

# Influential Cars of the 20 th Century IV

Jim Rauf

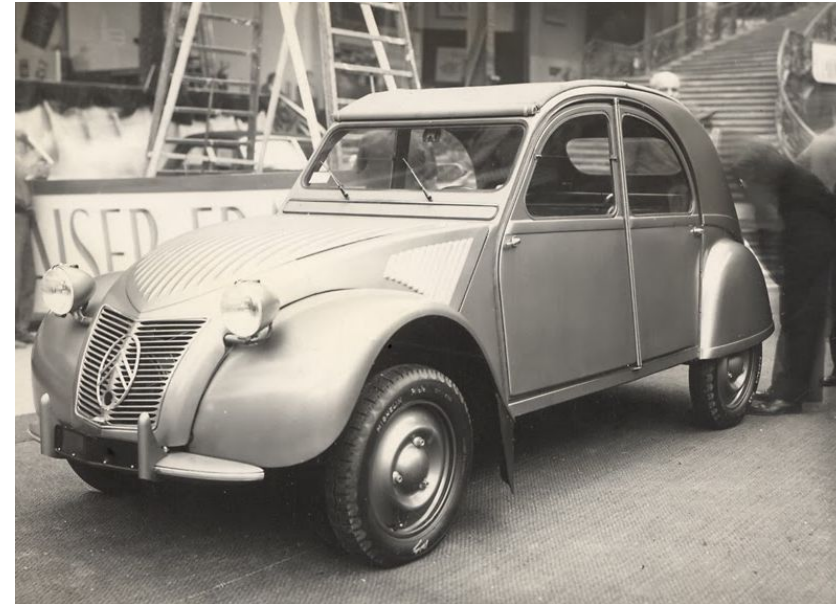
# Influential Cars of the 20 th Century

- **1942** All car production in the U.S. ends
- Industry transition to military production
- **1945** U.S. manufacturers resume civilian car production-pre war models
- **Crosley** announces intent to produce a small car with a four cylinder engine after the war
- **Ralph Teeter** invents **cruise control**
- Formation of a new car company- **Kaiser - Frazer Corporation**
- **GM , Studebaker , Nash , Hudson** and **Packard** begin producing 1946 models
- Post WW II cars ( 1946) were “face lifted” 1942 models

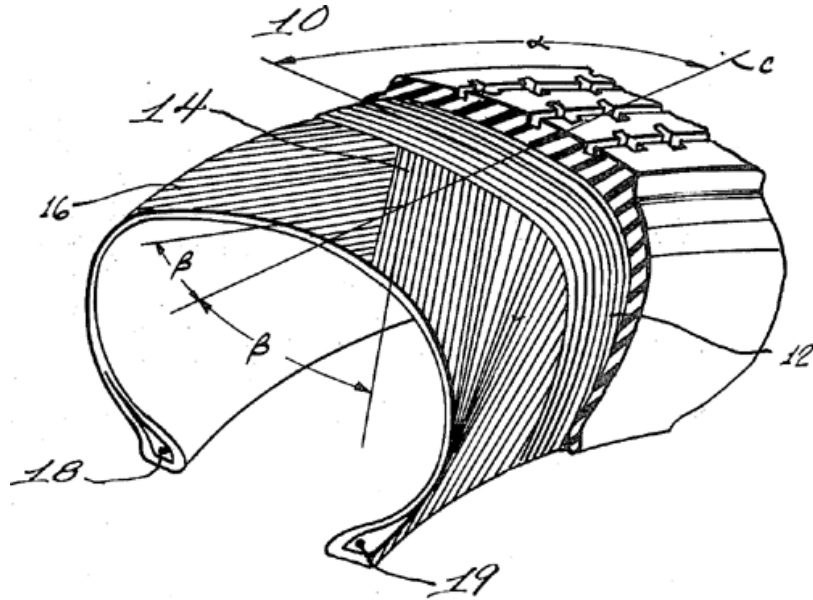


## Influential Cars of the 20 th Century Radial Tires

- **Michelin** in France designed, developed, patented, and commercialized the radial tire
- 1946 The first **Michelin X** radial tire for cars was developed in by Michelin researcher **Marius Mignol**
- **Michelin** owned the leading automaker **Citroën**, so it was quickly able to introduce its new design, including on the new **1948 Citroën 2CV** model
- In 1952, **Michelin** developed a radial truck tire
- Because of its significant advantages in durability and fuel economy , this technology spread quickly in Europe and Asia in the 1950s and 1960s
- 1970, **Ford Motor Company** produced the first American-made vehicle with radial tires as standard equipment, **Michelin** tires fitted to the **Continental Mark III**



## Influential Cars of the 20 th Century Radial Tires



- The advantages of radial tires over bias ply:
- Flexible sidewalls
- Reduced fuel consumption due to less rolling resistance
- A softer ride because of the layout of the tire's plies and because of the flex of the sidewalls. This assumes equivalent profiles between the two tires (also, as stated above, at lower speeds radial-ply tires will react more harshly to ridges in the road such as expansion joints).
- More stable contact with the road surface.
- Steel Belted – Results in tougher overall construction
- Longer Tread Life
- Wider Footprint
- Less ground compaction and damage
- Reduction in tire replacement due to less heat generated by the tire
- Reduced machine maintenance costs.

# Influential Cars of the 20 th Century

- 1946 **Kaiser** and **Frazer** begin offering new passenger car models
  - They are not “face lifted” pre- war 1942 models
- **Preston Tucker** forms a company to produce his radical new passenger car the **Tucker**
  - It has an air cooled , rear mounted engine
  - It offers padded interior surfaces
  - Center head light that turns with the steering wheel
  - A perimeter frame for crash protection
  - A roll bar integrated into the roof

## Engine

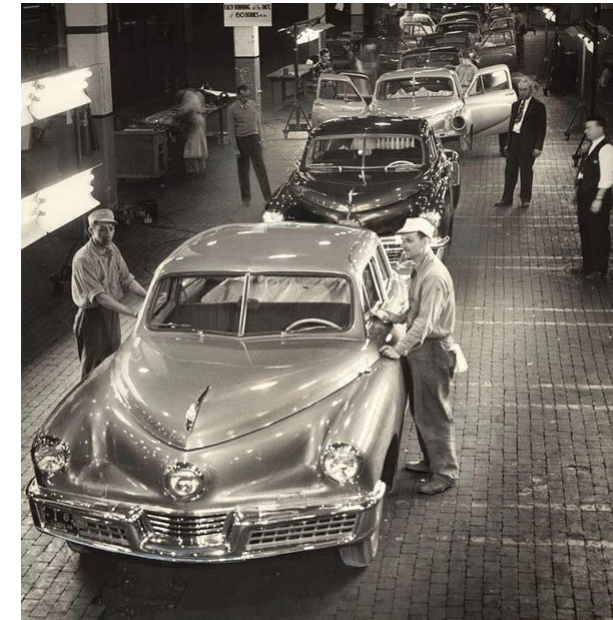
horizontally opposed 6 cylinder  
OHV, 334.1 cubic inches (5.475 L)  
7.0:1 compression ratio  
166 bhp  
372 lb-ft torque

Dimensions	
Wheelbase	128.0 in
Length	219.0 in
Width	79.0 in
Height	60.0 in
Curb weight	4,200 lb



# Influential Cars of the 20 th Century

- **1947 Ford** creates an automation department-the first in the industry
- **Willys Overland** introduces all steel **Jeep** station wagon
- 1948 **Goodrich** introduces tubeless tires
- **1948 Buick** offers a new type of automatic transmission the “**Dyna Flow**”
- **Cadillac** passes **Packard** as the main U.S. luxury brand
- **Preston Tucker** builds 51 examples of his radical new car design
- **Goodyear** company introduces tubeless tires



# Influential Cars of the 20 th Century

- **1949** The first **VW Beetle** arrives in the U.S.
- **Nash** introduces its “**Airflyte** “ an aerodynamic styling developed in a wind tunnel
- **Chrysler Crown Imperial** offers disk brakes-first in U.S. by major manufacturer
- **Cadillac** releases its new high compression **overhead valve (OHV) V8 engine**
  - It uses the **monobloc** cast engine block design that had been patented by **Ford** in 1932
  - It is the industry’s first mass production OHV V8
  - It uses hydraulic valve lifters
  - **Ford, Mercury** and **Lincoln** continue with the side valve or “**flat head**” V8s
  - **Chrysler** still producing **straight eight** engines
- **Chrysler** introduces the ignition key starter switch<sup>jR1</sup>



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**jR1**

james Rauf, 5/18/2021

# Influential Cars of the 20 th Century

- 1949 The first mass-production of “pillarless hardtops” began by General Motors
- Two-door, pillarless hardtops were offered by **Buick**, **Oldsmobile** and **Cadillac**
  - **Chevrolet** added the style in 1950
- The hardtop had the “look of a convertible” but with a steel top instead of a cloth top
  - They were two door bodies
- Lack of a center pillar required additional strengthening of the cars’ structure
- Other manufacturers followed GM’s styling lead



# Influential Cars of the 20 th Century

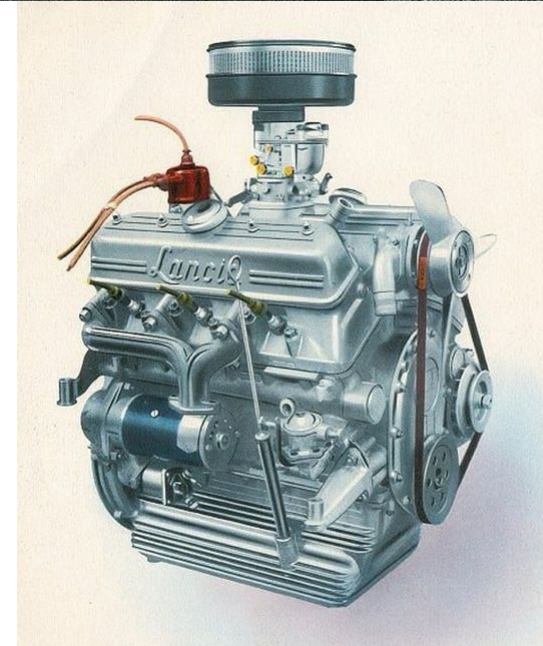
- **1950 Nash** releases the **Rambler**
- The first “compact car” length 176 inch
  - Chevrolet Deluxe length 197 inch
- It came only in a convertible body
- Its base price of \$1808 was slightly lower than the base convertible models from its intended competition
- Its standard equipment included : whitewall tires, full wheel covers, electric clock, and pushbutton AM radio
  - Extra cost options on other cars in 1950
- Its small 6 cylinder engine offered impressive gas mileage
- Production was 9,330 cars in its first year



Body Styles	2-door convertible
	2-door hardtop
	2-door sedan
	2-door station wagon
	2-door sedan delivery
Engine	172.6 cu in (2.8 L) I6
Wheelbase	100 in (2,540 mm)
Length	176 in (4,470 mm)
Height	59.75 in (1,518 mm)
Curb weight	Approx. 2500 lbs

# Influential Cars of the 20 th Century

- **Ford** passes **Chrysler** to become number two in sales in U.S.-**GM** remains number one
- **Lancia** introduced one of the world's first production V6 engine in the **Lancia Aurelia**
- It had a vee angle of 60 degrees and 75 hp
- It remained in production through 1970
- **Japanese** auto manufacturers produce ~2000 cars
- **Ford** releases its new automatic transmission for 1951 models-design by Borg Warner
  - **Studebaker** also contracts with B-W for automatic transmission
- Nearly all manufacturers offer automatic transmissions on their 1950 models
- **Goodrich** offers puncture sealing tubeless tires



# Influential Cars of the 20 th Century

- **1951 GM** shows a **Harley Earl** styled **concept car** the **LeSabre** featuring
  - Heated seats
  - Rain sensor to raise the top
- The **first power** steering on a production car is from **Chrysler**
  - Power steering becomes common on larger cars throughout the industry
- **Ford's** first automatic transmission, the **Ford-O-Matic** appeared in 1951 models
- The basic unit was designed by **Borg-Warner**
- It became the platform for many later model automatic transmissions
- Developed as a three-speed automatic, it would normally be started in second gear



- The **LeSabre** was emulating fighter aircraft shapes

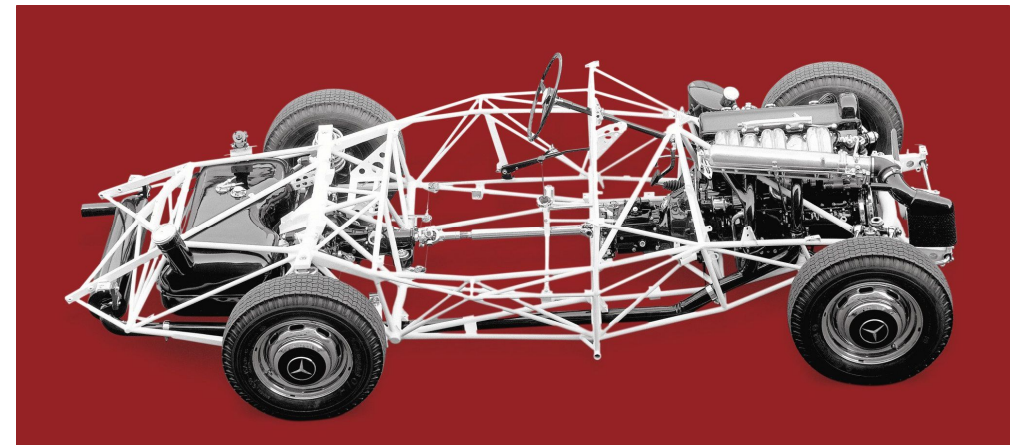
# Influential Cars of the 20 th Century

- **Ford** offers a hardtop model
  - **GM** is leading automobile styling
- **Ford** is still using its “flat head” V8 engines
- Power steering is offered by **Chrysler** and **Buick**
- **Sears Roebuck** introduces a 1952 **Allstate** car
  - It is a rebadged **Kaiser Frazer** manufactured **Henry J**
  - The **Allstate** was a small car
  - Power was from a 68 hp 4 cylinder engine or an 80 hp 6 cylinder engine
  - 178 in long
  - 100 in wheel base
  - 70 inches wide
  - **Sears** sold a total of 2,363 cars in the two years it was offered



# Influential Cars of the 20 th Century

- **1952** German **Blaupunkt** offers the first **FM** car radio
- The end of the **Crosley** car -General Tire Company buys **Crosley** and discontinues the car
- **Mercedes Benz** introduces the first **fuel injection** on its **300SL** sports car
- It was based on the company's 1952 sports racer, with mechanical direct fuel-injection which boosted power almost 50% on its 3-litre overhead camshaft straight-6 engine
- It had a top speed of 163 mph
- It was the fastest production car of its time
- It also has four wheel independent suspension and radial tires and disk brakes



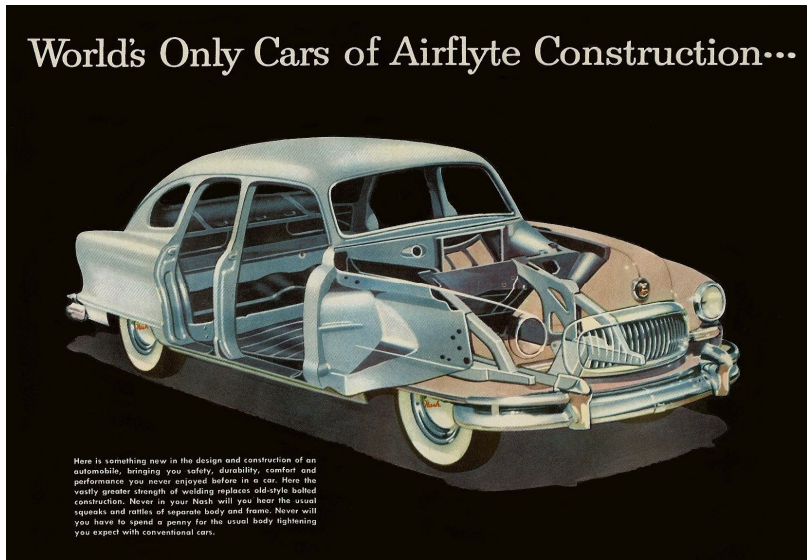
## Influential Cars of the 20 th Century

- **1953 Hudson** introduced a small low price **Jet** model
- The **Jet** was in response to the popular **Nash Rambler**
- The costs of developing and marketing the **Jet** ultimately led to **Hudson's** merger with **Nash**
- **GM** began production work on **Chevrolet's** fiberglass body sports car the **Corvette**



# Influential Cars of the 20 th Century

- **1954 Nash AirFlyte** –unibody structures
- **Packard merges with Studebaker**
  - **Studebaker Packard Co**
- **Nash Kelvinator merges with Hudson**
  - **American Motors**

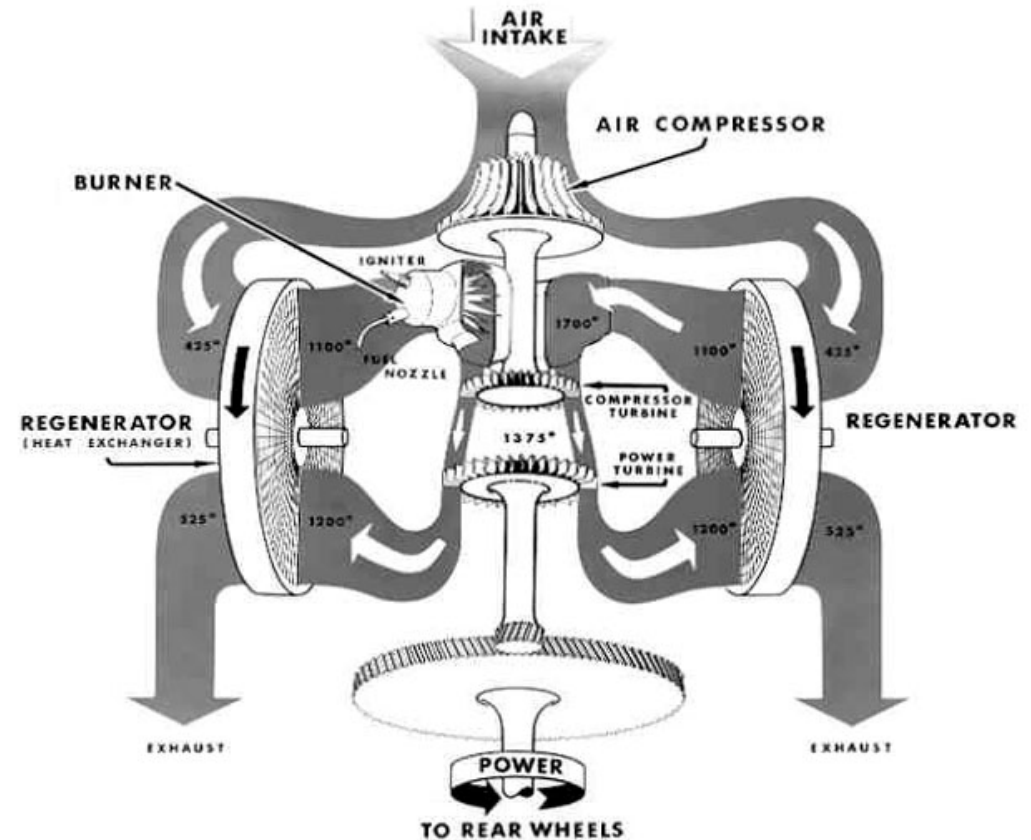


## Influential Cars of the 20 th Century

- 1954 **Chrysler** produces its first experimental gas turbine powered car-**Plymouth Sport Coupe**
- Experimental turbine engines were installed in cars in 1954 , 1956 ,1959 , 1960 , 1961 and 1964
- A **Chrysler** used a "regenerator", a heat exchanger that extracts heat from exhaust gases, to heat intake air reducing the amount of fuel required to be burned to achieve the required turbine inlet temperature



1964 Turbine Car –Chrysler’s Last Effort

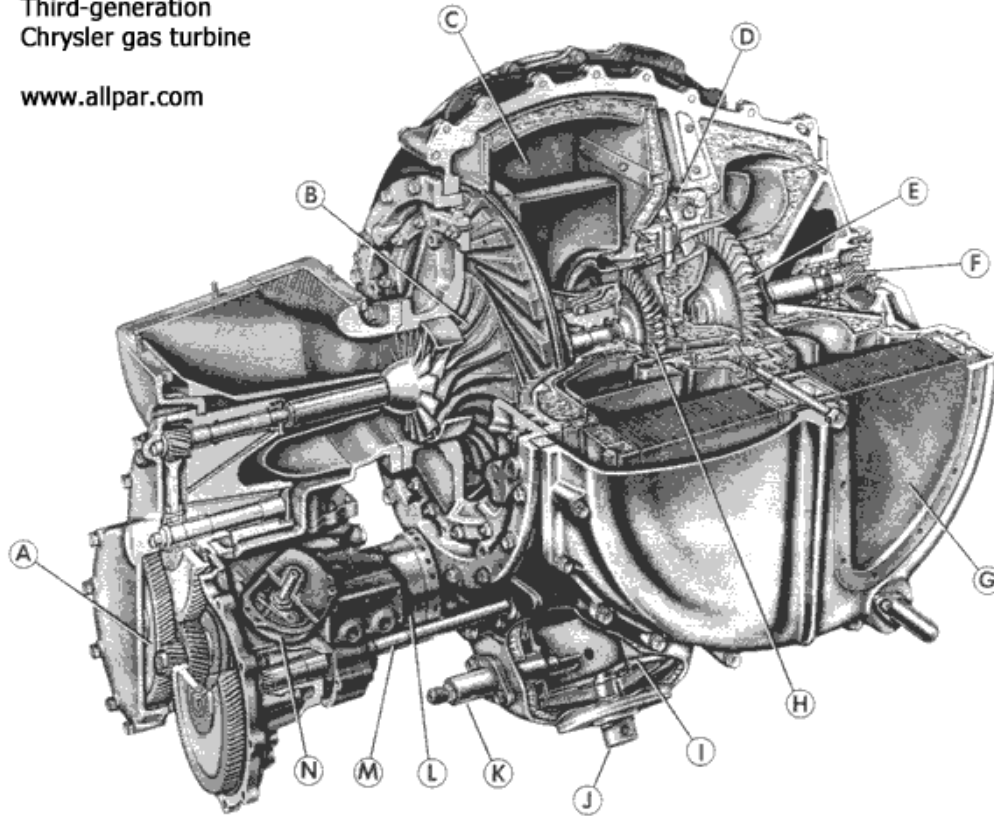


- The power turbine shaft was connected to a Torque Flite automatic transmission by a reduction gear
  - Reducing the shaft speed from ~45,000 to ~4,600 RPM

# Influential Cars of the 20 th Century-1964 Turbine Car Engine Specs

Third-generation  
Chrysler gas turbine

[www.allpar.com](http://www.allpar.com)



MAIN COMPONENTS OF THE TWIN-REGENERATOR GAS TURBINE:  
(A) accessory drive; (B) compressor; (C) right regenerator rotor;  
(D) variable nozzle unit; (E) power turbine; (F) reduction gear;  
(G) left regenerator rotor; (H) gas generator turbine; (I) burner;  
(J) fuel nozzle; (K) igniter; (L) starter-generator; (M) regenerator  
drive shaft; (N) ignition unit.

- 130 horsepower at 3,600 rpm (output shaft speed); **425** lb-ft of torque at **zero** rpm
- Weight: 410 lb - 25 inches long, 25.5 inches wide, 27.5 inches tall (without accessories, which make the overall length 35 inches).
- Fuel requirements: what've you got? diesel, unleaded gas, kerosene, JP-4, others. No adjustments needed to switch from one to the other.
- Compressor: centrifugal, single-stage compressor with 4:1 pressure ratio, 80% efficiency, 2.2 lb/sec air flow
- First stage turbine: axial, single-stage, 87% efficiency, inlet temperature 1,700 degrees F.
- Second-stage turbine: axial, single-stage, 84% efficiency, max speed 45,700 rpm
- Regenerator: dual rotating disks, 90% effectiveness, 22 rpm max speed
- Burner: single can, reverse flow, 95% efficiency
- Maximum gas generator speed: 44,600 rpm
- Maximum output speed, after reduction gears: 4,680 rpm
- Exhaust temperature at full power: 500 degrees Fahrenheit.

# Influential Cars of the 20 th Century

- **1955** Foreign cars capture ~14% of the U.S. market
  - Mostly small cars
  - Led by **VW Beetle** and **Renault Dauphine**
- **Toyota** releases its **Crown** to the market
- The first Toyota to be exported to the U.S. in 1958
- U.S passes the **Interstate Highway Act**
  - Construction of the Interstate highways will produce great changes in American life
- New models features:
  - Panoramic wrap around windshields
  - Safety padding on the dash boards
  - Cowl ventilator air intakes at the bottom of windshields



# Influential Cars of the 20 th Century

- **1955 Ford** introduces its two passenger **Thunderbird** in October 1954- a 1955 model
- The **Thunderbird** uses **Ford's** new 292 cu in **OHV** V8 engine
- **Safety door latches** are standard equipment on most models
- **Four door hardtop** models become popular
- **Cadillac** offers a trunk lid lock operated from the driver's seat



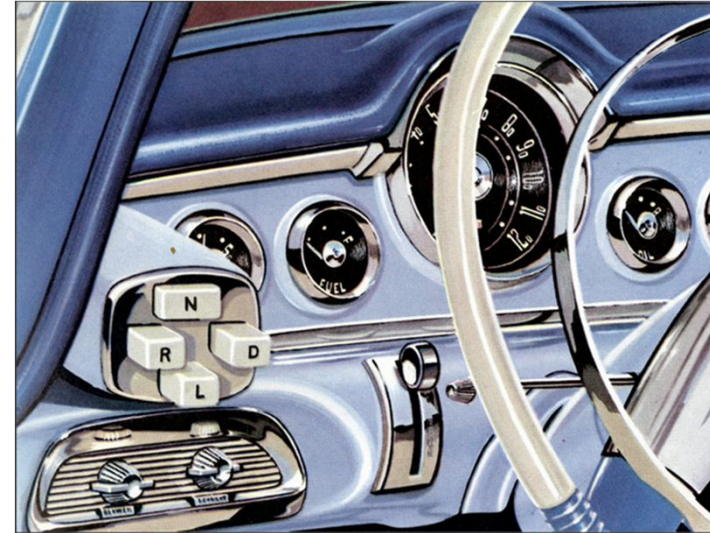
# Influential Cars of the 20 th Century

- 1955 **Lincoln Continental Mark II** is introduced
- It was is an ultra-luxury coupé that was sold for the 1956 and 1957 model years
- The **Mark II** was the worldwide flagship vehicle of **Ford Motor Company**
- The most expensive U.S. automobile of the time
- It was marketed against the **Rolls-Royce Silver Cloud**
- It was produced as a two-door hardtop coupe
- It used standard Lincoln mechanical components, including its "Y-block" V8 and automatic transmission
- 3,005 Continental **Mark IIs** were produced
- **Ford** lost thousands of dollars per car as car was largely hand-assembled



# Influential Cars of the 20 th Century

- **1956 Chrysler** introduces its **Torque Flite** automatic transmission –replaces Power Flite
  - Gear selection via push buttons on the dash
- Packard car production in Detroit stopped at the end of 1956
- All operations were transferred to the **Studebaker** plant in **South Bend , Indiana**



# Influential Cars of the 20 th Century

- 1957 The **Plymouth Fury** targets the youth market
  - Powered by V8 engines with twin four-barrel carburetors
  - Selling horse- power/performance
- 1958 The **Chrysler Imperial , New Yorker and Windsor** models were the first car with **cruise control**
  - Called “**Auto pilot**”
  - Cruise control had been invented in **1945** by **Ralph Teeter**



# Influential Cars of the 20 th Century

- 1957 **Studebaker** offered the **Scotsman**, a low price minimum trim model
- **Ford** offered a retractable hard top on its **Skyliner** convertible
  - Operation of the folding hardtop assembly alone required four lock motors, three drive motors, 10 power relays, 10 limit switches, eight circuit breakers, one neutral switch, one activating switch, one cycle indicator light switch, and 610 feet of wiring
  - This was in addition to a reinforced, 118-wheelbase chassis tasked with supporting the more than 400 pounds of added weight over the conventional soft-top Sunliner convertible



## Influential Cars of the 20 th Century

- Post war to the middle 1950s saw incremental improvements in automobiles
- New technologies were such as radial tires, introduced and spread throughout the industry
- In the U. S. the manufacturers “face lifted” their pre-war models while they worked to introduce redesigned models
- Not all the changes were styling , there were some new technical developments such as improved automatic transmissions, and fuel injection
- Chrysler, Rover and GM experimented with gas turbine power for automobiles but were unable to compete with the internal combustion piston engines
- An emphasis on auto safety began to be slowly embraced