quickly and without incident. However, it is impossible to find any evidence to link the men arrested with the heists, and so the operation ends in failure. Tran's father bails him out and manages to get them all freed. When he finds out, Bilkins asks Brian: "Is this the kind of intelligence I can expect from you, O'Conner?" "You're going to put this on me?" the undercover cop shoots back. He had already warned them that they didn't have solid evidence against Tran. "I can put it on whoever I want to. Perks of the job," Bilkins replies condescendingly.

BACK IN ACTION

As was to be expected, the disastrous operation against Johnny Tran makes Bilkins doubt Brian O'Conner's ability to solve the case even more. The FBI agent keeps pressuring the undercover cop to move in just one direction: Toretto. And in the end he gets his way.

Despite Bilkins's apparent mistrust of Brian in *The Fast and the Furious*, things change when their paths cross again in the second movie in the franchise. In *2 Fast 2 Furious*, the big threat now is not truck heists but drug trafficking. The Customs Service and the FBI are on the trail of a trafficker of Argentinian origin, called Carter Verone, who has set up business in Miami. Although they have managed to place an undercover officer in his organization, detective Monica Fuentes, they need someone else to speed up the operation. And who is Bilkins thinking of? Brian, of course. And how does he convince him? Well, not exactly with kindness. "Here's a list of the laws you broke in L.A. … you know the rap sheet. Now, we can make this go away in the interest of justice, if you're willing to play ball."

BILKINS' MAN

It is amusing to see how in the second movie in the series, the relationship between Bilkins and O'Conner changes radically. Whereas in the first movie, the FBI agent suspected over and again that the undercover cop was not up to the job, now the tables have turned. Brian is Bilkins's first choice. Despite allowing Toretto to escape after it was confirmed that he and his team were responsible for the truck heists, the ex L.A. cop has earned the FBI agent's absolute admiration. On this occasion, while it is the people in the Customs Service who don't trust Brian an inch, Bilkins supports him constantly, even getting an old friend of his to help him on the mission: Roman Pearce.

Bilkins is now remarkably more relaxed than in the first film. This is even reflected in the clothes he wears. In the first movie he always appeared in a suit, but here we see him wearing Bermuda shorts and a flowery shirt.

As the operation against Verone progresses, many agents suspect that Brian and Roman will get away as soon as they can, so they demand that they be made to wear devices in order to locate them at all times. Bilkins on the hand shows that he has blind faith in his guys until the end. And once the mission is over, it's no problem for him to keep his word and wipe Brian O'Conner's rap sheet clean. And, although you don't see it in the movie, could he also have had something to do with the fact that we see Brian working officially for the FBI in the fourth movie in the franchise?

THOM BARRY

One meter eighty-five tall and with a deep voice, this Afro-American actor and producer is a striking presence at close quarters. Possibly because of that, the director Rob Cohen wanted him for the Fast & Furious franchise, where he plays the charismatic agent Bilkins of the FBI. His real name is Thom Gross and he was born in Cleveland, Ohio. When he finished high school, he enlisted in the air force and was posted to a base in South Korea. Military life, however, did not suit him. Back in the USA, he took a while to discover that his true vocation was acting. In the mid-1990s he began playing small parts in movies and TV series, like *Apollo 13* (1995), *The Client* (1996), *Space Jam* (1996), *The Incredible Hulk* (1996) and *Diagnosis Murder* (1997). Yet it was his appearance as agent Bilkins in The Fast and the Furious, first, and *2 Fast 2 Furious*, later, that really made him a popular name. And his popularity continued thanks to his appearances on TV, playing congressman Mark Richardson in *The West Wing* (1999-2003) and veteran police detective Will Jeffries in *Cold Case* (2003-2010).



Johnny Tran and his gang become one of the main targets for Agent Bilkins, in *The Fast & the Furious*.



THE DODGE MARQUE IN ARGENTINA

In 1916, Argentinian businessman Julio Fevre obtained a license to import Dodge Brothers models. This was the beginning of a long relationship between Fevre (later Fevre y Basset when Diego Basset joined as a shareholder) and the Chrysler Group, which made it possible for Dodge to become a popular brand in the country.

In 2018, the number of vehicles in use in Argentina reached an all-time record of more than 13 million, the equivalent of one vehicle for every three inhabitants. International manufacturers are seeking to consolidate their share in this market despite the ups and downs of the local economy.

Fevre first imported Dodge models, and from 1931, after taking over a small firm importing Chrysler models, he began assembling vehicles locally. After World War II they moved from the original plant to a second, larger plant in the city of San Justo. In 1959, Chrysler and Fevre y Basset signed an agreement by virtue of which Chrysler manufactured the parts and Fevre y Basset assembled and sold the cars. The first models with the engine and transmission manufactured in Argentina were industrial vehicles, including the D100 pick-up, the first to be sold under the Dodge marque. At the same time, production began of the Valiant V-200 sedan, based on a Plymouth model. The production of Dodge brand cars did not begin until 1968, after Fevre y Basset and Chrysler had merged. The model chosen was the Dodge Polara and the same marque, Dodge, was used for the whole range of industrial vehicles. Many variations of the Polara were manufactured, among them the GTX sports car, and in 1971 the range was completed with the Dodge 1500, a more compact and less expensive model of European origin that was a huge success in terms of sales. In 1980, Volkswagen purchased Chrysler Argentina and ceased manufacturing the Polara. This was not the case with the 1500, which was sold until 1982 under the Dodge brand and until 1990 as the Volkswagen 1500.



Norberto Fontana is an Argentine racing driver who has competed internationally. In 2006, he won the Turismo Carretera (Touring Car race) driving a Dodge Cherokee.



ASSEMBLING THE ENGINE HOUSING (II)

In this assembly session you will continue to assemble the engine housing, which is the area under the bonnet that contains the engine of your model.

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.

PIECES FOR THIS STAGE

23A



23B

AM



23A Right panel 1 — 23B Right panel 2 — AM Screws 2 × 4 mm, (x 4)*

* Some of the parts are spares.

ASSEMBLY AREA



ENGINE HOUSING

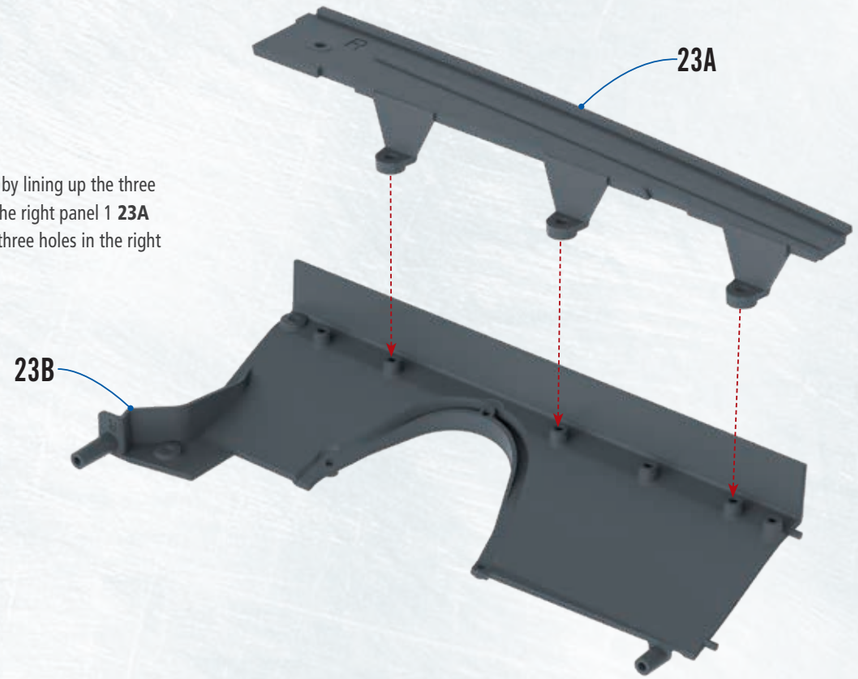
Assembling the engine housing (II)



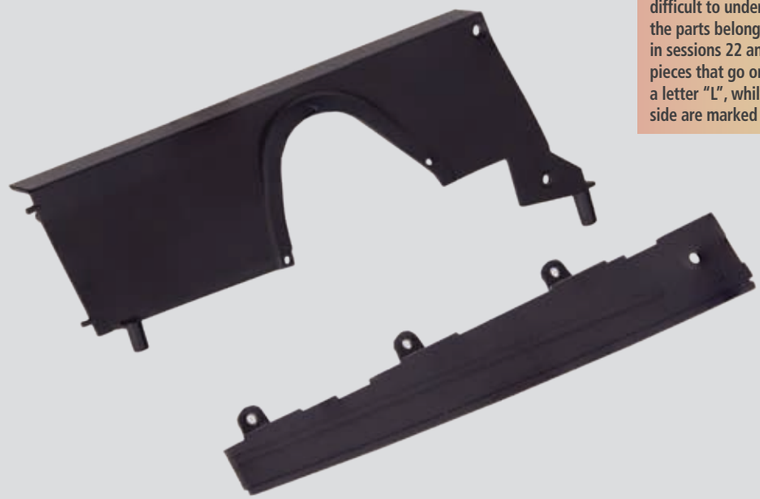
This illustration shows the position of the right panel of the engine housing inside the model.
The front panels of the engine housing form the structure that houses the engine and the various components that make it function correctly. This structure has a large opening at the front, where the radiator is located, and smaller openings at the back, one for the steering column and one for the brake master cylinder tube.



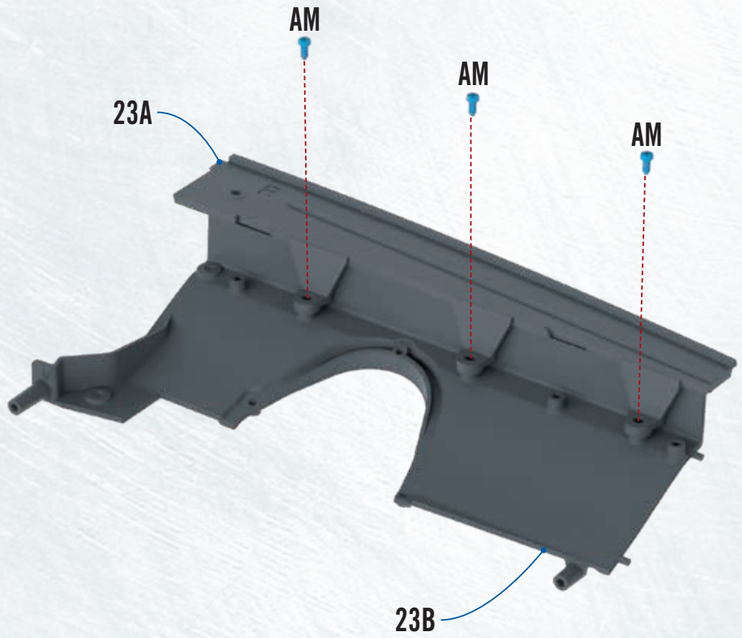
23.1 **Begin** by lining up the three holes in the right panel 1 **23A** with the three holes in the right panel 2 **23B**. ▶



USEFUL TIP
Sometimes, when assembling the parts, it can be difficult to understand which side of the model the parts belong to. This is the case, for example, in sessions 22 and 23. Note, however, that the pieces that go on the left side are marked with a letter "L", while those that go on the right side are marked with the letter "R".



Assembling the engine housing (II)



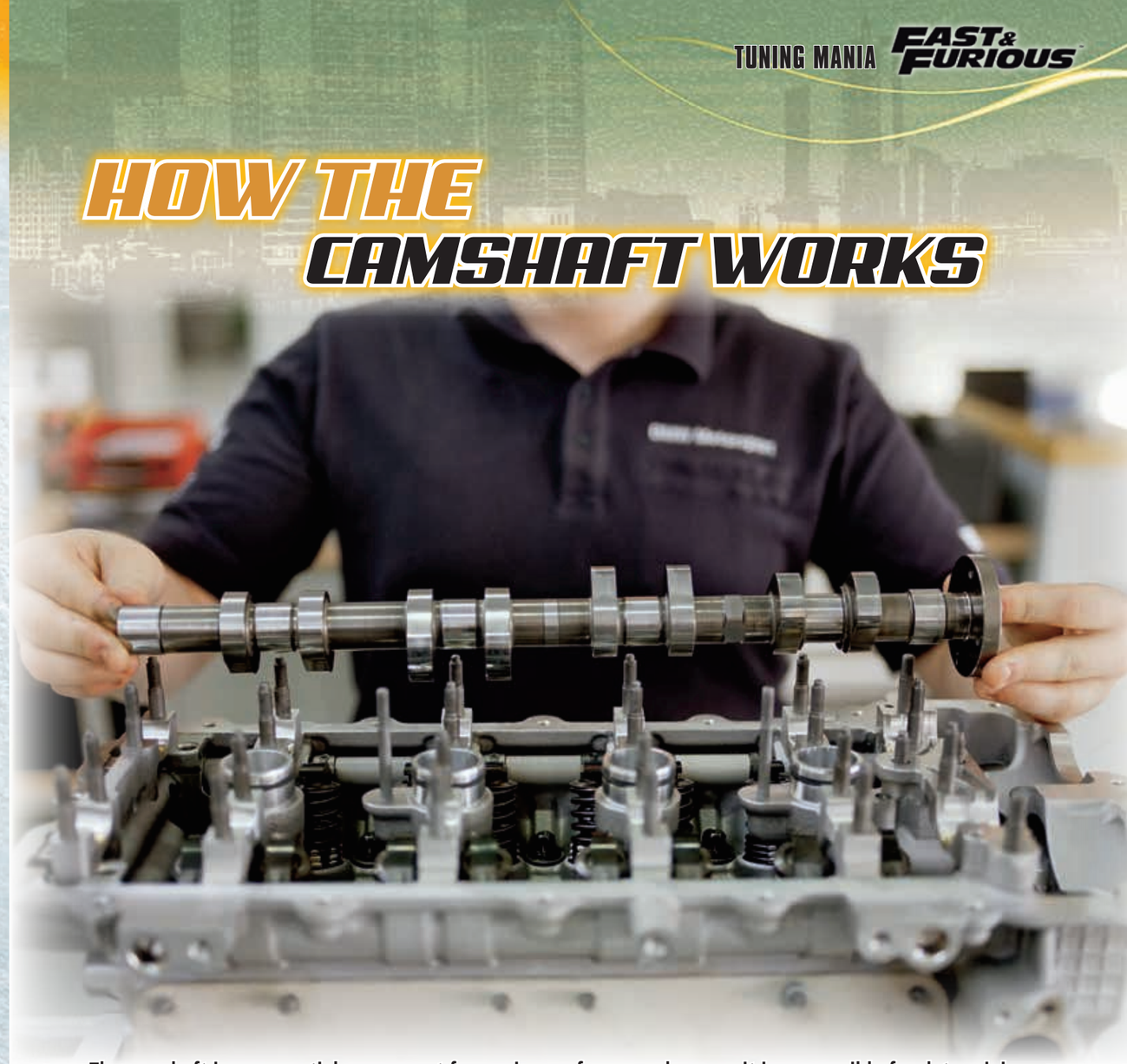
23.2 **ONCE** you have aligned the two panels, join them with three **AM** screws. ◄

STAGE 23 FINAL RESULT



You have finished the right wall of the engine housing. Keep it in a safe place until you are ready to attach it to your model.

HOW THE CAMSHAFT WORKS



The camshaft is an essential component for engine performance because it is responsible for determining when and by how much the inlet and exhaust valves should open. In this edition, we will examine the component and how it works.

In four-stroke engines, it is the valves that allow the flow of fuel to enter the cylinders, and the exhaust gases to escape, by opening and closing at the right times. A rotating camshaft raises the spring-loaded valves at the beginning of the intake or exhaust phases and then releases them to close again. The engine operating cycle happens over four phases that coincide with two piston strokes per camshaft rotation. The camshaft raises and lowers each inlet or exhaust valve just once per engine revolution. Therefore it must turn at exactly half the speed of the crankshaft. Since the valves must start to open and close at precisely the right moment, i.e. with equal advances and delays in relation to the Top Dead Centre (TDC) and Bottom Dead Centre (BDC) of the pistons, the camshaft must be accurately "timed" in relation to the crankshaft.

The profile of the cams determines the actions of the valves and therefore influences performance.

TIMED MOVEMENTS

The valves open a certain number of degrees in advance of the dead spots of the pistons. (TDC for the intake



Some standard engines are now equipped with tubular camshafts like the one in the photo. However, this technology is not used for shafts intended for high-performance engines, where the stresses are very different.

and BDC for the exhaust) and close with a specific delay with respect to those dead spots, for two distinct reasons: firstly, because the valves need time to open and close. A valve cannot move instantaneously from the closed position to the maximum open position and vice versa. The movement of the valve is linear – along the stem of the valve – in a smooth, controlled, in-and-out motion. When it is fully extended, the valve is fully open. The second reason is that, with the ability to advance or delay the action, it is possible to exploit the inertia of the gases and the pulsatory phenomena of the process to improve the efficiency of the engine significantly. If inertia and pressure waves were not used to advantage, it would not be possible to achieve significant volumetric efficiency, as is the case in all modern high-performance engines.

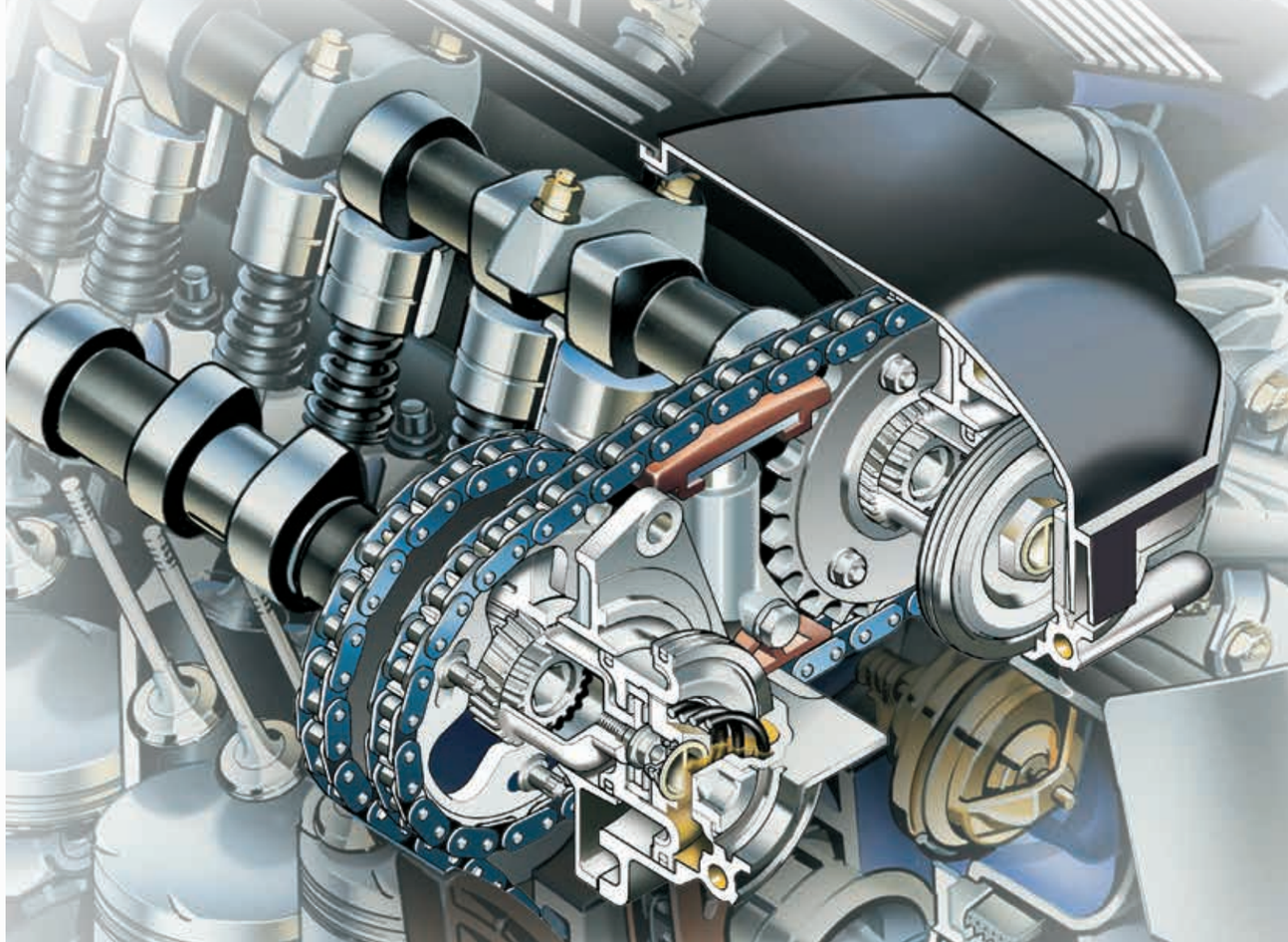
CAM FOLLOWERS

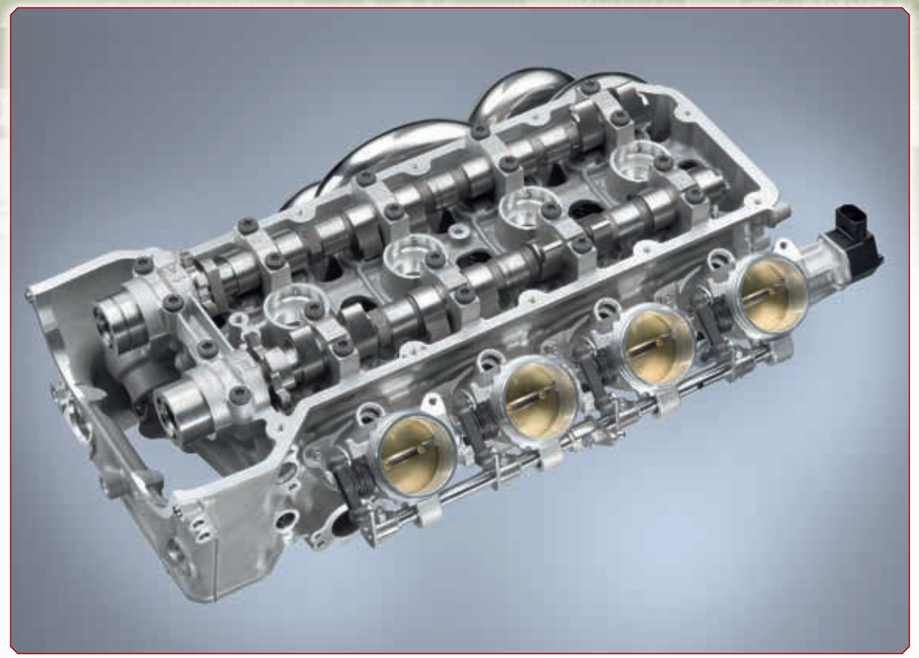
On overhead cam (OHC) engines, the cams do not act directly on the valve stems but action them through components called cam followers, or valve lifters. These have the function of converting the rotational movement of the camshaft into the linear motion of the valve stem. With push-rod engines, a cam inside the engine pushes a rod which raises one end of a "rocker" (a kind of see-saw) and forces the valve downwards with the other end. In this case, the cam follower is called a "tappet". For OHC engines there are two basic lifter designs, a Flat Bottom and a Roller Lifter. The Flat Bottom lifter is made of a specially developed material that will endure the constant wiping pressure of the rotating cam lobe. The Roller Lifter converts that wiping force into a rolling force using a roller bearing resulting in less friction. Within both of these designs, there are hydraulic and mechanical versions. Depending on the engine's oiling system design, either type is capable of supplying oil to the upper valve train components. Hydraulic Lifters are great for a maintenance-free valve train but do have some limitations. In some performance applications where higher valve spring pressure is required, a standard hydraulic lifter might not be able to handle the extra spring load. In this case, there are "Race Design" or "Slow Design" lifters, also referred to as "Variable Duration" lifters, and they will supply a better idle quality when using a performance cam, while still getting the benefit of the upper-end power over a stock cam.

WHAT IS YOUR BEST PROFILE

The profile of the cams must always be considered, together with the geometry of the components upon which they act. Their angular positioning with respect to the crankshaft determines not only the timing (i.e. opening advances and closing delays). It also includes how the valves are raised and returned to their seats. Looking at the end profile of a camshaft, we see a central circle, a lobe with two sides, or "ramps", and a rounded tip. The tip and the ramps are designed to gradually and smoothly lift the valve and return it to its seat. This is an important factor which reduces mechanical stress and operating noise. The amount of cam lift can be calculated by subtracting the radius of the base circle from the distance between the tip of the cam head and the centre of rotation. But bear in mind that cam lift is not always the same as the maximum valve lift. If there is a rocker arm between the cam and the valve stem, we must take into account the relationship between the lengths of the arms of the rocker, as the ratio will have an effect on

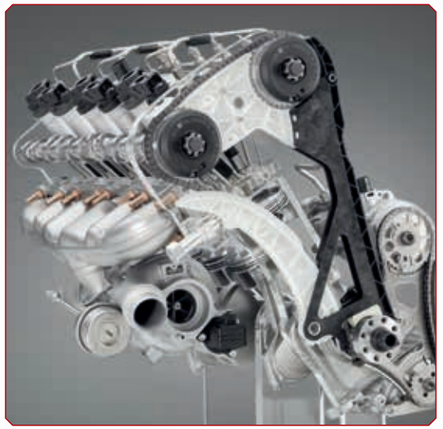
Devices are sometimes used to vary the timing during engine operation, changing the angular positioning of the camshaft in relation to the drive sprocket.





Hydraulic tappets, which are acceptable for standard engines, are not suitable for high-performance engines.

the overall valve lift. This also applies when the rocker arm is an "end pivot" or "finger follower" type. When contact takes place directly between the tappet (or rocker arm) and the cam ramp, the valve displacement as a function of the angle of rotation of the camshaft is minimal, which makes it difficult to calculate accurately. For this reason, manufacturers of special camshafts usually indicate the distributor timing that must be set by using a "dummy" valve clearance or by taking readings at a certain amount of lift. This method bypasses the ramps and gives a higher degree of accuracy.



Probably the most sophisticated and advanced system used today in the automotive field is the Valvetronic, developed by BMW. It allows the system to vary the lift, which makes it possible to abolish the traditional butterfly valve for controlling the power supply.

ROLLER CAMS

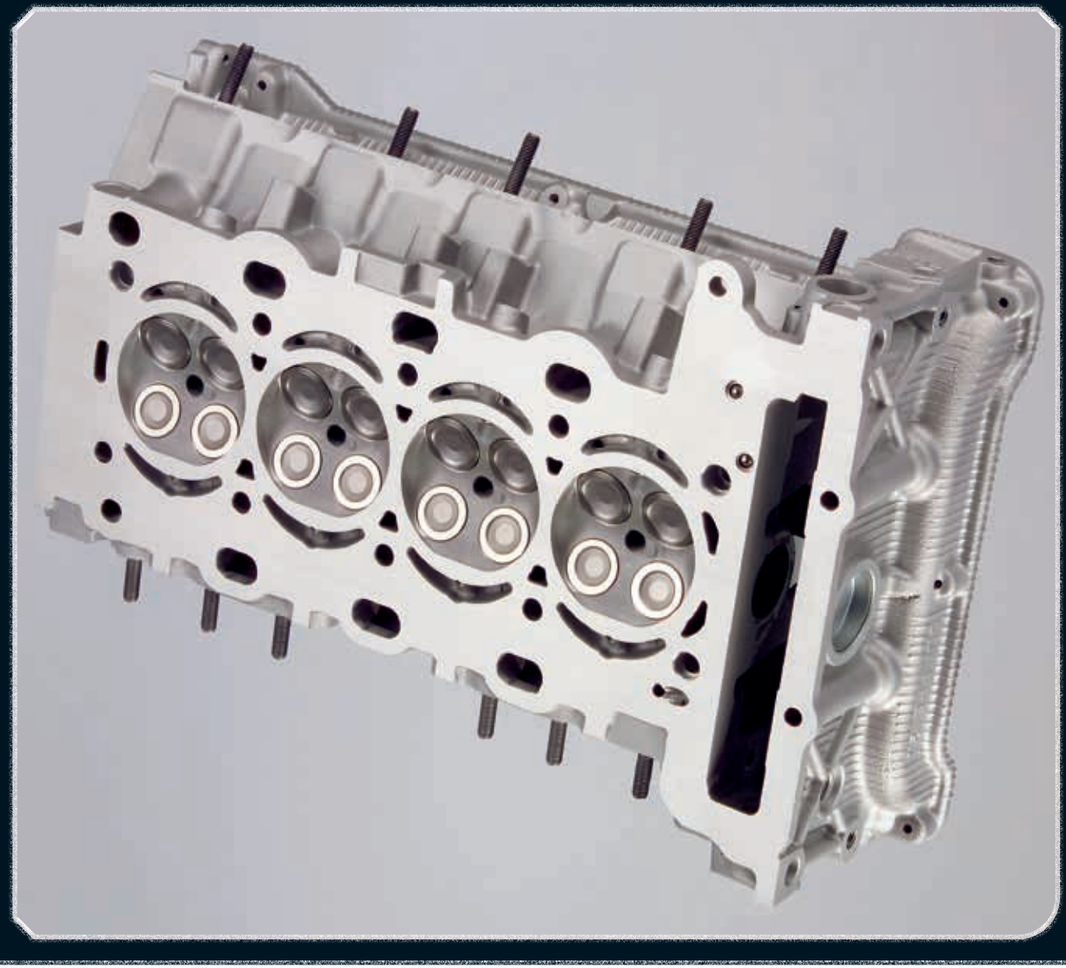
Depending on the geometry of the components positioned between the valve and the cam, the cam profile needed to obtain a smooth operational lift curve can also vary considerably. In fact, there are some "pointed" cams and some decidedly "rounded" cams that give exactly the same curve! Therefore, the shape and arrangement of the cam followers must always be considered, as well as the profile of the cam itself. It is not only the ratio between the lengths of the arms that comes into play but also the radius of the curvature of the lobe. Sometimes the rocker arms, and also the cam followers, can be rollers instead of a flat surface. The rocker arms come into contact with the cam lobe by means of a roller, which is generally chrome plated to avoid premature wear, given the very high pressures involved. Rollers with a large diameter are often used to reduce friction.

WHICH ONE TO CHOOSE?

Some of the camshafts proposed by the specialists have a slightly higher lift than the original, which results in faster movement of the valves and other related parts. In other cases, the lift varies only slightly from that provided by the standard camshaft, but the opening advances and closing delays are significantly greater. Finally, other specialists propose a modification of both the timing and the maximum lift, sometimes by a considerable amount.

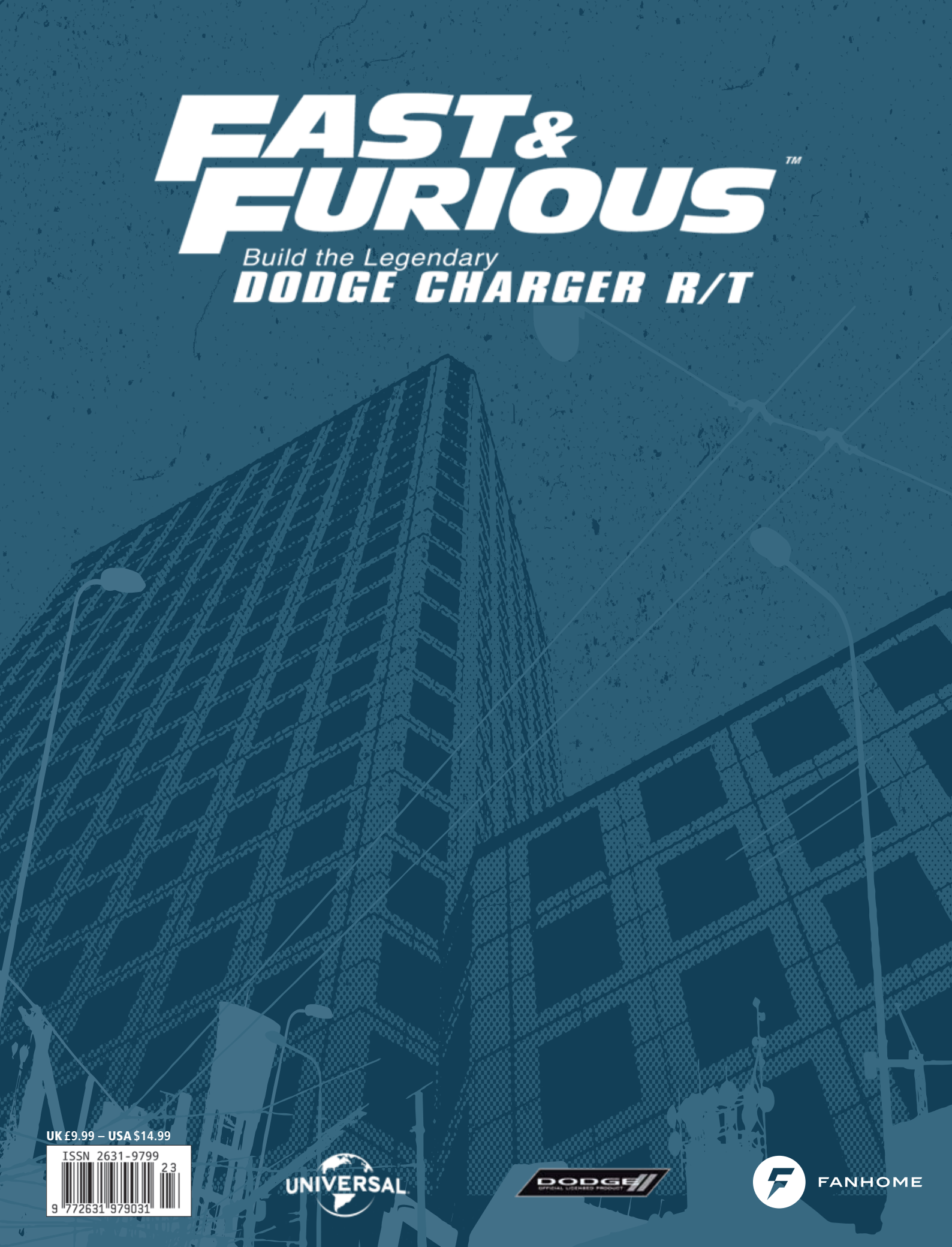
"Cleaning" the combustion chamber

As you know, the opening of the inlet valve must begin just before the top dead centre (TDC) of the exhaust stroke, and the exhaust valve, through which the burned gases exit, must close just after that. The period during which both are raised from the seats, even partially, is called the overlap, and it is of great importance for two reasons. First of all, it serves to exploit the extractor effect of the burnt gases. This is their inertia combined with the negative pressure wave coming from the exhaust. If it arrives at the right time, it starts the movement of the fresh gases, and consequently their entry into the cylinder, before the piston has even begun to descend from TDC to BDC. In this way, the chamber is "cleaned", as the fresh incoming charge completes the expulsion of the burned gases. "Cleaning" the combustion chamber is critical since the residual burnt gases not only reduce the space available for the air and petrol mixture, but they also raise the temperature. The overlap time must be adjusted perfectly. Too long increases fuel wastage and increases HC and CO emissions, while too short reduces fuel intake and power.



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