Influential Cars of the 20th Century

Jim Rauf
Significant Cars of the 20\textsuperscript{th} Century

- **1917 Packard** employs about 1000 black workers
  - More than other car manufacturers
- **1918 GM** creates **GMAC** to provide financing for car purchases
- **1919 Citroen** of France founds a company to mass produce cars on an assembly line-first in Europe
- **1920** U.S. recession—many car companies collapse
  - **Ford** and **GM** narrowly avoid bankruptcy
- **Duesenberg** offers first hydraulic brakes designed by Malcom Loughead on its
- World car production is 2.4 million cars
- U.S. production is 2.3 million cars
- **1921** U.S. Federal Highway Act
- “First drive in restaurant” **Royce Halley’s “Pig Stand”** opens in Dallas Texas
Significant Cars of the 20th Century

- **1922** Renault in France installs an assembly line
- **Country Club Plaza** - first shopping mall opens in Kansas City, Missouri
- **1923** Ethyl Gasoline goes on sale
- **Charles Kettering** and **Thomas Midgley** discovered (1922) that adding **Tetraethyllead** additive to gasoline increases its anti knock properties
  - Allowing for higher compression ratio engines
- **John Hertz** opens **Drive UR Self System** in Chicago, Illinois
- Auto industry consolidation
  - More than 100 car manufacturers in U.S.
  - Top 10 account for 90% of sales
Influential cars of the 20th Century – 1923 Supercharged Mercedes

- **1923 Mercedes 6/25/40 hp** was the first supercharged road car
- A supercharger increases the pressure and density of air supplied to an internal combustion engine
- This gives each intake cycle of the engine more oxygen, letting it burn more fuel and do more work, thus increasing the power output
- Supercharger can be driven mechanically by a belt, shaft, or chain connected to the engine's crankshaft
- The other supercharged cars at this time were almost all racing cars
- Since then, superchargers and later turbochargers have been used on production cars

Mercedes 6/25 hp, from 1924: 6/25/38 hp
Significant Cars of the 20th Century Chrysler (Maxwell) High Compression Engine

• **1924** — One year before *Chrysler Corporation* was created first Chrysler launched by *Maxwell Motors*

• These cars had a new **high-compression** six-cylinder, a seven-bearing crankshaft, carburetor air cleaner, replaceable oil filter, and **four-wheel hydraulic brakes**

• Features like this had never before been offered in a medium-priced car

• Company sold a record 32,000 cars in its first-year

• In **1926, Chrysler** Introduces the *Chrysler 70* with innovative rubber engine and spring mounts

• *It was named for its ability to hit 70 MPH*
Significant cars of the 20th Century 1924 Balloon Tires

- **1924 Hudson** and **Essex** offer standard balloon tires
- Balloon tires operate with low internal air pressure
- This allows increased contact area with the road
- The **Benz** car of 1888 used pneumatic rubber tires essentially bicycle tires
Influential Cars of the 20th Century

• **1924 Bugatti Type 35** used *cast aluminum wheels*

• They incorporated an integrally-cast brake drum

• In addition to weight saving over a conventional wheel and separate brake drum, they acted as large heat sinks to provide improved brake cooling
• **1925 Model T Roadster with Pickup Body** was created when Ford saw that many farmers were either modifying their Model T automobiles for work in their fields.

• Coachbuilders and Ford dealers alike had been offering pickup bodies for years before the factory began offering them.

• **Ford** sold around 135,000 Model T pickups.

• This was the beginning of the American love of pick up trucks.

• Putting untold numbers of horses out of work.

• The **Milestone Motel** in San Luis Obispo, California was the first to call itself a "Motel" (motor-hotel) it was designed to cater to the automobile traveler.
Influential Cars of the 20th Century  Safety Glass

- **1926** laminated safety glass was introduced in by **Rickenbacker** as a standard feature all around the car
- **Ford** began using safety glass in 1927
- Before that, standard glass had been used, but was very dangerous in the event of a crash
- Tempered glass began to take over for the side and rear windows starting in the 1930s because it was cheaper than laminated
Significant Cars of the 20th Century- 1926 Daimler Benz Formed

- **1926** In Germany Daimler and Benz companies merge to form Daimler Benz AG
- The automobile industry is the largest in the U.S.
- Its supplier industries are booming
  - Glass, rubber, steel, oil, etc
- **1927** GM forms the “Art and Color Section” to improve the style of its cars
- **Ford** ends production of its Model T after producing more than 15,000,000 cars
- Other manufacturers’ cars better satisfied customers’ requirements/desires
Significant Cars of the 20th Century- 1927 Chevrolet

• **1927 Chevrolet Series AA Capitol** was introduced
  
• It had an overhead valve four cylinder engine, three speed manual transmission an accelerator pedal (replacing a throttle on the steering column), a gas gauge in the dashboard and a centrally installed rear view mirror

• The **GM** introduced their **A Platform** which was used on several of their makes which shared common appearance

• **GM** also introduced yearly appearance changes while using a corporate appearance from the Harley Earl led **Art and Color Section**

• **Chevrolet, Oakland, Oldsmobile, Buick** and **Cadillac** shared similar appearances

• All their bodies were made by **Fisher Body** which GM had bought in 1918

• Engines and radiator badging were unique to the several makes

*Chevrolet outsells Ford* - sales of over 1 million cars
Influential Cars of the 20th Century  1928 Power Brakes

• **1928 Pierce-Arrow** was the first production car to come with a vacuum-operated power booster for brakes, the Bragg-Kliesrath

• The intake manifold supplied the vacuum needed to reduce the amount of effort required to apply the brakes

• By the early 1930s, **Lincoln, Cadillac, Duesenberg, Stutz, and Mercedes** were also including vacuum-assisted drum brakes

• Drum brakes remained standard, however, because they worked well and were cheaper to manufacture than disk brakes

• Beginning in the 1940s other power-assist systems began to appear, and by the 1950's power brakes were common
Influential Cars of the 20th Century  1928 Ford Model A

• **1928 Ford Model A** was first produced in 1927, and introduced December 2, 1927 (as a 1928)

• Body styles ran from the Tudor at US$500 (in grey, green, or black) to the town car with a dual cowl at US$1,200 (nine body styles were available)

• It featured a side valve four cylinder engine and a three speed transmission and an accelerator pedal

• **Model A** production ended in March 1932, after 4,858,644 had been made

• Length 155.2 inches

• Wheelbase 103.5 inches

• Track is 56 inches

  Weight 2,050 to 2,386 pounds
Influential Cars of the 20th Century  1928 Ford Model A

- A water pump, an oil pump and hydraulic shock absorbers are added
- A modern 3-speed non synchronized gear box is used
- The carburetor is gravity fed, the gas tank is immediately behind the instrument panel
- Brakes are now on all 4 wheels and actuated by steel rods
- The 4 cylinder engine displaces 200.5 cubic and produces 40 horsepower
- Compression ratio is a low 4:22 / 1 allowing use of low grade fuel
- Top speed of is 65 mph, cruising speed is 40-45 mph
- Longevity, dependability and simplicity were more important than performance
Influential Cars of the 20th Century 1931 Independent Suspension

- **1931 Mercedes 170**, a smaller car than usual due to effects of the depression, featured four wheel independent suspension
- The front, the wheels being suspended from two transverse leaf springs
- At the back there were two half swing-axles
- The suspension minimized unsprung mass and was subsequently introduced across the entire Mercedes-Benz range
- The **hydraulic brakes** operated on all four wheels
- An **ignition steering lock** was standard feature
Influential Cars of the 20th Century  1932 Single Cast Block V8

- **1932 Ford V8** engine block was cast in one piece
- The **monobloc casting** design for V-8 blocks had been done before, but not for mass production
- Most V engines of the time had multiple cylinder blocks bolted to a common crankcase (itself a separate casting)
- The foundry practice (e.g., workflows, materials handling) was a revolutionary advancement in the mass production of castings
- **Charles E. Sorensen** lived up to his longtime nickname at Ford, "Cast-Iron Charlie", by leading this revolution to bring Ford's first V8 to market
- Ford's patent on the mono bloc cast V8 ran out in 1949
- GM began producing **mono bloc cast** V8 engines
Influential Cars of the 20\textsuperscript{th} Century - Volkswagen Beetle

- In the early 1930s, the German auto industry was mostly limited to luxury models
- One German out of 50 owned a car
- The original concept behind the Volkswagen is the idea of a car affordable and practical enough for common people to own
- Hence the name Volkswagen "people's car" in German
- The Volkswagen Beetle has been credited mainly to Ferdinand Porsche and Adolf Hitler
- The idea of a "people's car" had existed since the mass-production of cars was introduced
- Béla Barényi was able to prove in court in 1953 that Porsche's patents were his ideas
- Barényi has since been credited with first conceiving the original design for this car in 1925

- 1931 Porsche designed a small car for the motorbike firm Zundapp
- It had a 5 cylinder radial water cooled rear mounted engine—it was a failure
Influential Cars of the 20th Century - Volkswagen Beetle

- **1933 Porsche** designed a small car for motorcycle firm **NSU** that used torsion bar suspension and an air cooled rear mounted engine.

- **January 1934 Porsche** submitted to the German Transport Ministry a proposal to design a car:
  - It should be an entirely serviceable car of normal dimensions.
  - It should be practical means of transportation.
  - A simple interchange of bodies should make it all purpose.
  - It should be as fool proof as possible.
  - With all forms of maintenance reduced to a practical.

- **June 1934 Porsche’s** proposal was accepted, and he began design and development of what would become the **Volkswagen Type 1 or VW Beetle**.

- The first experimental prototypes were ready in **February 1936**.
Influential Cars of the 20th Century Volkswagen Beetle

- Each prototype was subjected to a 30,000 mile test program – unheard of in the mid 1930s
- **1937** a much modified VW design was completed
- Traditional German auto manufacturers were not interested in manufacturing small cars
  - Small cars = small profits
- **Porsche** visited U.S. auto manufacturers to observe mass production methods
- **May 1937** the German government set up a company in Berlin **GEZUVOR**, renamed **Volkswagenwerk GmbH** in **1938**
- It was tasked to build a plant and manufacture the cars
- The cornerstone for the **Fallersleben** plant (50 miles East of Hannover) was laid in May 1938
- **Fallersleben** was renamed **Wolfsburg** after WW II
- The Nazi regime offered a scheme to buy the new VW
- A coupon based savings plan in which Germans could order and pay for the car (sedan, with or without sunroof, and a convertible)
- The cars price was 900 RM
- Payments were to be 5 RM per week
  - About 3 ½ years of payments
- By the end of 1938 about 170,000 accounts had been opened
- The production car was very similar to post war production **VWs**
- War was declared **September 1939**
- Civilian **VW** production ceased immediately
  - About 210 cars were completed
Influential Cars of the 20th Century - Volkswagen Beetle

- The VW factory was converted to wartime production of military vehicles and cars for government officials
- About 630 cars
- About 52,000 Kubelwagens (bucket cars)
- About 14,000 Schwimmwagens
Influential Cars of the 20th Century - Volkswagen Beetle

- Mass production of civilian VW cars did not start until post-war occupation
- The Volkswagen factory was handed over by the Americans to British control in 1945
- The plan was to dismantle and shipped it to Britain
- No British car manufacturer was interested in the factory
- An official report included the phrases "the vehicle does not meet the fundamental technical requirement of a motor-car... it is quite unattractive to the average buyer... To build the car commercially would be a completely uneconomic enterprise."
- The factory survived by producing cars for the British Army instead

The first VW Beetle in the U.S. was in 1949
Influential Cars of the 20th Century  1938 Volkswagen Beetle
Influential Cars of the 20th Century Cars - Volkswagen Beetle
Influential Cars of the 20th Century - Volkswagen Beetle
Influential Cars of the 20\textsuperscript{th} Century Cars - Volkswagen Beetles in America

- The first VW Beetles were imported into U.S. in 1949
- They quickly dominated the American import car market over British, French and Italian makes
- Selling two cars in 1949 and peaking in 1968 at almost 400,000 cars in 1968
- VW’s superior dealer network and innovative advertising as well its reliability maintained its sales lead
- Worldwide the Volkswagenwerk produced over 21,500,000 + VW Beetles from 1938 thru 2003

The first Beetle to arrive in America in 1949
Influential Cars of the 20th Century - Volkswagen Beetle U.S. Advertising
Influential Cars of the 20th Century - Volkswagen Beetle
Influential Cars of the 20\textsuperscript{th} Century  VW Beetle
### Volkswagen Beetle 1960 Specs

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1960 Beetle Base Model tire size **165/80R15** tire
Influential Cars of the 20\textsuperscript{th} Century
Influential Cars of the 20th Century Cars - Volkswagen Beetle Suspension
Influential Cars of the 20th Century  VW Beetle Engine
In 1974, Wolfsburg builds its last Bug, as production shifts to other European facilities, as well as Puebla, Mexico.

VW plants world wide:
- Germany
  - Wolfsburg
  - Emden
  - Osnabruck
- Brazil
- Mexico
- Australia
- Nigeria

July 30, 2003, the last of 21,529,464 Volkswagen Beetles built since World War II rolls off the production line at Volkswagen’s plant in Puebla, Mexico.
Influential Cars of the 20th Century - Volkswagen Beetle – Variants and Aftermarket Vehicles
Influential Cars of the 20th Century - Volkswagen Beetle - Close Relative

Porsche 356
Influential Cars of the 20th Century - Volkswagen Beetle

• The Volkswagen Beetle sold over 20.5 million cars worldwide during its 65 year production run
• Its basic styling, configuration and design features were unchanged
• It played a part in the economic recovery of West Germany after World War II
• It provided inexpensive and reliable transportation for people around the world
• It was a major player in the rise of imported automobiles in the U.S.
• It, along with a few other import makes, forced GM, Ford and Chrysler to offer “compact” cars
• It served as the basis for the rise of the Porsche sports car and subsequent company
• While it did not “put the world on wheels” as the Ford Model T did, it was an

Influential Car of the 20th Century