Material Science Research India Vol. **7**(1), 279-288 (2010)

Overview of automobile technologies

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(Received: January 01, 2010; Accepted: February 01, 2010)

ABSTRACT

Automobile is the huge demand in the world this paper introduce to development, production and technologies of automobile in the world. Multilevel technologies are given in details, as petroleum fuels diesel, gasoline, bio-fuels, electric, hydrogen, ox-hydrogen, steam, air, gas, turbine, rocket, and jet car, etc an also mentioned future car technologies.

Key words : Automobile development, production, and technologies.

INTRODUCTION

The work automobile comes, via the French automobile from the Ancient Greek word αυτς (autos," self") and the Latin mobiles ("movable"), meaning a vehicle that moves itself rather than being pulled or pushed by a separate animal or another vehicle. The alternative name car is believed to originate from the latin word carrus or car rum ("wheeled vehicle"), or the middle English word carre ("cart") (from old north French), or karros (a Gallic wagon)[5-6]. An automobile, used for transporting passengers, which also carries its own engine or motor. Most definitions of the term specify that automobiles are designed to run primarily on roads, to have seating for one to eight people, to typically have four wheels, and to be constructed principally for the transport of people rather than goods[1]. However, the term automobile is far from precise, because there are many types of vehicles that do similar tasks, there are approximately 600 million passenger cars worldwide (roughly one car per eleven people)[2-3]. Around the world, there were about 806 million cars and light trucks on the road in 2007: they burn over 260 billion gallons of gasoline and diesel fuel yearly. The numbers are increasing rapidly, especially in china and India[4].

History

Ferdinand verbiest, a member of a Jesuit mission in china. Built the first steam – powered vehicle around 1672 which was of small scale and designed as a toy for the Chinese emperor, that was unable to carry a driver or a passenger, but quite possible was the first working steam – powered vehicle ('automobile')[7-8]. Although Nicolas – Joseph Cugnot is often credited with building the first self – propelled mechanical vehicle or automobile in about 1769, by adapting an existing horse – drawn vehicle this claim is disputed by some [citation needed], who doubt Cugnot's three wheeler ever ran or was stable. What is not in doubt is that Richard Trevithick built and demonstrated his puffing devil road locomotive in 1801, believed by many to be the first demonstration of a steam – powered road vehicle, although it was unable to maintain sufficient steam pressure for long periods, and would have been of little practical use.

In Russia, in the 1780s. Ivan Kulibin developed a human – pedaled, three – wheeled carriage with modern features such as a flywheel, brake gear box, and bearing : however it was not developed further[9], Francois Isaac de Rivaz, a Swiss inventor, designed the first internal combustion engine in 1806, which was fuelled by a mixture of hydrogen and oxygen and used it to develop the worlds first vehicle. Albeit rudimentary. To be powered by such an engine. The design was not very successful, as was the case with others, such as Samuel Brown, Samuel morey, and Etienne Lenoir with his hippo mobile, who each produced vehicles

(usually adapted carriages or carts) powered by clumsy internal combustion engines[10]. In November 1881, French inventor Gustave Trouve demonstrated a working three – wheeled automobile that was powered by electricity. This was at the international exhibition of electricity in Paris[11]. Although several other German engineers (including Gottlieb Daimler, Wilhelm May Bach, and Siegfried Marcus) were working on the problem at about the same time, Karl Benz generally is acknowledge as the inventor of the modern automobile[10]. an automobile powered by his own four – stroke cycle gasoline engine was built in Mannheim, Germany by Karl Benz in 1885, and granted a patent in January of the following year under auspices of his major company, Benz & Cie., which was founded in 1883.

It was an integral design, without the adaptation other existing component's and included several new technological elements to create a new concept. This is what made it worthy of a patent. He began to sell his production vehicles in 1888. In 1879, Benz was granted a patent for his first engine, which had been designed in 1878. Many of his other inventions made the use of the internal combustion engine feasible for powering a vehicle. His first motor wagon was built in 1885, and he was awarded the patent for its invention as of his application on January 29, 1886, Benz began promotion of the vehicle on July 3, 1886 and 1893, when his first four wheeler was introduced along with a model intended for affordability. They also were powered with four-stroke engines of his own design, Emile roger of France, already producing Benz engines under license, now added the Benz automobile to his line of products. Because France was more open to the early automobiles, initially more were built and sold in France through roger Benz sold in Germany.

In 1896, Benz designed and patented the first internal – combustion flat engine, called a boxer motor in German. During the last years of the nineteenth century. Benz was the largest automobile company in the world with 572units produced in 1899 and , because of its size Benz & Cie, became a joint – stock company, Daimler and may Bach founded Daimler motoren Gesellschaft (Daimler motor company,) DMG) in Connstatt in 1890, and under the brand name, Daimler sold their first automobile in 1892, which was a horse – drawn stagecoach built by another manufacturer, that they retrofitted with an engine of their design, By 1895 about 30 vehicles had been built by Daimler and may Bach, either at the Daimler works or in the hotel Hermann, where they set up shop after disputes with their backers. Benz and the may Bach and the Daimler team seem to have been unaware of each other's early work.

They never worked together because, by the time of the merger of the two companies. Daimler and may Bach were no longer part of DMG. Daimler died in 1990 and later that year, May Bach designed an engine named Daimler – Mercedes that was placed in a specially – ordered model built to specifications set by Emil Jellinek. This was a production of a small his country. Two years later, in 1902, a new model DMG automobile was produced and the model was named Mercedes after the maybach engine which generated 35 hp.

May Bach quit DMG shortly there after and opened a business of his own. Rights to the Daimler brand name were sold to other manufactures. Karl Benz proposed co –operation between DMG and Benz & Cie when economic conditions began to deteriorate in Germany following the First World War, but the directors of DMG refused to consider it initially. Negotiations between the two companies resumed several in 1924 they singed an agreement of mutual interest, valid until the year 2000. both enterprises standardized design, production purchasing and sales and they advertised or marketed their automobile models jointly, although keeping their respective brands.

Production

The large – scale production – line manufacturing of affordable automobiles was debuted by Ransom Olds at his Oldsmobile factory in 1902. This concept was greatly expanded by Henry Ford, beginning in 1914. As a result ford's cars came off the line in fifteen minute intervals, much faster than previous methods, increasing productivity eightfold (requiring 12.5 man-hours before, 1 hours 33 minutes after,) while using less manpower[4] it was so successful paint became a bottleneck.

Only Japan black would dry fast enough, forcing the company to drop the variety of colors available before 1914, until fast – drying duco lacquer was developed in 1926. This is source of ford's apocryphal remark, "any color as long as its black" [14] in 1914, an assembly line worker could by a model T with four months pay[14]. On June 28, 1926,Benz & Cie. And DMG finally emerged as the Daimler – Benz company, baptizing all of its automobiles Mercedes Benz, as a brand honouring the most important model of the DMG automobile the May Bach design later referred to as the 1902 Mercedes – 35 hp, along with the Benz name.

Karl Benz remained a member of the board of directors, of Daimler – Benz until his death in 1929 and at times, his two sons participated in the management of the company as well. In 1890. Emile Levassor and Armand Peugeot of France began producing vehicles with Daimler engines and so laid the foundation of the automobile industry in France. The first design for an American automobile with a gasoline internal combustion engine was drawn in 1877 by George Selden of Rochester, New York who applied for a patent for an automobile in 1879, but the patent application expired because the vehicle was never built. After a delay of sixteen years and series of attachments to his application, on November 5,1895,Selden was granted a united states patent (U.S. paten 549,160) for a two – stroke automobile engine, which hindered, more than encouraged, development of automobiles in the united states.

His patent was challenged by Henry ford and others, and overturned in 1911. in Britain, there had been several attempts to build steam cars with varying degrees of success, with Thomas Rickett even attempting a production run in 1860. [2] Santler from Malvern is recognized by the Veteran Car Club of Great Britain as having made the first petrol – powered car in the county in 1894 [3] followed by Frederick William LAN Chester in 1895, but these were both one – offs[13]. The first production vehicles in Great – Britain came from the Daimler motor company, a company founded by Harry, J. Lawson's in 1869, after purchasing the right to use the name of the engines, Lawson's company made its first automobile in 1897, and they bore the name Daimler[13]. In 1892, German engineer Rudolf Diesel was granted a patent for a "New Rational Combustion Engine" in 1897, he built the first diesel engine[10]. Steam – electric – and gasoline – powered vehicles competed for decades with gasoline internal combustion engines achieving dominance in the 1910s. Although various pistonless rotary engine designs have attempted to complete with the conventional piston and crankshaft design, only Mazda's version of the Wankel engine has had more than very limited success.

Ford's complex safety procedures – especially assigning each worker to a specific location instead of allowing them to roam about – dramatically reduced the rate of injury. The combination of high wages and high efficiency is called "Fordism," and was copied by most major industries. The efficiency gains from the assembly line also coincided with the economic rise of the United States. The assembly line forced workers to work at a certain pace with very repetitive motions which led to more output per worker while other countries were using less productive methods.

In the automotive industry, its success was dominating and quickly spread worldwide seeing the founding of Ford France and Ford Britain in 1911, ford Denmark 1923 Ford Germany 1925, in 1921 Citroen was the first native European manufacturer to adopt the production method. Soon, companies had to have assembly lines, or risk going broke by 1930,250 companies which is disappeared [14] Development of automotive technology was rapid, due in part to the hundreds of small manufacturers competing to gain the world's attention. Key developments included electric ignition and the electric self – starter (both by Charles Kettering, for the Cadillac motor company in 1910-1911), independent suspension, and four – wheel brakes. Since the 1920s. nearly all cars have been mass – produced to meet marked needs, so marketing plans often have heavily influenced automobile design.

It was Alfred P.Sloan who established the idea of different makes of cars produced by one company, so buyers could move up as their fortunes improved. Reflecting the rapid pace of change makes shared parts with one another so larger production volume resulted in lower costs for each

price range. For example in the 1930s. LaSalles, sold by Cadillac, used cheaper mechanical parts made by Oldsmobile, in the 1950s Chevrolet shared hood, doors, roof, and windows, with Pontiac, by the 1990s corporate drive trains and shared plafforms (with interchangeable brakes, suspension and other parts) were common. Even so, only major makers could afford high costs, and even companies with decades of production, such as Epperson, Cole, Dorris Haynes, or premier could not manage, of some two hundred American car makers in existence in 1920, only 43 survived in 1930, and with the Great Depression by 1940, only 17 of those were left.

In Europe much the same would happen, Morris set up its production line at Cowley in 1924, and soon outsold Ford, while beginning in 1923 to follow Ford's practise of vertical integration buying Hotchkiss (engines), Wrigley (gearboxes), and Osberton (radiators), for instance, as well as 41% of total British car production, Most British small – car assemblers, from abbey to extra had gone under, Citroen did the same in France coming to cars in 1919, between them and other cheap cars in reply such as Renault's 10cv and Peugeot's 5cv they produced 550,000 cars in 1925, and Mors, Hurt, and others could not compete[14]. Germany's first mass – manufactured car, the Opel 4ps laubfrosch (Tree Frog), came off the line at Russelsheim in 1924, soon making Opel top car builder in Germany, with 37% of the market[14].

Fuelf and propulsion technologies

Most automobiles in use today are propelled by gasoline (also known s petrol) or diesel internal combustion engines. Which are known to cause air pollution and are also blamed for contributing to climate change and global warming[15]. Increasing costs of oil – based fuels, tightening environment laws and restrictions on green house gas emissions are propelling work on alternative power systems for automobile. Efforts to improve or replace existing technologies include the development of hybrid vehicles. And electric and hydrogen vehicles which do not release pollution into the air.

Petrolem fuels diesel

Diesel- engine cars have long been popular in Europe with the first models being introduce as early as 1992[16] by Peugeot and the first production car, Mercedes – Benz 260 D in 1936 by Mercedes – Benz. The man benefit of diesel engines is a 50% fuel burn efficiency compared with 27% [17] in the best gasoline engines. A down – side of the diesel engine is that better filters are required to reduce the presence in the exhaust gases of fine soot particulates called diesel particulate matter Manufactures are now starting to fit [when?] diesel particulate filters to remove the soot. Many diesel – powered cars can run with little or no modifications on 100% bio diesel and combinations of other organic oils.

Gasoline

Engine have the advantage over diesel in being lighter and able to work at higher rotational speeds and they are the usual choice for fitting in high – performance sports cars. Continuous development of gasoline engines for over a hundred years has produced improvement in efficiency and reduced pollution.

The carburetor was used on early all road car engines until the 1980s but it was long realized better control of the fuel/air mixture could b achieved with fuel injection. Indirect fuel injection was first used in aircraft engines from 1909, in racing car engines from the 1930s and road cars from the late 1950s [17] Gasoline Direct Injection (GDI) is now starting to appear in production vehicles such as the 2007 (Marks II)BMW Mini. Exhaust gases are also cleaned up by fitting a catalytic converter into the exhaust system. Clean air legislation in many of the car industries most important a market has made both catalysts and fuel injection virtually universal fittings. Most modern gasoline engines also are capable of running with up to 15% ethanol mixed into the gasoline – older vehicles may have seals and hoses that can be harmed by ethanol.

With a small amount of redesign, gasoline – powered vehicles can run on ethanol concentrations as high as 85% 100% ethanol is used in some parts of the world (such as Brazil) but vehicles must be started on pure gasoline and switched over to ethanol once the engine is running. Most gasoline engine cars can also run on LPG with the addition of an LPG tank for fuel storage

and carburetor modifications to add an LPG mixer. LPG produces fewer toxic emissions and is a popular fuel for fork – lift trucks that have to operate inside buildings.

Biofuels

Ethanol, other alcohol fuels (biobutanol) and bio gasoline have widespread use as an automotive fuel. Most alcohols have less energy per liter gasoline and are usually blended with gasoline. Alcohols are used for a variety of reasons to increase octane, on improve emissions, and as an alternative to petroleum based fuel, since they can be made from agricultural crops. Brazils ethanol program provides about 20% of the nations automotive fuel needs, as a result of the mandatory use of E25 blend of gasoline throughout the country, 3 million dual or flexible – fuel vehicles sold since 2003 [18] that run on any mix of et Zhanol and gasoline. The commercial success of "Flex" vehicles, as they are popularly known, have allowed sugarcane based ethanol fuel to achieve a 50% market share of the gasoline marked by April 2008 [19-20,21].

Electric

Electric the first electric cars were built around 1832, well before internal combustion powered cars appeared. [22] for a period of time electrics were considered superior due to the silent nature of electric motors compared to the very loud noise of the gasoline engine. This advantage was removed with Hiram Percy Maxim's invention of the muffler in 1897. There after internal combustion powered cars had two critical advantages : (1 long range and 2) high specific energy (far lower weight of petrol fuel versus weight of batteries).

The building of battery electric vehicles that could rival internal combustion models had to wait for the introduction of modern semiconductor controls and improved batteries. Because they can deliver a high torque at low revolutions electric cars do not require such a complex drive train and transmission as internal combustion powered cars. Some post – 2000 electric car designs such as the venture fetish are able to accelerate from 0-60 mph (96 km/h) in 4.0 seconds with a top speed around 130 mph (210) others have a range of 250 miles (400 km) on the United States Environment Protection Agency (EPA) highway cycle requiring 3 – ½ hours to completely charge. [23] Equivalent fuel efficiency to internal combustion is not well defined but some press reports give it at around 135 miles per US gallon (1.74L/100Km: 162 mpg - imp).

Hydrogen

Hydrogen is a fuel that, upon consumption, does not emit any green house gases. Hydrogen can be burned in internal combustion engines as well as fuel cells.

Oxyhydrogen

Ox hydrogen is another fuel that can be used in existing internal combustion engines originally developed for using gasoline. This allows the engine to eliminate emissions although fuel

Table 1.

Deaths per billion journeys	Death per Billion hours	Death per billion kilometers
Bus : 4.3	Bus : 11.1	Bus : 0.4
Rail : 20	Rail : 30	Rail : 0.6
Van : 20	Van: 60	Van : 1.2
Car : 40	Car : 130	Car : 3.1
Foot : 40	Foot : 220	Foot : 54.2
Water : 90	Water : 50	Water : 2.6
Bicycle : 170	Bicycle : 550	Bicycle : 44.6
Air : 117	Air : 30.8	Air : 0.5
Motorcycle : 1640	Motorcycle : 4840	Motorcycle : 108.9

Table 2.

Rank	Country/Region	2008[2]	2005	2000
-	World	70,526,531	66,482,439	58,374,162
-	European Union	18,432,070[15]	18,176,860[16]	17,142,142[17]
1	Japan	11,563,629	10,799,659	10,140,796
2	China	9,345,101	5,708,659	2,069,069
3	United States	8,705,239	11,946,653	12,799,857
4	German	6,040,582	5,757,710	5,526,615
5	South Korea	3,806,582	3,699,350	3,114,998
6	Brazil	3,220,475	2,530,840	1,681,517
7	France	2,568,978	3,549,008	3,348,361
8	Spain	2,541,644	2,752,500	3,032,874
9	India	2,314,662	1,638,674	801,360
10	Mexico	2,191,230	1,684,238	1,935,527
11	Canada	2,077,301	2,687,892	2,961,636
12	Russia	1,790,301	1,354,504	1,205,581
13	United Kingdom	1,649,515	1,803,109	1,813,894
14	Thailand	1,393,742	1,122,712	411,721
15	Turkey	1,147,110	879,452	403,947
16	Iran	1,051,430	817,200	277,985
17	Italy	1,023,774	1,038,352	1,738,315
18	Poland	950,908	613,200	504,972
19	Czech Republic	945,822	602,237	455,492
20	Belguim	724,498	926,528	1,033,294
21	Indonesia	600,844	500,710	292,710
22	Argentina	597,086	319,755	339,632
23	Slovakia	575,776	218,349	181,783
24	South Africa	562,965	525,227	357,364
25	Malaysia	530,810	563,408	282,830
26	Ukraine	423,127	215,759	31,255
27	Hungary	346,055	152,015	137,398
28	Australia	329,556	394,713	374,122
29	Sweden	309,034	339,229	301,343
30	Romani	245,034	194,802	78,165
31	Uzbekistan	208,038	94,437	52,264
32	Slovenia	197,843	187,247	98,953
33	Taiwan	182,969	446,345	372,613
34	Portugal	175,155	226,834	245,784
35	Austria	150,877	253,279	141,026
36	Venezuela	135,042	135,425	123,324
37	Netherlads	132,494	102,204	98,823
38	Pakistan	130,857	153,393	102,578
39	Egypt	114,782	123,425	78,852
40	Philippines	54,434	64,492	38,877
41	Moroco	41,731	33,992	31,314
42	Colombia	38,327	75.539	87,342
43	Vitenam	33,418	31,600[8]	6,862[9]
44	Ecuador	29,322	32,254	41,047
45	Belarus	28,511	26,995	19,324
46	Finland	18,376	21,644	38,296
47	Serbia	11,628[8]	14,179	12,740[9]
48	Chile	4,405	6,660[8]	5,245[9]
49	Nigeria	2,040[8]	2,937[8]	7,834[9]
50	Zimbabwe	1,345	960	792
51	Kenya	1,080	405	288[9]

This is a list of the top ten centuries for total number of motor vehicles owned

efficiency is reduced rather than improved (since the energy required to spilt water exceeds the energy recouped by burning it).

Steam

Steam power, usually using an oil – or gas – heated boiler, was also in use until the 1930s but had the major disadvantage of being unable to power the car until boiler pressure was available (although the newer models could achieve this in well under a minute). It has the advantage of being able to produce very low emissions as the combustion process can be carefully controlled. Its advantage include poor heat efficiency and extensive requirement for electric auxiliaries[24].

Rocked and jet cars

A rocket car holds the record in drag racing. However the fastest of those cars are used to se the land speed record, and are propelled by propulsive jets emitted from rocket, turbojet or more recently and most successfully turbofan engines. The thrust SSC car using two Rolls – Royce Spay turbofans with reheat was able to exceed the speed of sound at ground level in 1997.

Data safety

There are three main statistics to which automobile safety can be compared[25]: (Data relates to transport in the UK only). While road traffic injuries represent the leading cause in world wide injury – related deaths[26], their popularity undermines this statistic. Mary ward became one of the first documented automobile fatalities in 1869 in Parsons town, Ireland[27] and Henry Bliss one of the United States first pedestrian automobile casualties in 1899 in New York[28]. There are now standard tests for safety in new automobiles. Like the Euro NCAP and the US NCAP tests[29]. As well as insurance – backed IIHS tests [30].

List countries by motor vehicle procution

This is a list of countries by motor vehicle production based on OICA accessed in June 2009 Figures are including passenger cars light commercial vehicles, minibuses, trucks, buses and coaches[1].

Noise pollution

Noise pollution (or environment noise) is displeasing human – animal – or machine – created sound that disrupts the activity or balance of human or animal life. The word noise comes from the Latin word nausea meaning seasickness. The source of most outdoor noise world side is transportation systems including motor vehicle noise, aircraft noise and rail noise. [1,2] Poor urban planning may give rise to noise pollution since side – by – side industrial and residential buildings can result in noise pollution in the residential area. Other sources of indoor and outdoor noise pollution are car alarms, emergency service sirens, office equipment factory machinery, construction work, ground keeping equipments barking dogs, appliances, power tools, lighting hum, audio entertainment system, loudspeakers, and noisy people.

Impact of noise pollution in the UK

Figure complied by rockwood, the mineral wool insulation manufacturer, based on responses from local authrities to a freedom of information Act (FOI) request reveal in the period,April 2008 – 2009 UK councils received 315,838 plaints about noise pollution from private residence.

This resulted in environment health officers across the UK serving, 8,069 noise abatement notices, or citations under the terms of the Anti – Social Behavior (Scotland) act. In the last 12 months, 524 confiscations of equipment have been authorized involving the removal of powerful speakers stereos, and televisions, Westminster city council has received more complaints per head of

Table 3.

Rank	Country	Total of motor vehicle owned
1.	United states	229,500,000
	European union	211,600,000
2.	China	176,000,000
3.	Japan	68,900,000
4.	Germany	44,804,760
5.	Italy	34,048,983
6.	France	31,951,079
7.	Russia	27,700,000
8.	United kingdom	26,034,225
9.	Brazil	25,200,000
10.	Spain	21,977,778

population than any other district in the UK with 9,814 grievances about noise, which equates to 42.32 complaints per thousands residents, Eight of the top 10 councils ranked by complaints per 1,000 residents are located in London[16].

Driverless cars

Fully autonomous vehicles, also known as robotic cars, or driverless cars, already exist in prototype, and are expected to be commercially available around 2020.

According to urban designer and futurist Michael E.Arth. driverless electric vehicles – in conjunction with the increased use of virtual reality for work, travel, and pleasure – could reduce the world 's 8000,000,000 vehicles to a fraction of that number within a few decades[39]. This would possible if almost all private cars requiring drivers which are not in use and parked 90% of the time. Would be traded for public self – driving taxis that would be in near constant use. This would also allow for getting the appropriate vehicle for the particular need – a bus could come for a special night out, and a segway could come for a short trip down the street for one person. Children could be chauffeured in supervised safety. DUIs would no longer exist, and 41,000 lives could be saved each year in the U.S. alone.[40,41].

Future car technologies

Automobile propulsion technology under development includes gasoline/electric and plug – in hybrids battery electric vehicles, hydrogen cars, biofuels, and various alternative fuels, Research into future alternative forms of power include the development of fuel cells, Homogeneous charge compression ignition (HCCI), Stirling engines[42] and even using the stored energy of compressed air or liquid nitrogen. New materials which may replace steel car bodies include duralumin, fiberglass, carbonfiber and carbon annotates. Telemetric technology is allowing more and more people to share cars, on a pay – as – you – go basis, through such schemes as city car club in the UK. Mobility in mainland Europe and Zip car in the US.

Conclusion

In recent year, along with the rapid increasing automobile – requirement the reconstruction of world Automobile technology is more and more urgent. There will be huge demand for transportation to improve the efficiency and stability of automobile this paper introduces automobile technologies and give description of its development in the world.

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