

FACT SHEET

From Vintage to Grand Prix 汽车的故事

Venue: Singapore Philatelic Museum, 23-B Coleman Street, Singapore 179807

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Opening hours: Mondays (1.00pm - 7.00pm); Tuesday - Sunday (9.00am - 7.00pm)

Admission charge: \$5 (adult); \$4 (child, 3-12 years); \$4 (senior citizen, 60 years and above). Free admission for Senior Citizens every Monday.

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In ancient times, man relied on animals like horses, buffaloes, donkeys and camels as modes of transportation. But these have speed and load limitations spurring man's quest to create a vehicle that does not depend on animal power.

With today's technology-laden transportation, research engineers and designers continue to push the limit developing more efficient, aesthetically pleasing and environmentally friendly vehicles of tomorrow.

Utility purpose established, cars also offer entertainment. Almost as soon as the gasoline-powered car came into existence, racing began. Motor racing especially the Grand Prix which attracts a worldwide following is a multi-million dollar industry. For the second time, the Singapore grand prix is raced at night on a street circuit by the Marina Bay.

HISTORY OF CARS

1700s: The Dawn of Automobiles

In the 15th century, Leonardo da Vinci designed a crude self-propelling automobile and over the centuries vehicles using all forms of power have been created and tested.

Records from the late 1700s showed exploratory ideas and designs for automobiles powered by steam, electric or gas originating from inventors, engineers and mechanics mainly from Europe.

Nicolas Cugnot, a French engineer and mechanic introduced the first steam-propelled road vehicle in 1769. Although this 3-wheeled car could move massive cannons and was able to achieve a speed of up to 6km/hr, it proved to be too heavy for practical use.

1800s: Steam, Electric or Gas Power

For a good part of the 1800s, several inventors also presented other versions of the steam-powered vehicle. In 1801, Richard Trevithick of Britain enhanced the steam engines making the boiler lighter and more powerful. This early road carriage for transporting passengers was referred to as the Puffing Devil. In 1803, he built another steam-powered road vehicle called the London Steam Carriage which attracted much attention when it was driven around London.

Isaac de Rivaz of Switzerland designed several types of steam cars but it was the “internal combustion engine” of 1807 which ran on a gas mixture of hydrogen and oxygen that was most notable. Around 1830 Scotsman Robert Anderson invented the first electric carriage. But electric cars were slow, heavy and required frequent recharging.

1878: Jumping on the Bandwagon

American inventors of steam coaches, a couple of decades later, included Harrison Dyer, Joseph Dixon, Rufus Porter and William T James. In 1878, Amedee Bollee Sr built a steam car named *La Mancelle* with an engine that sits in front, a chain drive connected to the rear wheels and a steering wheel. Dr JW Carhart, professor of physics at Wisconsin State University together with JI Case Company built a steam car that won a 200-mile (~320km) race.

By late 1870s, many men from both sides of the Atlantic have contributed to the development of the automobile. In 1878, German engineer Nicolaus August Otto patented a four-stroke engine – a system very similar to today’s car engine.

These early automobiles mainly ran on steam or electricity packs. Steam boilers were huge and cumbersome and the engines literally ran out of steam. Electric-derived batteries depleted over relatively short distances and were inconvenient to recharge.

The internal combustion engine was more complex than either steam or electric-powered engines but it was by far more powerful and easier to repair.

Germans Gottlieb Daimler and Wilhelm Maybach designed and patented a two-cylinder engine in 1889. This engine, with a V arrangement provided more power, was more compact and had less vibration. In 1894, French engineer Emile Levassor created a chassis – a frame and wheels to carry the Daimler engine. This Panhard-Levassor is very often regarded as the ancestor of the modern automobile.

1894: The First Automobile Race

In 1894, the first automobile race took place between Paris and Rouen. This first grand prix race saw some 102 entrants with vehicles powered by steam, electricity and gasoline. Of the 15 that finished the 125km (78 miles) race, more than half were gasoline powered.

1895: From Invention to Mass Production

In the US, even with a slower car development, a race took place in 1895 from Chicago's South Side to Evanston and back. The only two cars that finished, the first an American built Duryea and the second a Benz, were gasoline powered. This gave further impetus to automobile development.

Europe has good roads, some of which were built by the Romans since 3rd century BC. In comparison, the roads in the United States were narrow and riddled with potholes and the cars were therefore built more hardy and powerful.

Charles and Frank Duryea were two American brothers who built the winning car of the 1895 Chicago race. With their prize money, they started the Duryea Company and one year later the company produced 13 automobiles.

The Olds Motor Vehicle Company set up in 1899 was the first American company to build and sell cars on a large scale. But Henry Ford is considered the father of mass production. When the Ford Motor Company was formed in 1903, cars of varying price levels were produced and five years later the company introduced the famous four-cylinder Model T. Within the first year, the company sold over 10,000 Model T's.

To keep cost down, Ford bought raw materials in large quantity to produce cars in high volume and for the first time, every part of the car is interchangeable with the same model. This marked the beginning of mass production for cars.

True to Henry Ford's intention, cars became affordable to most men and with accessibility changed the landscape of social development.

1973: Green(er) Options

After the Arab oil embargo beginning in October 1973, oil prices rocketed causing a world shortage. Though it was lifted a year later, the effect was seismic. Gas-guzzling cars were shunned like a lemon.

With the knowledge of the cost of mining and using fossil fuel, cars of the future will attempt to run cleaner and more efficiently. Car manufacturers are now taking an active role in building vehicles with better fuel economy, lower greenhouse gases and improved exhaust emissions.

Several alternative fuel types are available in the market. They include:

Ethanol	<ul style="list-style-type: none">• Currently derived from corn or sugar cane
Hydrogen	<ul style="list-style-type: none">• The cleanest with emission of heat and water vapour
Natural Gas	<ul style="list-style-type: none">• Used in a liquid or compressed form (LNG CNG)
Hybrid	<ul style="list-style-type: none">• Engines that switch between petrol and electricity
Biodiesel	<ul style="list-style-type: none">• Uses plant-derived diesel such as vegetable oil and soybean - a renewable alternative fuel compared to petrol-derived diesel
Electric	<ul style="list-style-type: none">• Produces zero emission and is very economical

MOTOR RACING

Early Motor Racing

The development of the automobile heralded the advent of motor racing. The first motor racing started as early as 22 July 1894, with the 80 mile (128km) Paris-Rouen race. Manufacturers soon realised that winning cars attracted buyers and races served as promotion for the fledgling car industry.

Improvements to get a better performing racing car eventually translated to better road cars. Technical improvements were introduced; steering wheel in place of the tiller, gearbox and chain succeeded belt transmission, engine size increased and car designs started to address aerodynamics to reduce wind resistance.

These early races which ran from one town to another drew the public's attention. They were attracted to this new form of transportation that pitched the endurance of the car and driver against one another. Rules differed for different races but generally a mechanic rides with the driver and only they can work on the car enroute.

After the publicity of the French race, the United States held a race in November in Chicago and motor racing has not looked back since.

A year later in 1896, a series of races was held at a horse-racing track in Rhode Island's Narragansett Park and the spectators could enjoy the entire race from start to end for the first time. This also meant organisers could charge spectators a fee to watch the race.

Greater Thrill, Greater Spill

With faster cars and greater public interest in road races in Europe, accidents and deaths were becoming more common, not only for drivers but spectators alike. Appalled by these mishaps the authorities imposed a total ban on road races in France in 1901.

In view of this, the Belgian Automobile Club organised a six-lap closed-road race around the 53-mile (~85km) Circuit des Ardennes near Bastogne in 1902. With less restrictions and more overtaking, racing became more exciting for both drivers and spectators.

Although France won the American-originated Vanderbilt Cup twice, the Automobile Club de France (ACF) was already making preparations for the first Grand Prix. In 1900 the Gordon Bennett race, spearheaded by newspaper publisher James Gordon Bennett with the intention of injecting interest in car manufacturing outside France, was replaced by the Grand Prix.

Go the Distance

The first Grand Prix held in 1906 was located in the city of Le Mans, France. The race ran for two days with 12 laps around a 60-mile (~96km) circuit. Due to the disintegrating tar tracks in the hot sun, the race became a test of endurance for both drivers and mechanics.

At this time, motor racing was dominated by France and Italy, and Germany, Britain and United States soon joined the fray. The motor industries of these countries became aware of the benefits of racing and started to put in more resources.

Test of Endurance

Speed and endurance fuelled the interest in creating racing cars. There are different courses for different cars. Grand Prix cars race on courses that are very similar to highways. There are races around oval speedways, hot rods competing along a ¼ mile-run (~0.4km) and there are also specially built vehicles to clock record time on salt flats.

Racing cars are built to specified rules or formulas. The formula defines the power which a car produces from a certain amount of fuel intake. To get more fair results and better safety during races, the International Commission decided in 1909 to introduce an international formula of a maximum weight of 900kg and a cylinder bore no bigger than 30mm.

American Scene

Stateside, the racing scene was booming; from the Vanderbilt Cup to the construction of the oval Indianapolis Motor Speedway. Races ranging from 10-mile (~16km) to 200-mile (~320km) drew drivers and cars of various calibre but the most demanding and rewarding was the 500-mile (~800km) distance. The first Indianapolis 500 attracted some 77,000 people. Now popularly called “the 500”, this race which boasts a multi-million dollar purse and prize money is held on Memorial Day* weekend.

(*Memorial Day is an American holiday observed on the last Monday of May to commemorate the people who died while in military service to the country.)

Back in Europe, after a lapse of three years Grand Prix racing returned in 1912. The prestigious road race attracted many top drivers and winning cars and Peugeot and Mercedes were the leading makers.

For some 20 years, racing car development improved in leaps and bounds. But this came to a sudden halt when war broke out in Europe in 1914. The US was fairly untouched by the war and motor racing expanded unrivaled by their European competitors. During the four years of war, American car industry not only caught up with the Europeans but overtook them.

In 1921, the Automobile Club de France (ACF) announced the return of Grand Prix to be held in Le Mans. Technological progress in the road racing and track racing cars continued year on year but their improvements differed. Road racing,

a predominantly European event, required fast cars with excellent braking systems and highly responsive engines due to the numerous diverse road conditions. Oval track racing developed super cars which in turn heralded the golden age of racing in the US.

Around 1925, Europe started to impose a ban on mechanics riding in the racing car although a second seat and a driving mirror were required. The viability of road racing also demanded that the French racing group to build circuits and the first race in such a venue was at Montlhéry near Paris.

Dips and Turns

To prevent fatal crashes from high speeds, engine size was restricted to 1.5 litres. This did not manage to curb the speed but economics did as the roaring Twenties succumbed to recession. Many manufacturers stopped participating in the races altogether especially the top-level formula. In 1929, US attempts were made to introduce a stock car formula or commonly referred to as the 'Junk Formula', but the Wall Street crash was simply too overwhelming and car races halted.

During the 1930s, motor racing provided a form of distraction during the bleak Depression era but investment in racing technology was equally thin. Racing car design languished in this environment. When Hitler was elected to power in Germany, as a form of propaganda the government offered £45,000 to companies to build Grand Prix cars plus a substantial bonus if they won. Both Mercedes and Porsche took up the challenge and between them the two makers won practically all the titles.

War brings changes

The essence of Grand Prix racing has not changed even after a hundred years. The extreme racing machines, skillful drivers and challenging circuits have captivated a worldwide following and propelled this sport to a multi-million industry.

In 1950 Grand Prix racing introduced a World Drivers' Championship and supercharged cars started to appear especially from Italy. This was very shortly eclipsed by Enzo Ferrari who developed even more powerful engines. Racing car engine which was traditionally located in the front was now moved to the back.

Full Speed Ahead

The 1960s saw years of fending off advertising on cars melt away. Winning cars attracted massive sponsorship money and this equates to superior engines. The debut of the Cosworth DFV engine pushed the boundaries of technology and others used it as a benchmark. The DFV has delivered more Grand Prix winners than other engines. It was also a time when drivers could compete in different formulas.

Technical improvement such as aerofoil wings, slicks (tyres), double disc brakes and turbo-charge were introduced to improve car speed. Designers used carbon-fibre to make cars stronger but yet lighter, microchips to electronic systems, computers to record and study the car's performance. Borrowing from the aircraft industry, cars are pinned by 'ground effects' through applying the theory of airflow.

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RACING IN SINGAPORE

The Good Old Days

The 2008 Singapore Singtel grand prix was 50 years in the making. Singapore had a racing circuit at Upper Thomson Road where world-class races took place from 1961 to 1973.

The 4.8km long road track which skirted the water catchment area of Pierce Reservoir was the venue for Thomson Sprint for cars and motorbikes.

The inaugural race in 1961 attracted 210 entries, with participants from Japan, Malaysia, Indonesia and a handful from Australia and Britain. There were cars and motorbikes competing in various categories of power.

In 1961, tickets for general admission cost \$1 and remain unchanged even in 1972. Grandstand tickets went for \$7. Some 100,000 armed with umbrellas to shield themselves from the scorching sun as they watched their favourite drivers or riders manoeuvre the treacherous bends and corners of the Upper Thomson circuit. This race was a family event where racing enthusiasts revelled in the thrills and spills of the races and children enjoyed the carnival atmosphere in the great outdoor setting.

Singapore Grand Prix

In 2008, grand prix racing returned to Singapore after a long absence. Unlike the Upper Thomson street race, the new 5.067km long downhill Marina Bay circuit is lined with historical as well as architecturally spectacular buildings.

Barricades erected throughout the anti-clockwise route buffer the spectators from the extreme speed machines which can go faster than 300km/h.

At the end of the first ever night race, Spaniard Fernando Alonso, a double world champion, finished first to the delight of a crowd of some 100,000 racing fans.

Marina Bay Circuit

Circuit length	5.067km
Turns	23
Fastest lap	1.45.599, Kimi Raikkonen, Ferrari, 2008

World's Fastest Cars

<u>Car</u>	<u>Top Speed</u>
SSC Ultimate Aero	408.85 km/h
Bugatti Veyron	408.47 km/h
Koenigsegg CCX	417.00 km/h
Saleen S7 Twin-Turbo	402.00 km/h
McLaren F1	386.70 km/h

Popular car movies

1. Goldfinger (1964)	Aston Martin DB5
2. Chitty Chitty Bang Bang (1968)	Gen11 built around Ford V6 engine
3. The Love Bug (1968)	Volkswagen Beetle called Herbie
4. The Italian Job (1969)	BMC MK1 Mini Cooper S
5. Christine (1983)	Plymouth Fury
6. Driving Miss Daisy (1989)	Hudson Commodore
7. Thelma and Louise (1991)	Ford Thunderbird
8. Gone in 60 Seconds (2000)	Shelby Mustang GT-500
9. The Fast and the Furious (2001)	Toyota Supra
10. Cars (2006)	Disney-Pixar