HAUTE · COUTURE RACINGCAR

THE NEW GENERATION FORMULA RACINGCAR

JAPAN MOTOR-RACING INDUSTRY ASSOCIATION

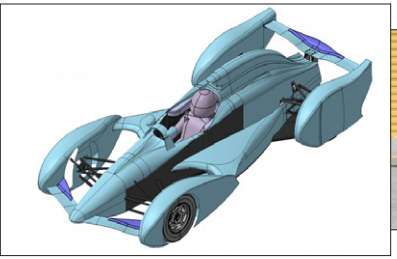
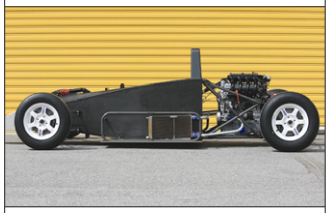
WHAT'S F20?

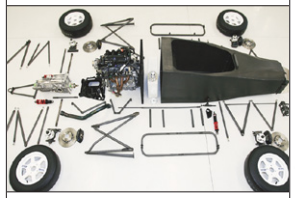
Formula 20 is a new concept in Motor racing

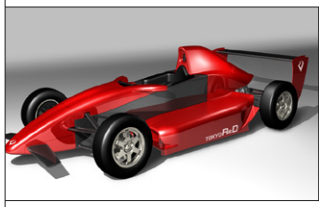
Motor racing can be generally classified into those in which car drivers compete in driving technique, such as one-make racing, and those in which participants compete in chassis development technologies, such as Le Mans 24 Hours and Formula 1. Formula 20 (F20) is a new concept in automobile racing sport, in which engineers compete solely in chassis development technologies. F20 is organized to allow first-timers to participate relatively easily, provided with design documents and components prepared by the Japan Motor-Racing Industry Association (JMIA).

Highly flexible regulations that excite the imagination

F20 is an motor racing sport that requires participants to be superior in imagination and technical expertise to win. Not to restrict engineers' freewheeling thinking, the F20 regulations only specify the restrictor diameter of 20 mm and safety requirements. Only if these requirements are strictly satisfied, can a F20 car be designed freely; it can be an open-wheel car or sports car, four-cylindered or six-cylindered, or naturally aspired or turbocharged. However, safety structures such as the monocoque, roll-over and crushable structures should be as specified by the JMIA to ensure safety.





High safety, high performance and low cost

Having an extremely robust carbon-composite monocoque that protects the driver from side impact, and designed to prevent tire-to-tire impact, a F20 car features excellent safety at a reasonable cost, which is as low as that used for the safety of Formula Junior 1600 and Formula 4 cars. The cost of the monocoque, which was a bottleneck in cost reduction, was reduced by an originally developed special manufacturing method (details described later). Using a wide variety of components and technical expertise available from the JMIA's member companies, a highly original, high-performance racing car can be produced.

Races scheduled to start in 2010

The JMIA has produced three prototypes, which are different in style, and has started to test them. In 2009, the JMIA intends to produce a few more prototypes and perform various tests to establish a racing style that will be suitable for F20. A base plan is to organize qualification races in rurally located circuits on the time-trial basis and a Grand Prix race once a year at a prestigious circuit such as Suzuka or Fuji, inviting the winners of the small races.

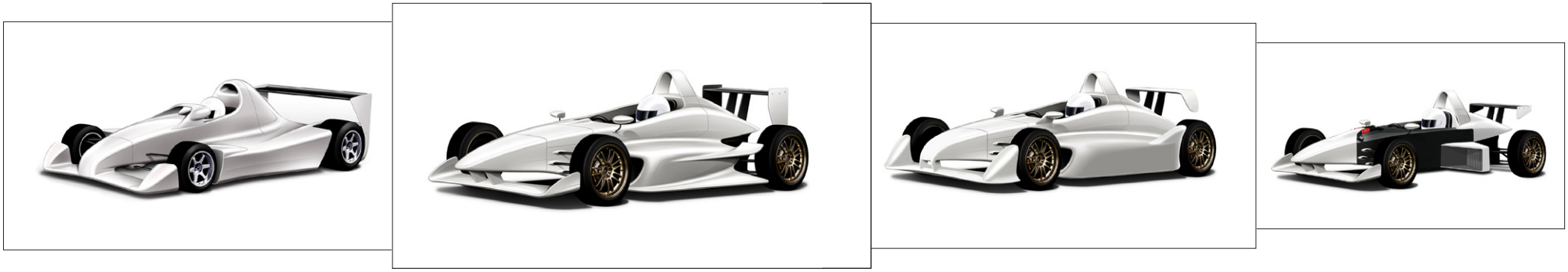
JAPAN MOTOR-RACING INDUSTRY ASSOCIATION

The JMIA is the only motor racing industry association in Japan that lists more than 50 major motor racing companies as members. It handles the most fields in the motor racing industry.

HAUTE・COUTURE RACING CAR

Racing cars for beginners are in great demand in the motor sports scene worldwide. A racing car for beginners should ideally be reasonably priced, exhibit high-performance, be safe, stylish, highly original, with ease of maintenance; however, due primarily to economical restrictions, it is extremely difficult to obtain an ideal racing car.When a racing car is purchased, not only the cost of the car itself, but also many other factors should be considered, such as the prices of replacement components, the quality of after-sales services and maintenance costs. In addition, because the components of a racing car differ in the length of service life, it would produce tremendous waste if car maintenance is performed at established intervals, such as once every several years, and if all the components are replaced at one time at the maintenance. Users should be informed of the way of using the car so as to lengthen the service life of components and have technical skills and know-how to retrofit and improve the performance of the car.

Namely, although a F20 car might be an one-make car, the racing car is not a vehicle that is purchased and consumed like a passenger car; decent expertise or an experienced partner is essential to use the car. The concept of the ready-made racing car we herewith recommend proposes an unprecedented system that enables users to obtain an ideal racing car that he or she desires and to use the car in a system that does not involve waste or require frequent purchases of a replacement car or components, taking advantage of the F20 system presented by the JMIA.



- **An ideal racing car can be produced as the user likes, by selecting from among F20 components and engines.**
- **A cowl of unique design can be produced, enabling the production of an original racing car.**
- **The use of JMIA components enables the production of a racing car made from a monocoque made from inexpensive carbon composite.**
- **Both purchasing a completed F20 car and custom ordering a car of original design are possible, satisfying all the needs of users.**
- **When the user can produce any component, it can be incorporated in the car. In other words, it is possible to produce a racing car by purchasing only difficult-to-produce components.**
- **Even when the car model becomes old-fashioned, it can be renewed by replacing the cowl with one of the latest design.**
- **It is possible to entrust the management and control of the racing car to the JMIA.**
- **The cowl alone can be replaced to use the car as a Formula racing model or sports car model.**
- **A huge variety of car components are available, enabling quick production.**

JMIA MONOCOQUE

Monocoque based on a new concept

The JMIA monocoque was developed based on a concept completely different from that of conventional racing-car monocoque. The major purpose of the development was to create a carbon-composite monocoque that has to be as inexpensive as aluminum monocoque, thus dramatically improving the safety of racing cars for beginners, which could not help using low-safety pipe frames and aluminum monocoque for cost reduction, thus enabling beginners to enjoy car racing at ease.

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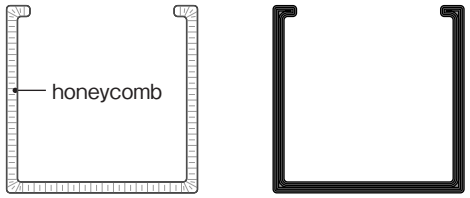

A racing-car monocoque generally has a honeycomb structure, which is sandwiched by extremely thin carbon sheets for low weight and overall rigidity, while the JMIA monocoque uses a solid thick-wall structure and is therefore slightly heavier. However, it is strong and safe in the case of a head-on collision.

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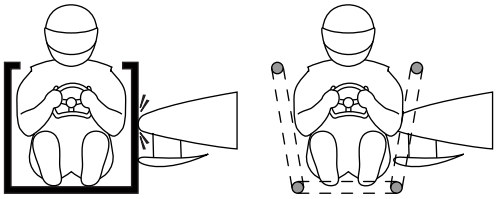

The side face of the FJ space frame consists essentially of thin aluminum sheets and cowl, and if the sharp-edge nose of a Formula car hits the frame, the nose can enter the cockpit. However, because the JMIA monocoque is covered with carbon-composite walls, the body is far superior in impact strength.

The features of JMIA Monocoque

This picture is the prototype' monocoque. It will be changed the shape when starting the development of mass production based on the results of truck test and crash test.

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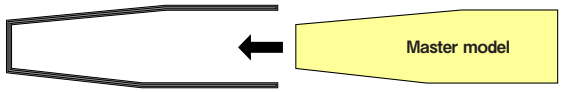

GOOD Advantages: Low cost, thick wall and high safety. The solid, single-sheet structure enables components such as suspension pickups to be arranged flexibly.

BAD Disadvantages: Heavy. The exterior surface of the monocoque tends to be relatively rough because of the special molding method (this problem has been solved).

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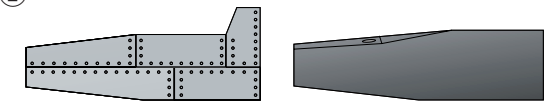


	weight(kg)	Stiffness (%)	price(JPY)	Safety(%)
S-FJ SPACE FRAME	64	50	600,000	35
F4 ALUMINUM MONOCOQUE	48	60	1,350,000	55
F-RENAULT CFRP MONOCOQUE	46	90	2,000,000	90
F3 CFRP MONOCOQUE	46	100	3,500,000	100
JMIA CFRP MONOCOQUE	42	60	1,220,000	80

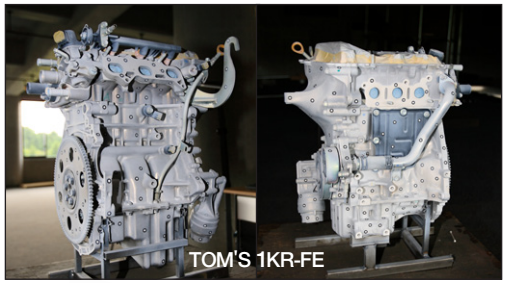
※The weight is without rear-sub frame
※Stiffness is supposed by various strengths condition
※The safety is the calculated value based on monocoque stiffness without considering the potential safety difference between open wheel and sports car.

Carbon-composite monocoque are generally light, strong but expensive. It was impossible to lower the price without changing the features. Because we were developing a new carbon-composite monocoque to improve safety, we could not compromise on rigidity. The only feature we could compromise on was lightness. The JMIA monocoque is the most suitable performance such as price, weight and rigidity for the formula beginners

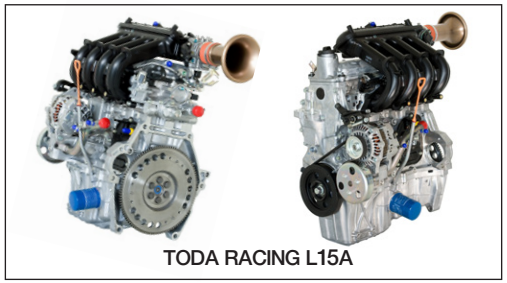
JMIA RACING ENGINE

Various model Engine are available for F20

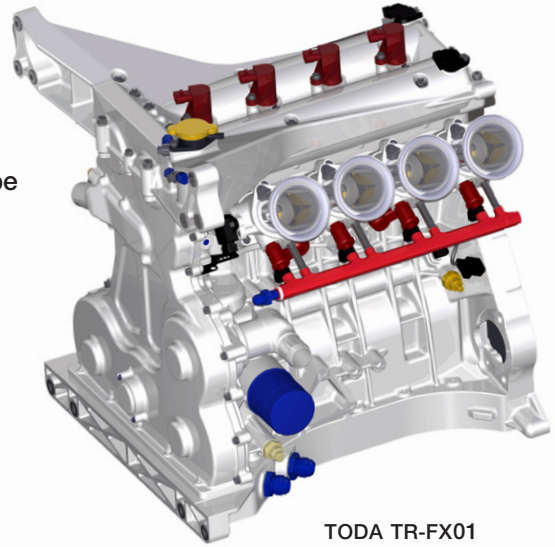
JMIA member companies currently supply or plan to supply four models of engines, which range from reasonably priced ones for beginners to full-fledged racing engines for the more experienced. Many recent racing car engines for beginners were originally designed for consumer cars. However, racing-car engines should desirably have the sound and response of authentic racing-car engines. The JMIA engines are unique full-fledged racing engine with all of its components developed from scratch for racing. It is an ideal racing engine, which not only realizes the thrilling feeling of racing but also satisfies all the features required of a racing engine, including high power, high rigidity, light weight, durability, and low cost. An original gearbox is also available from the JMIA. Like Hewland gearboxes, this gearbox can be provided for any variety of engine by means of a bell housing.



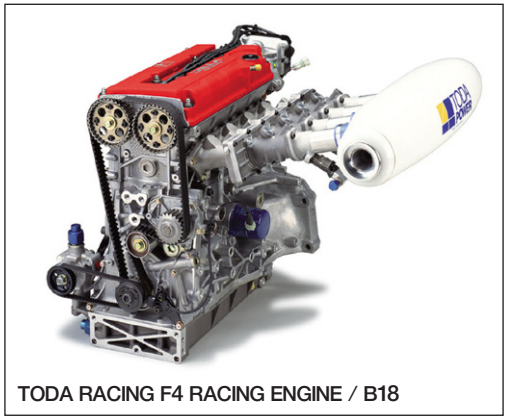
TOM'S 1KR-FE



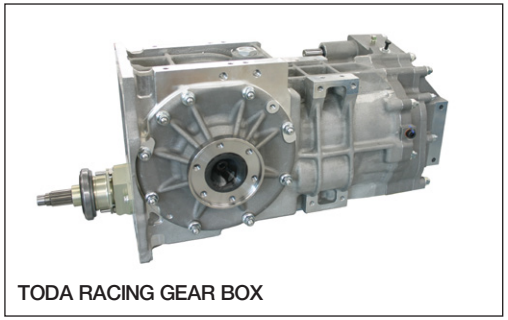
TODA RACING L15A



TODA TR-FX01



TODA RACING F4 RACING ENGINE / B18



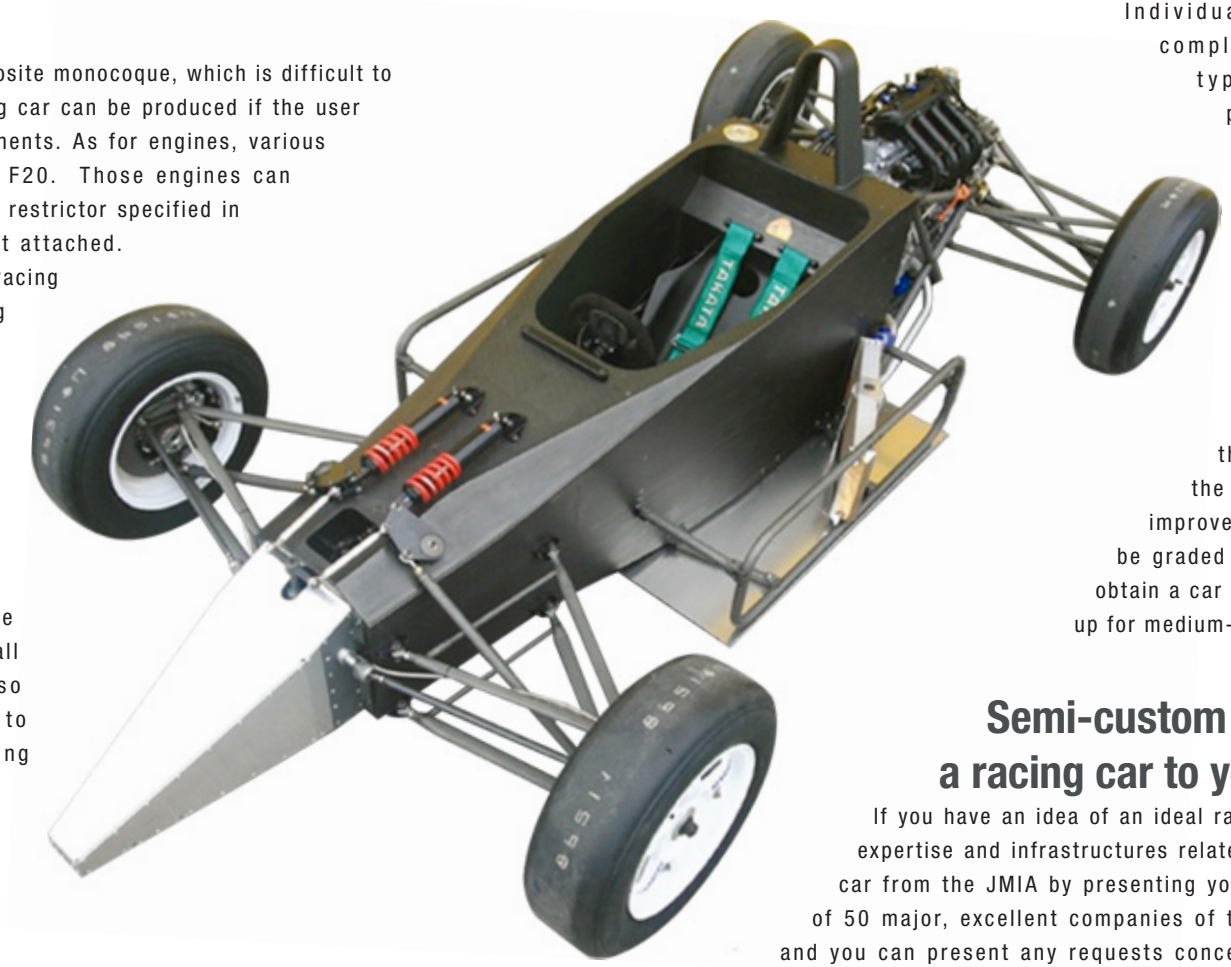
TODA RACING GEAR BOX

engine model	displacement	configuration	maximum power	weihgt	price (JPY)
TODA RACING L15A	1,496cc	inline 4	125 Hp (6,200rpm)	83 kg	760,000
TOM'S 1KR-FE	996cc	inline 3	120 Hp (6,500rpm)	60 kg	TBC
TODA RACING B18	1,796cc	inline 4	170 Hp (6,600rpm)	105 kg	2,000,000
TODA TR-FX01	1,998cc	inline 4	250 Hp (8,500rpm)	-	TBC

D.I.Y. Making Racingcar

Creating an original F20 racing car

By using the carbon-composite monocoque, which is difficult to produce, an original racing car can be produced if the user can produce other components. As for engines, various models are available for F20. Those engines can provide great power if the restrictor specified in the F20 regulations is not attached.
If an inline four-cylinder racing engine,which is being developed by the JMIA, is used authentically loud racing sound can be heard. The JMIA produces gearboxes that perfectly suit such power bands. We can support the design of the monocoque and the overall layout with drawings, so that users will be able to produce an original racing car relatively easily.



Using a ready-made F20

Individual constructors provide various completed cars ranging from Formula types and sports car types. It is possible to use those ready-made cars.Because such cars consist of standard components available commercially from the constructors, it is easy to purchase replacement components. In addition, because those parts from the constructors are produced to suit the basic JMIA monocoque and they are compatible with each other, the cars have a significant potential for improvement. For example, such a car can be graded up in stages. It is also possible to obtain a car for beginners first and then grading it up for medium-class drivers gradually.

Semi-custom ordering a racing car to your taste

If you have an idea of an ideal racing car in mind but do not have the expertise and infrastructures related to development, you can order the car from the JMIA by presenting your requirements. The JMIA consists of 50 major, excellent companies of the Japanese motor racing industry, and you can present any requests concerning the chassis, engine, etc. An ideal racing car can be completed by selecting an engine and gearbox, which are installed on the JMIA monocoque, and by requesting the overall layout and styling.

Prices (reference)

(JPY)

	Original		Semi-custom		F20	
	Development cost	1 car	Development cost	1 car	Development cost	1 car
JMIA monocoque		1,220,000		1220,000		1,220,000
Engine		600,000 ~ 2,500,000		600,000 ~ 2,500,000		600,000 ~
Components		2,600,000 ~ 4,400,000		2,360,000 ~ 3,000,000		2,360,000 ~
Cowl		500,000 ~ 4,500,000		500,000 ~ 4,500,000		400,000 ~
Design cost	6,000,000 ~ 20,000,000		3,000,000 ~ 6,000,000			
Component development cost	4,000,000 ~ 15,000,000		2,000,000 ~ 4,000,000			
Cowl development cost	4,000,000 ~ 15,000,000		2,000,000 ~ 5,000,000			
Assembly cost		800,000		600,000		400,000
Total	14,000,000 ~ 50,000,000	5,720,000 ~ 13,420,000	7,000,000 ~ 15,000,000	5,280,000 ~ 11,820,000		4,980,000 ~

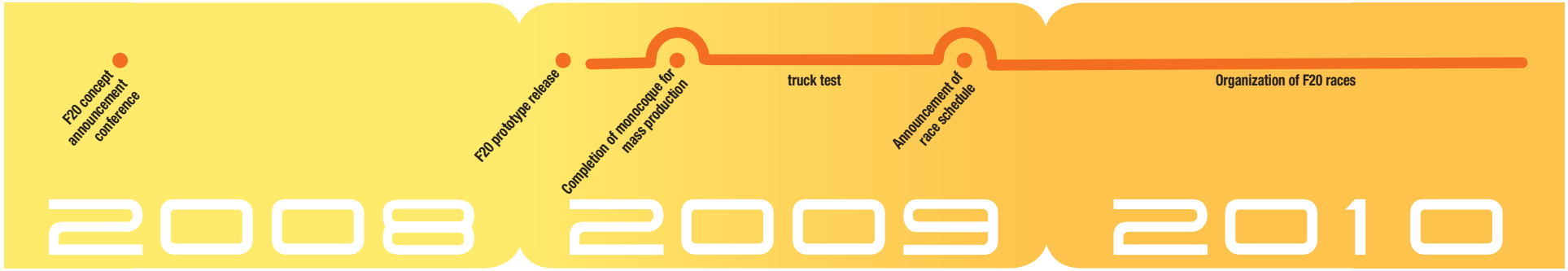
※ The cost figures are presented for reference purposes only. ※ The F20 cars are mass-produced and therefore inexpensive. The price changes depending on the number of cars produced.

※ Detailed estimates available on request. ※ The cost of a F20 car is an estimate of a car complete with minimal equipment in a rolling-chassis condition, without wheels or tires.

※ All the estimates were calculated on condition that the car is of the Formula style. ※ The cowl development cost does not include the cost of wind-tunnel tests.

F20 development schedule

After releasing three(3) F20 prototypes on January 15, 2009, we intend to perform various tests during the year and make preparations to organize F20 races from 2010. As for the monocoque, we intend to test the present prototype through actual driving and perform crush tests, to improve the design. We intend to start to produce the final product model around March 2009. Therefore, the supply of components of F20 is scheduled to gradually start from March 2009.



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