



AUCKLAND
ART GALLERY
TOI O TAMAKI

California Dreamin'

Inspiring Innovative Car Design and Development

Dr Tony Robotham

21st July 2013



Today, why does every major
automotive manufacturer have an
advanced design studio in
California?



Overview

1850 – 1930

1930 – 1965

1965 – Today



1850 - 1930

A STATE IS CREATED

&

AN INDUSTRY IS FORMED

1850₁

1850 US Congress makes California the 31st State of the Union

1855 300,000 Gold Rushers "49ers" had come to California

Oil collected & refined

CALIFORNIA GOLD RUSH 1849



1854 Four-stroke cycle

patented by

Felice Malteucci

Eugene Barsanti



Four-stroke stationary engine 1850s



View of San Francisco in 1850, George Henry Burgess 1878

1860s

1861-1865 American Civil War

California has only a minor role

1869 Central Pacific Railway gets
to Utah &

connects to Omaha &
Chicago

Oil wells 1st dug

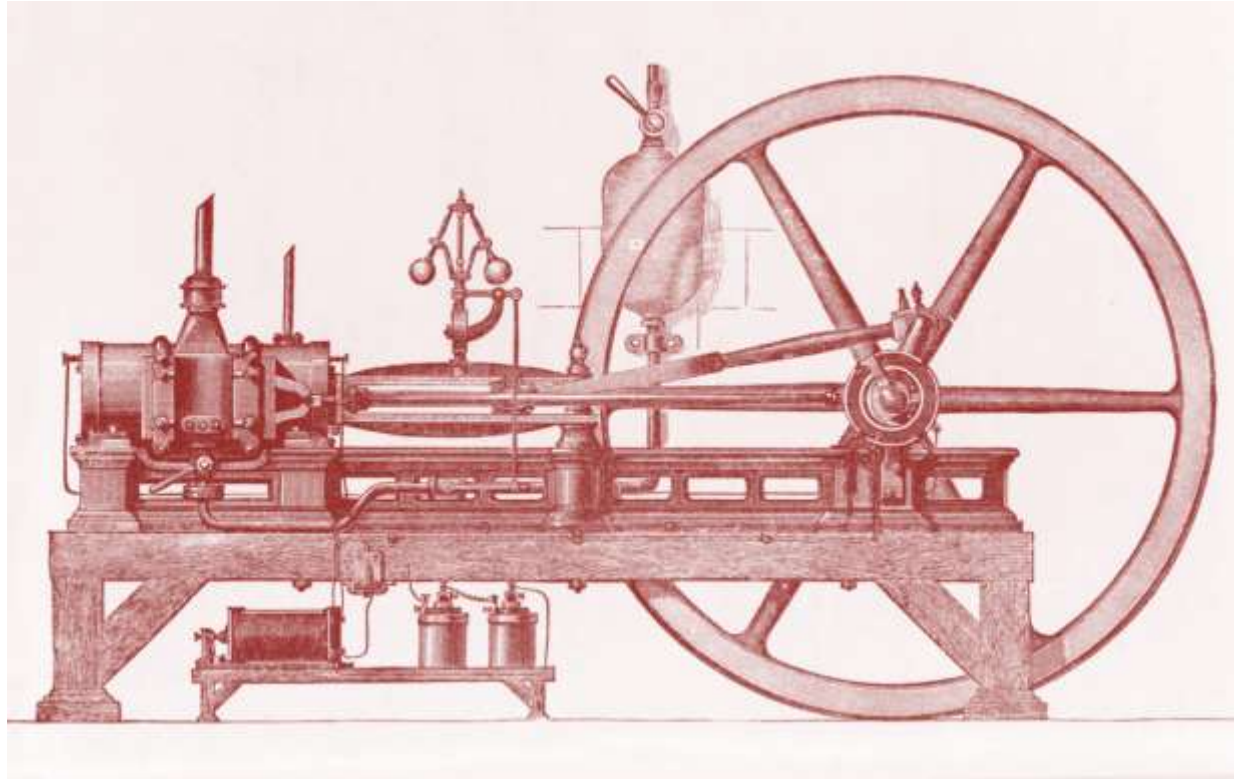


American railroad workers 1860s

1860 1st Engine to run on petroleum

patented by

Etienne Lenoir

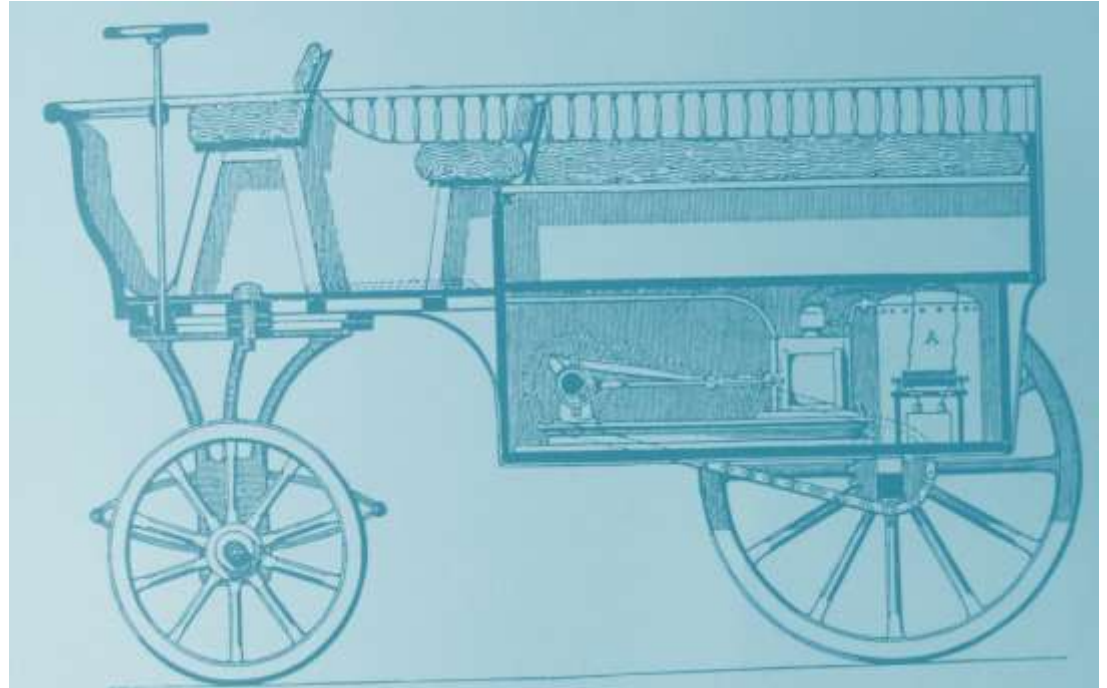


Petroleum stationary engine 1860s

1862 1st Vehicle to be powered by an internal combustion engine

built by

Etienne Lenoir



Coal-gas fuelled, two-stroke IC engine powered vehicle 1862

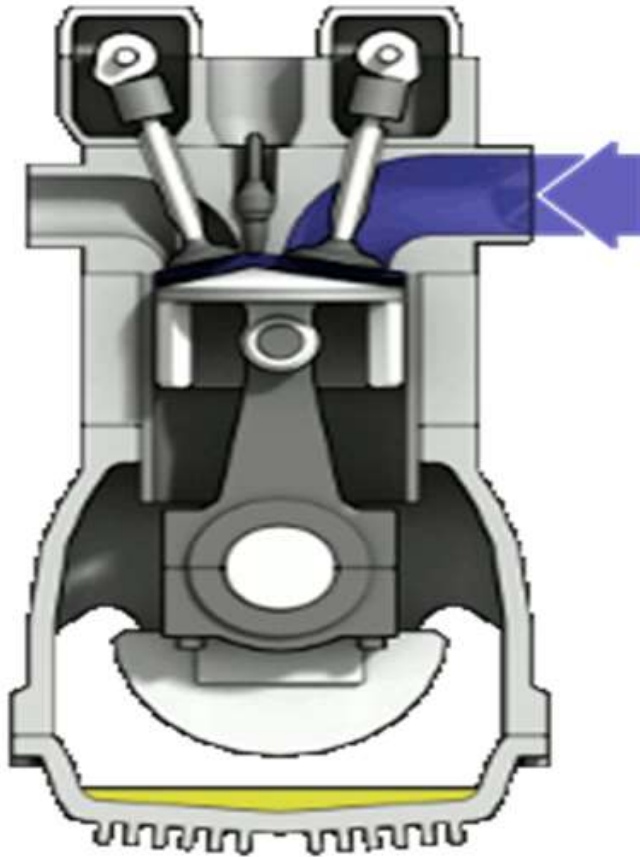
1870s

Nicholas Otto learns how to let a fuel-air mixture burn slowly

1876 Otto builds 1st four-stroke internal combustion engine

45,000 "Otto Cycle" stationary engines sold over next 10 years

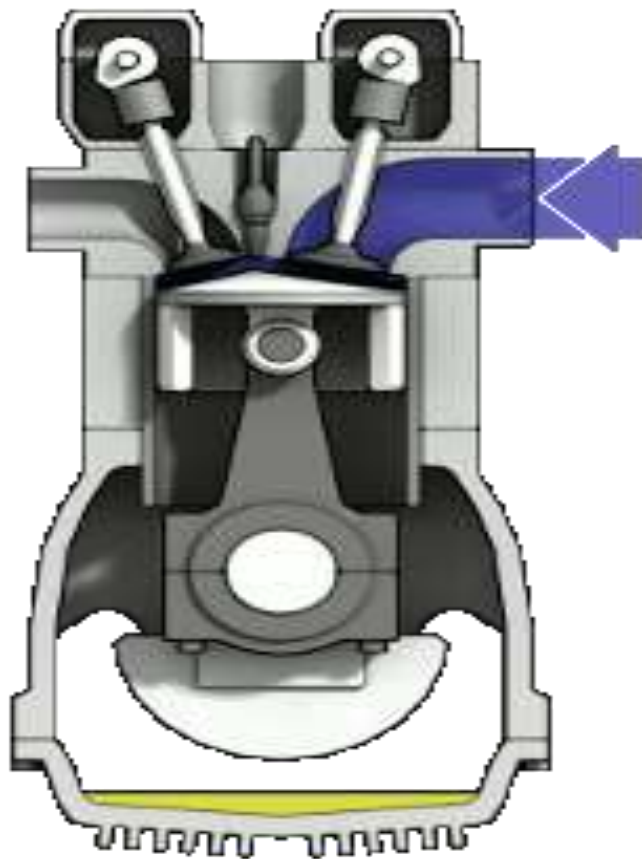
1



The Otto Cycle

a contemporary example

1



The Otto Cycle

a contemporary example

1. Induction

2. Compression

3. Combustion

4. Exhaust

1880s

Boom of the bicycle promotes a
culture of personal mobility

The automobile arrives



Gentleman Cyclist & League of American Wheelmen rally in the 1880s

The bicycle ...

“... directed men’s mind to the possibilities
of independent, long distance travel
over ordinary highways”

Hiram Maxim

1885 1st Motorcycle

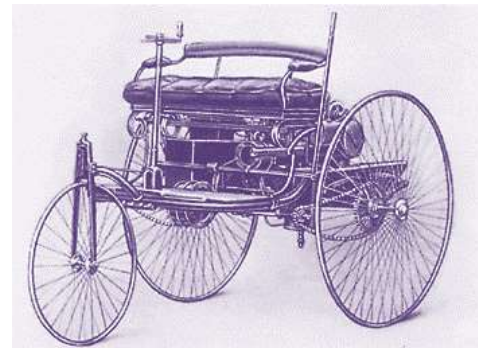
built by
Gottlieb Daimler
ridden by
Wilhelm Maybach



Four-stroke 0.5HP IC engine powered motorcycle 1885

1885 1st Automobile

built by
Karl Benz
patented
1886



Four-stroke IC engine powered automobile 1885





Spring Street, Los Angeles 1885

1890s

Fledgling US auto industry emerges

1893 USA's 1st practical gasoline powered car built by Duryea Bros.

1898 LA Automobile Club formed

1882 USA's 1st Gasoline Automobile

built by

Duryea Bros.



Duryea Runabout 1884



Charles & Frank Duryea 1st gasoline fuelled automobile built in USA 1882



Louis Perry electric automobile 1893



Henry Ford quadracycle 1896



Oldsmobile 1897



Thomas B Jeffery Rambler 1897



James W Packard 1898



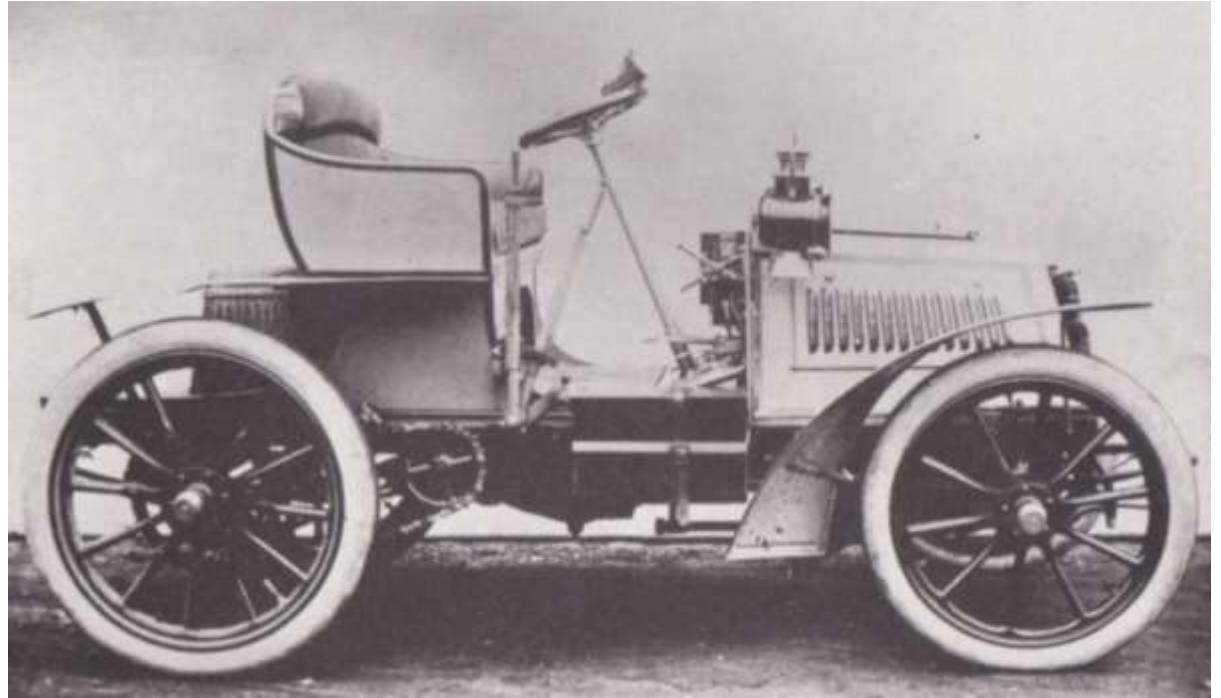
Whitney steam vehicles 1898

1890s Systemé Panhard

devised by

Panhard et Levassor

- Front mounted IC engine
- Clutch
- Sliding gear transmission
- Rear wheel drive



Panhard & Levassor 16HP roadster 1899



1900s

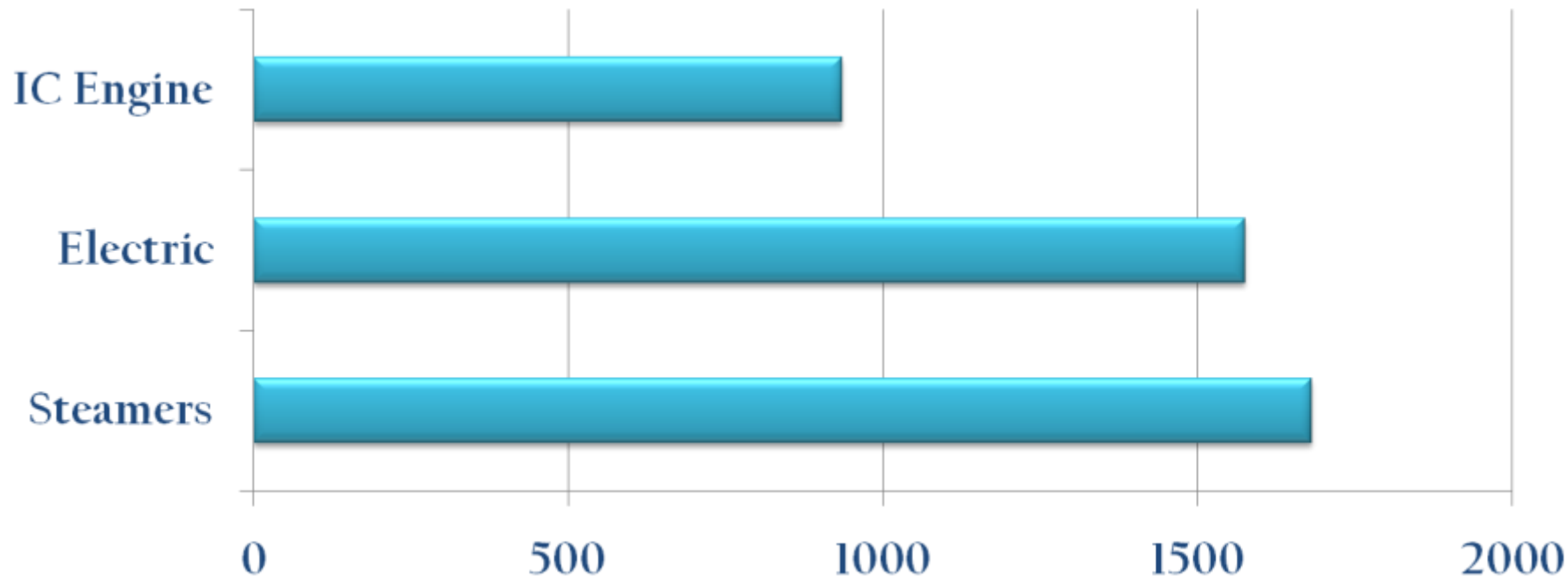
1903 Ford Motor Co. formed

1904 USA becomes world's largest auto maker 22,000 vehicles/year

1908 General Motors founded by merging of Buick with Oldsmobile

1909 GM acquires Cadillac & Pontiac

1900 Just 4192 cars in USA



1906 Steam Car Land Speed Record

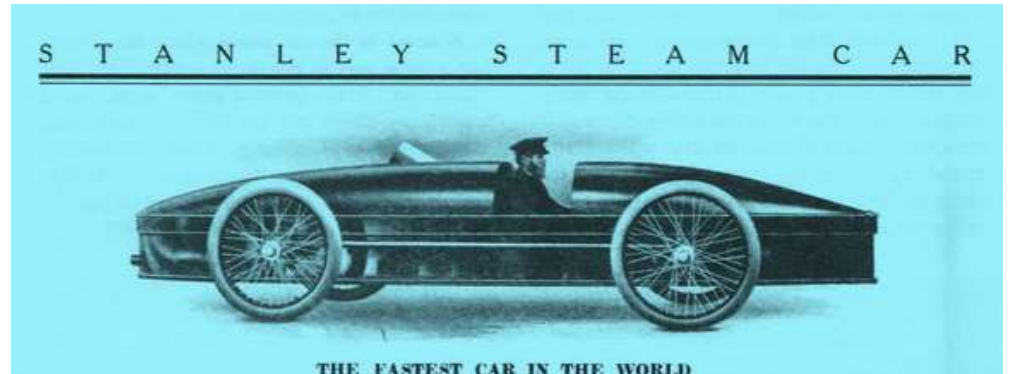
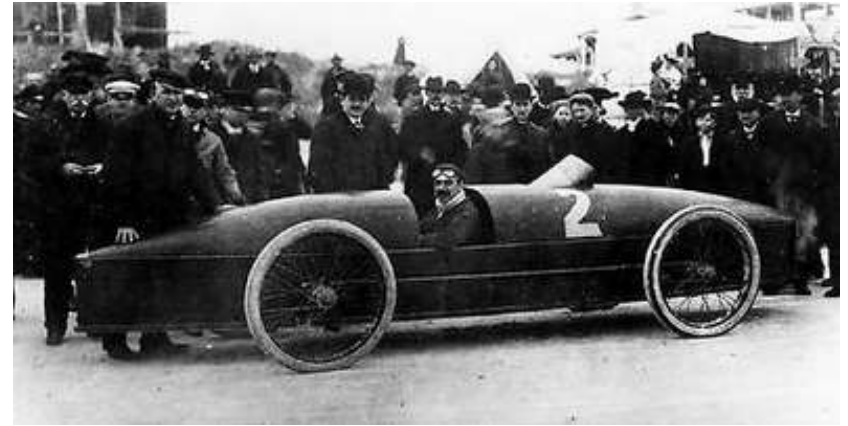
Built by

Stanley Bros.

driven by

Fred Marriott

127.66 mph



Stanley Steam Car sets Land Speed Record, Ormond Beach 1906



Curved Dash Oldsmobile 1901



National Model C Touring car 1904



Ford Model-A 1903



Baker Electric 1906



Studebaker Limousine 1908



Model F Stanley steam car 1908



Rambler 1902



Cadillac Model A 1903



Cadillac Model-M 1906



Ford Model-N 1906



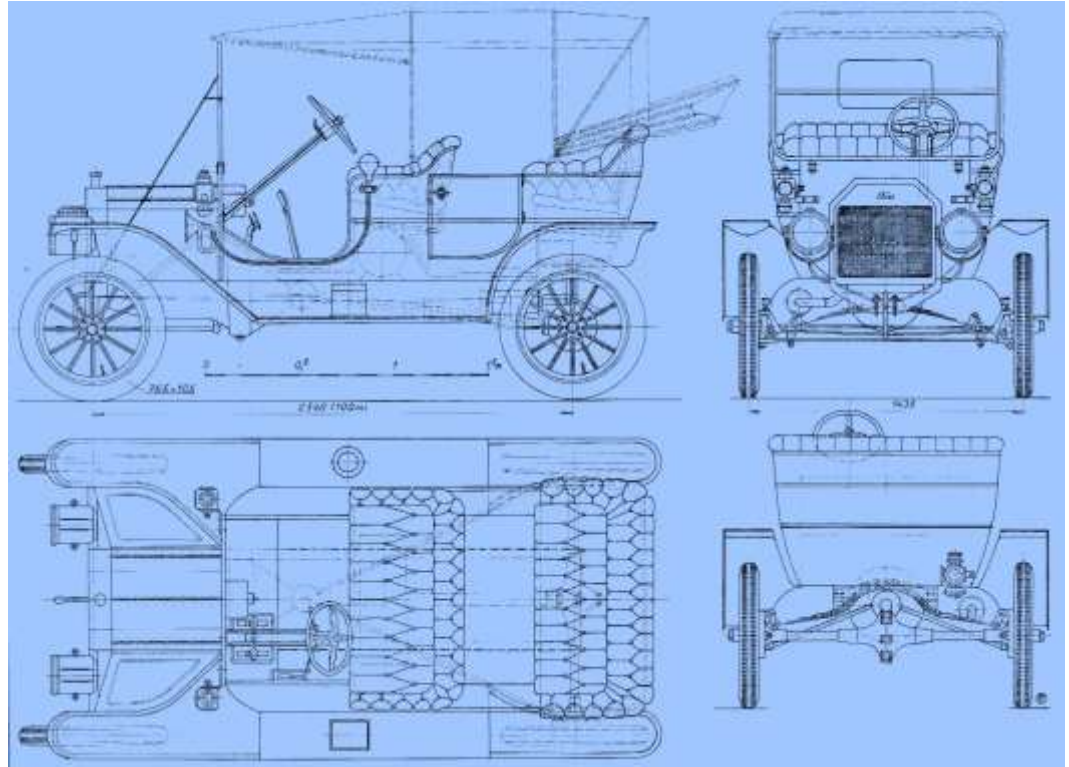
Ford Model-T 1908

1908 Ford Model-T launched \$950

devised by

Henry Ford

- 4-cylinder engine, separate cylinder head, integral block & crankcase, natural circulation cooling, gravity fuel feed
- 2-speed planetary gearbox with drum & band clutch
- Simple chassis with transverse springs at front and rear



1908-1927 Ford Model-T Production

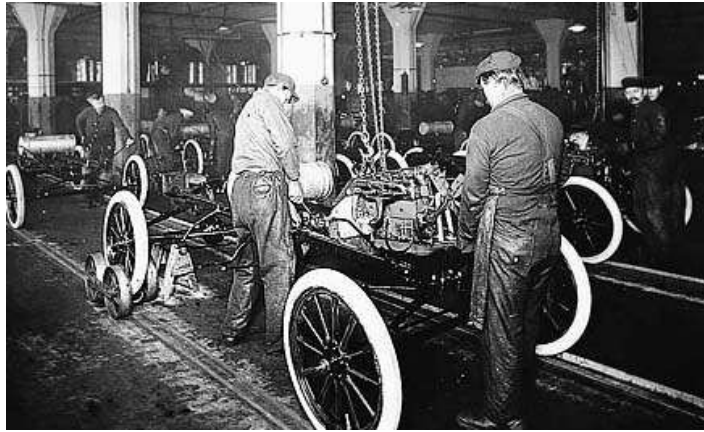
devised by

Henry Ford

- High strength steels (vanadium)
- Standardised product no costly variations
- Interchangeable parts
- Specialised tooling
- Low-skilled, low-cost labour
- Moving line assembly
- 93 minutes to make



Henry Ford & Model-T 1921





Ford

Higher Than Ever in Quality—Lower Than Ever in Price

Model T Torpedo

\$590

Ford Motor Company
Dearborn, Mich., U. S. A.

In every city and town, Ford Motor Company has a dealer who will show you the many advantages of the Ford Model T Torpedo. Write for literature to the nearest Ford Motor Company.





Earthquake & Fire ravage Dolores Street & Old City Hall, San Francisco 1906

1910s

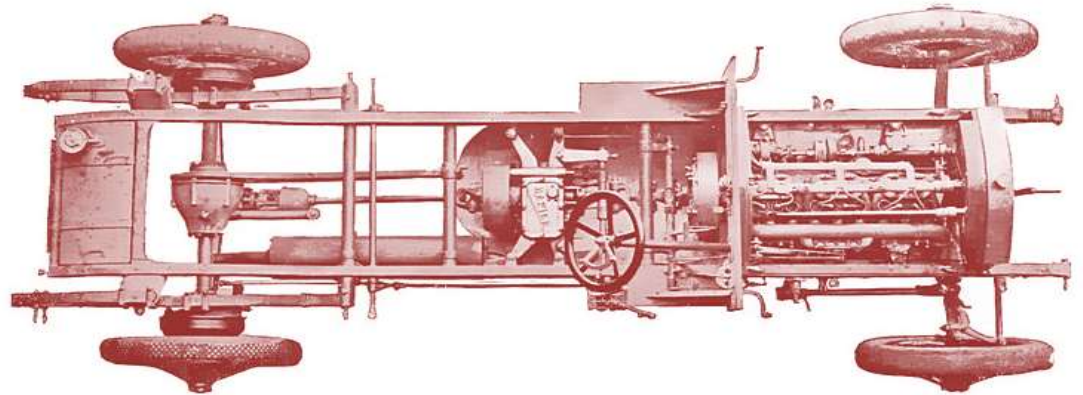
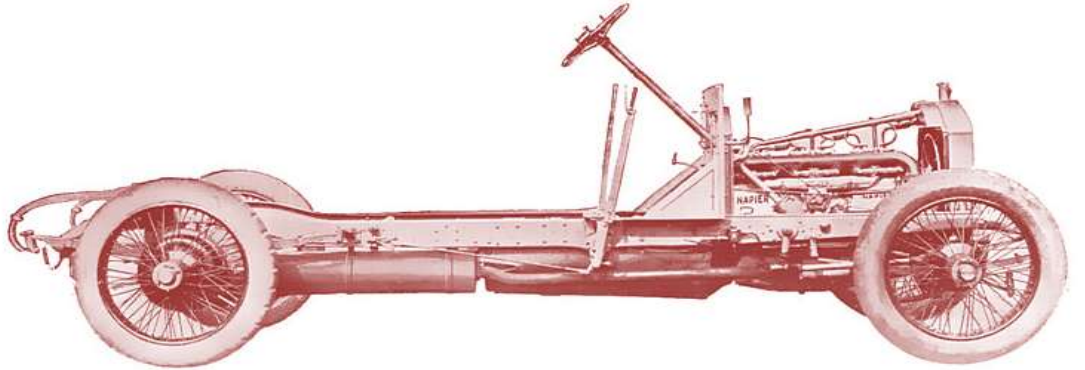
- 1912 Universal Studios founded
- 1913 Lincoln Highway - NYC to SF
- 1914 Ford starts production in LA
- 1915 Panama Canal opens
- 1918 Harley Earl starts work at
Earl Automotive Works



Nestor Motion Picture Co. opens first movie studio in Hollywood 1911

1910s IC engine & Systemé Panhard has triumphed

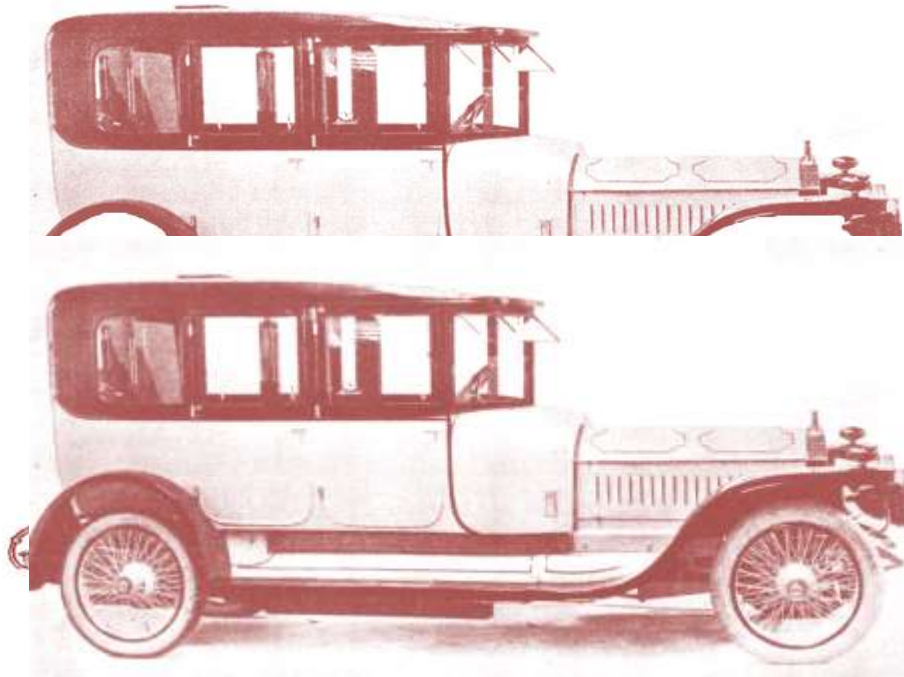
- Front mounted IC engine
- Clutch
- Sliding gear transmission
- Drive shaft to differential
- Rear Wheel Drive
- Rail Chassis



Napier Rolling Chassis 1912

1910s IC engine & Systemé Panhard has triumphed

- Custom built Coachwork
- Optional accessories



38 HP Napier Saloon 1912

1916 Chevrolet opens West Coast assembly plant in Oakland, Calif.



Chevrolet Factory, Oakland California c1917



Mercedes Touring 1911



Hupmobile 32 1912



Maxwell Messenger 1912



Cadillac 1913



Locomobile 48 1914



Packard 3-38 1915



Chevrolet 490 1916



Stanley Steam Car 1917



Packard Twin-Six 1918



Al Jolson



Hope Hampton



Rudolph Valentino



Edna Murphy



Dolores Del Rio



Anna Held



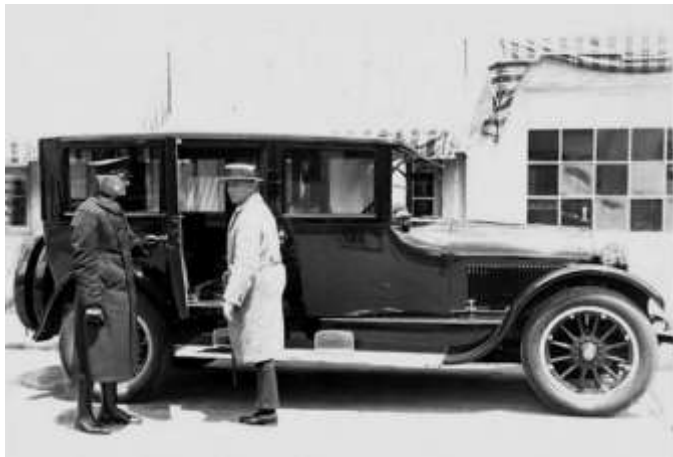
Jack Johnson



Marion Davies



Mary Pickford



Erich von Stroheim



Nancy Carroll



Anita Page



Fatty Arbuckle's Pierce Arrow 66 - styled by Harley Earl & coachbuilt by Earl Automotive Works 1919

1920s



1920 Prohibition starts

1925 San Luis Obispo Mo-tel

1926 Route 66 commissioned

1927 "The Jazz Singer"



Douglas Aircraft, Walt Disney,
MGM, Warner Bros, & Academy of Art
University founded in California

1920s

1920 Walter M Murphy establishes coachbuilders in Pasadena

“superlative quality ... the finest examples of custom jobs”

1927 Chrysler Corp begins auto assembly in California

1927 Harley Earl moves to Detroit to direct GM's Art & Color Studio



Duesenbergs by Walter M Murphy Coachbuilders 1920-1932



Cadillac - Harley Earl 1920





Duesenberg J Convertible Beline - Walter J Murphy Coachbuilder 1929

1927 Ford Model-T production ends

At its peak in 1923, 1,817,891 Model-Ts were built in one year & 50% of US cars were Model-Ts

In 1924, the price of a Model-T was merely \$260

26th May 1927 the last of 15,007,033 Model-Ts was produced

Factory closed for 6-months to re-equip for new automobile

1928 Ford Model-A goes on sale

The 1930s Approach

1929 26.7m cars registered in USA

US auto production peaks 5,337,087

The "Big Three" have formed

Ford Motor Company

General Motors - Buick, Cadillac, Oldsmobile, Pontiac, Chevrolet

Chrysler - Dodge, Plymouth, DeSoto

West Coast auto assembly has begun

Harley Earl leads 1st design studio



1930 - 1965

**THE STYLISTS TAKE CONTROL
&
COUNTER-CULTURES EMERGE**

1930s

Economic Depression

Styling adopts Art Deco
& Streamline Moderne

San Francisco builds
an iconic bridge



The FIRST with
the LATEST
Full United Press
teased wire

People's Paper
Santa Ana Register
Daily Evening
Orange County

**FINAL
EDITION**

VOL. XXIV. NO. 285.

Leading daily Orange Co., pop. 125,000 Santa Ana
city. Est. Established 1881. "Ready" Market. 1919.

SANTA ANA, CALIFORNIA,

MONDAY, OCTOBER 28, 1929

20 PAGES

3c Per Copy. 65c Per Month

BILLIONS LOST AS STOCKS CRASH

1930 The Great Depression sets in

- 25% of workers were unemployed
- 1 million family farms were repossessed
- Average family incomes reduced 40%
- 11,000 banks went out of business
- 9 million savings accounts lost
- 2 million people homeless
- 60% of Americans were "poor"



1930 Ford opens new assembly plant in Southern California



Ford Factories in California 1930



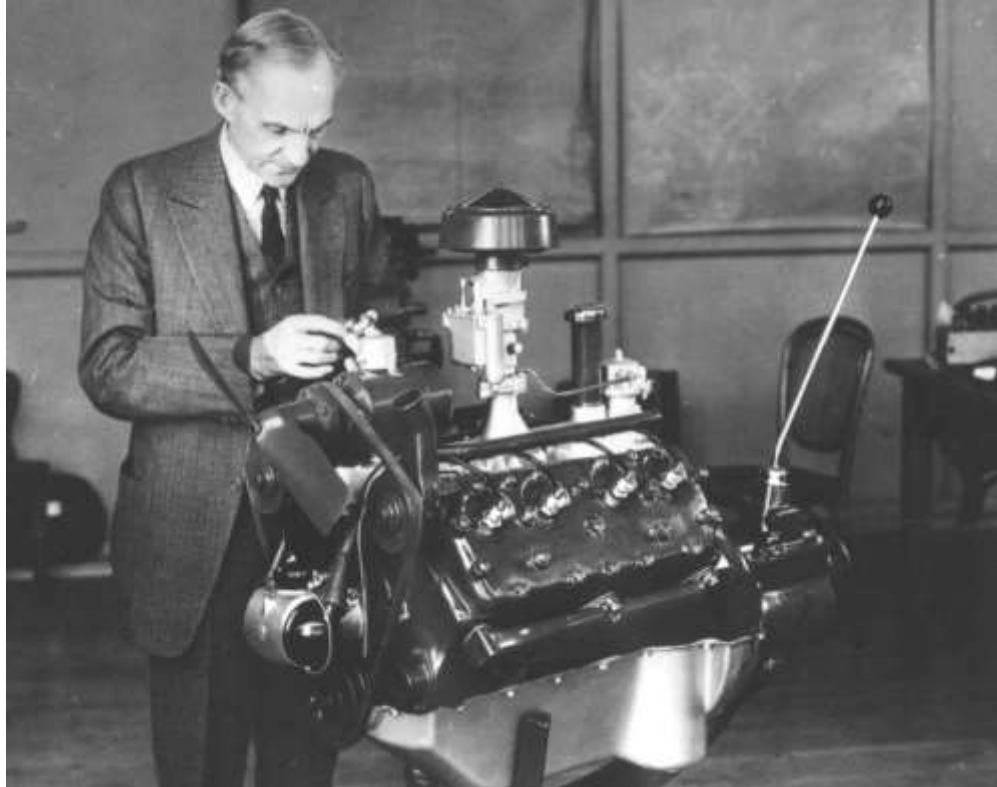


Ford Model-A 1930s



Ford Model-B 1932

1932 Ford V8 "flathead" arrives



Henry Ford with new "flathead" V-8 engine 1932



Lewis Bandt - Ford Australia Model-B Utility 1932





Dolores del Rio - Cord L-29 Town Car - Walter J Murphy Coachbuilder 1930



Dolores del Rio - Cord L-29 Town Car - Walter J Murphy Coachbuilder 1930



Duesenberg J Coupe - Walter J Murphy Coachbuilder 1931



1932 Raymond Loewy turns to autos





Packard 900 Shovel Nose 1932





Auburn Speedster 1933



ART DECO

AUTOMOBILES





Chrysler Airflow - the first mass-market streamline automobile 1934



Edsel Ford's Model 40 Special Speedster 1934









Clark Gable - Duesenberg Model JN Convertible Coupe - Christian Bonham & Maurice Schwarz Coachbuilders 1935







Dolores del Rio - SS Delahaye Coupe 1936



Phantom Corsair - Bonham & Schwarz Coachbuilders 1938



1938 Harley Earl's 1st Concept Car



1938 Harley Earl's 1st Concept Car



1938 Studebaker commission Loewy



Raymond Loewy designed Broadway Limited Steam Engine with Studebaker President Sedan 1938 & Hearse 1939



Lincoln Zephyr Convertible Sedan 1939





Packard Super 8 180 Convertible Victoria - Howard "Dutch" Darrin Coachbuilder 1939



Packard Super 8 180 Convertible Victoria - Howard "Dutch" Darrin Coachbuilder 1939



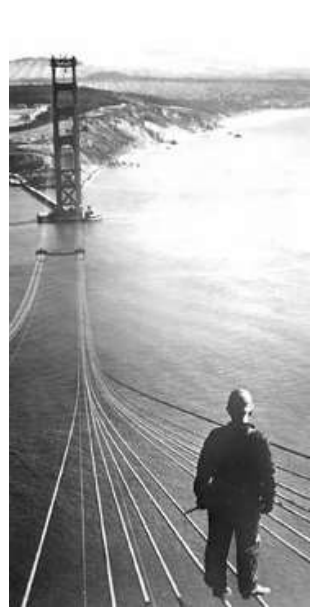
Packard Super 8 180 Convertible Victoria - Howard "Dutch" Darrin Coachbuilder 1939



Streamline Moderne California



Hawley Bowlus designed Airstream Clipper trailer 1935



Golden Gate Bridge opens 1937



Golden Gate Bridge opens 1937

The Wheels Fall Off

US Auto Closures

Luxury

Peerless (1932)

Marmon (1933)

Franklin (1934)

Duesenberg (1937)

Pierce-Arrow (1938)

Stutz (1938)

Medium

American Austin (1935)

Auburn (1936)

Graham Paige (1940)

Hupmobile (1940)

American Bantam (1941)

The Wheels Fall Off

US Auto Survivors

General Motors
Chrysler
Ford Motors

} 85%

Willlys

Packard

Studebaker

Hudson

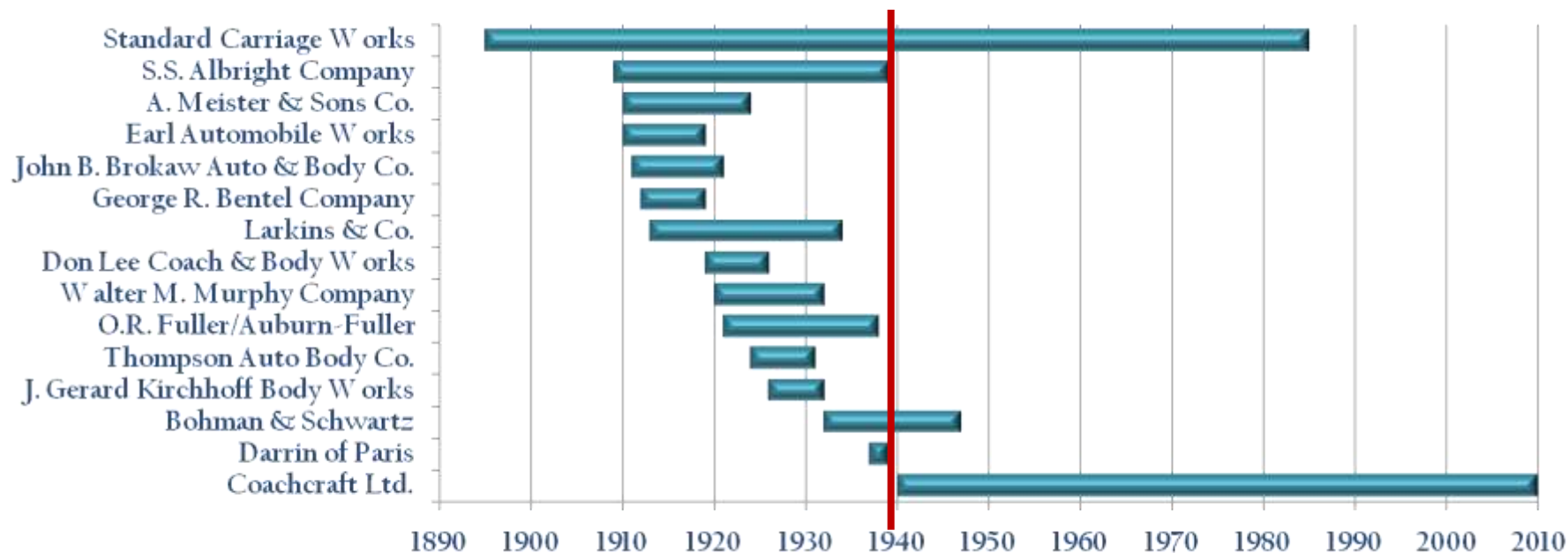
Nash

Bonham & Schwarz - Coachbuilders

Airstream - Trailers

The Wheels Fall Off

Californian Auto Studios



1940s

The World at War Again

Auto production ceases

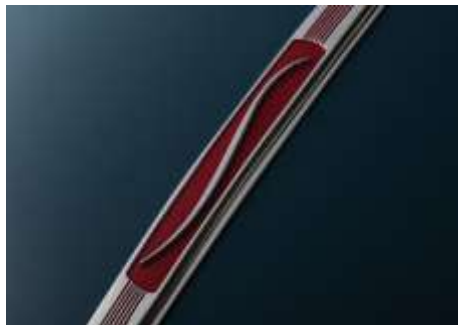
California grows by 50%







Chrysler Newport dual-cowl phaeton - Indy 500 pace car 1941



Raymond Loewy - Studebaker Commander Sedan 1941



22 Feb 1942 civilian automobile production stops

75 essential products

4,131,000 engines

- 450,000 aircraft engines

27,000 aircraft

- 7,000 B24 Liberator (Ford)

2,500,000 trucks

- 600,000 Jeeps (Willys, Ford, American Bantam)

\$29bn military goods

47% machine guns

57% tanks

85% army helmets

87% bombs



Icons of the War effort - Rosie the Riveter & Wendy the Welder

Post-War & 1950s

Prosperity returns

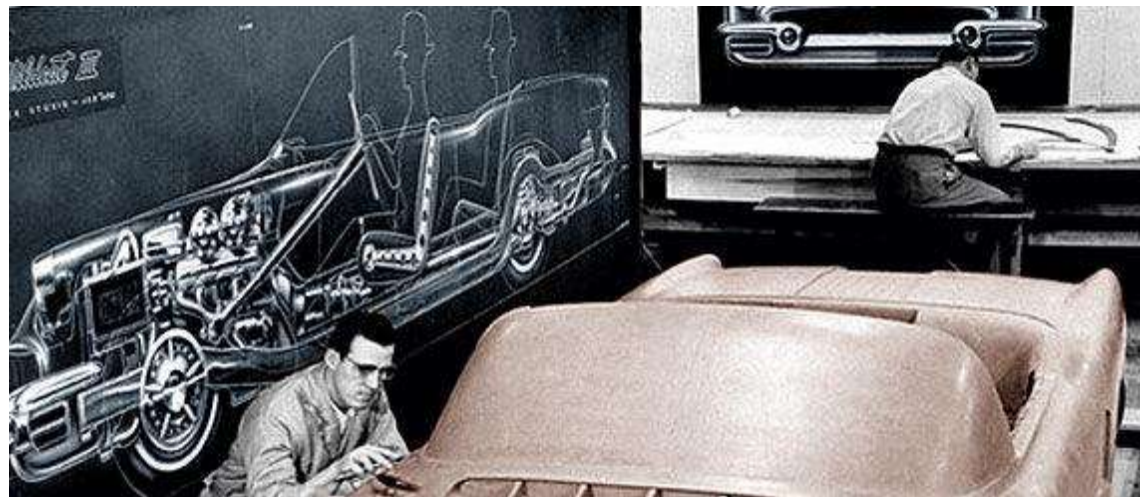
Space-age exuberance
& flamboyancy

Custom Car Culture

My primary purpose ...

“to lengthen and lower the American automobile,
at times in reality,
and always at least in appearance”

Harley Earl (1954)





In the market for a car that's sweet, smooth, and sunny?

Chev's got 20 to pick from!

Here's the whole beautiful lineup of '55 Chevrolets. And every line runs from the "Mini-Pony" to their Sedan to the sleek new Custom—brings you a special, spirited way of going that's Chevy's alone!

See your favorite "Chevy" at your Chevrolet Dealer. Chevrolet Division of General Motors, Detroit 2, Michigan.

1. The "Mini-Pony" 4-door Sedan
2. The "Mini-Pony" 2-door Sedan
3. The "Mini-Pony" 4-door Sedan
4. The "Mini-Pony" 2-door Sedan
5. The "Mini-Pony" 4-door Sedan
6. The "Mini-Pony" 2-door Sedan
7. The "Mini-Pony" 4-door Sedan
8. The "Mini-Pony" 2-door Sedan
9. The "Mini-Pony" 4-door Sedan
10. The "Mini-Pony" 2-door Sedan
11. The "Mini-Pony" 4-door Sedan
12. The "Mini-Pony" 2-door Sedan
13. The "Mini-Pony" 4-door Sedan
14. The "Mini-Pony" 2-door Sedan
15. The "Mini-Pony" 4-door Sedan
16. The "Mini-Pony" 2-door Sedan
17. The "Mini-Pony" 4-door Sedan
18. The "Mini-Pony" 2-door Sedan
19. The "Mini-Pony" 4-door Sedan
20. The "Mini-Pony" 2-door Sedan

CHEVROLET
I USA
BY CHEVROLET

Harley Earl & the GM "Design Damsels" 1950s



Delores del Rio - Cadillac Series 62 1948





Harley Earl - Le Sabre Concept Car 1951





Harley Earl - Prototype Chevrolet Corvette 1953









Harley Earl tailfins - Cadillac Club Coupe Fastback 1954



A Californian favourite - Porsche 356 Speedster 1955





Another Californian favourite - Mercedes-Benz 300 SL Roadster 1957















Tailfins - Dodge Custom Royal & Cadillac Eldorado 1959







Harley Earl Legacy

Custom Cars for Hollywood Stars

1st Director of Styling

"Dynamic Obsolescence"

Clay Modelling

Concept Car

"Design Damsels"

Factory Two-Tone Paint

Tailfins



Harley Earl Legacy

Harley Earl Protégés

Richard Teague (American Motors)

Eugene Bordinat (Lincoln-Mercury)

Frank Quick Hershey (Ford)

Elwood Engel (Chrysler)

Virgil Exner (Chrysler)

George Walker (Ford)

William Mitchell (GM)



Custom Culture

















*Chicken-Race ...
Rock 'n Roll...*



SPEED CRAZY THRILLS AS
WILD YOUTHS TEAR UP THE STREETS!

MACREMA PRODUCTIONS
present

HOT-ROD GIRL

starring

LORI NELSON • JOHN SMITH • CHUCK CONNORS

and introducing ROXANNE ARLEN and MARK ANDREWS

with FRANK J. GORSHIN • CAROLYN KEARNEY • ED REIDER • DEL ERICKSON

Directed by LESLIE MARTINSON • Produced by NORMAN HERMAN • Executive Producer DAVID T. YOKOSEKI

Original Screenplay by JOHN MCGREEVEY • Released by AMERICAN-INTERNATIONAL PICTURES



ARE
THESE
OUR
CHILDREN?

HOT ROD

Magazine



Photo by Floyd Whittier

Bob Pearson's '36 Competition Coupe

AUGUST, 1948 25c

HOT ROD

Magazine

BOB PIERSON WITH 142 MPH
RECORD-HOLDING COUPE

APRIL 1950

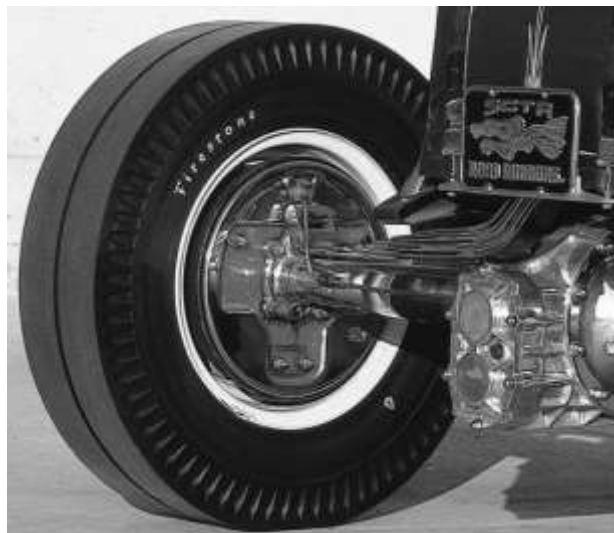
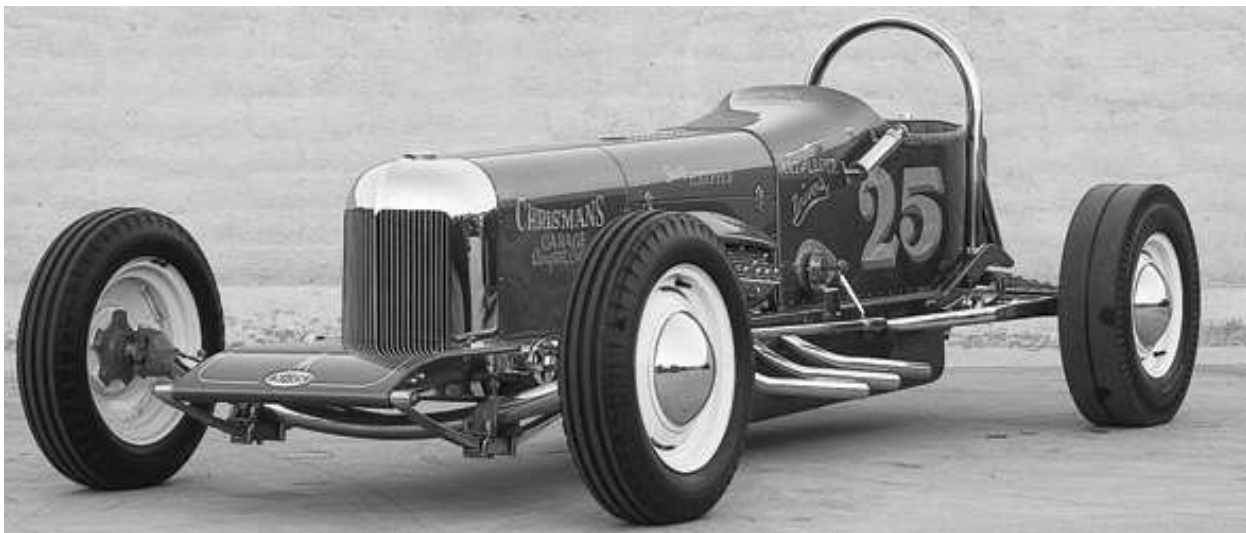


T W E N T Y - F I V E C E N T S





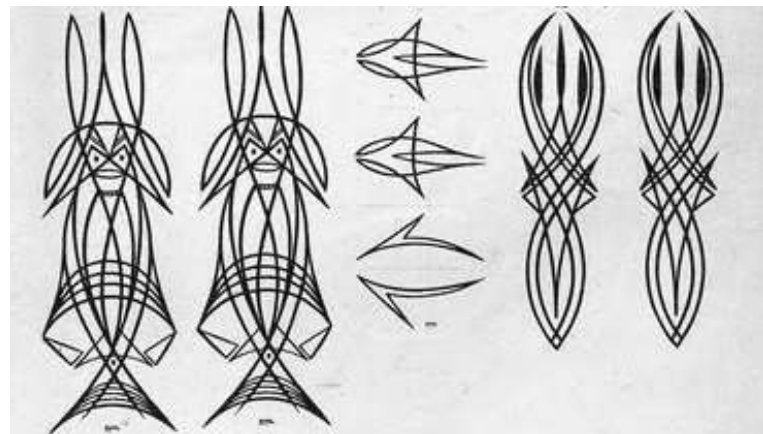












Von Dutch







1960s

California becomes the most
populous state in USA

1950s exuberance makes way
for the muscle car

Surfs Up!





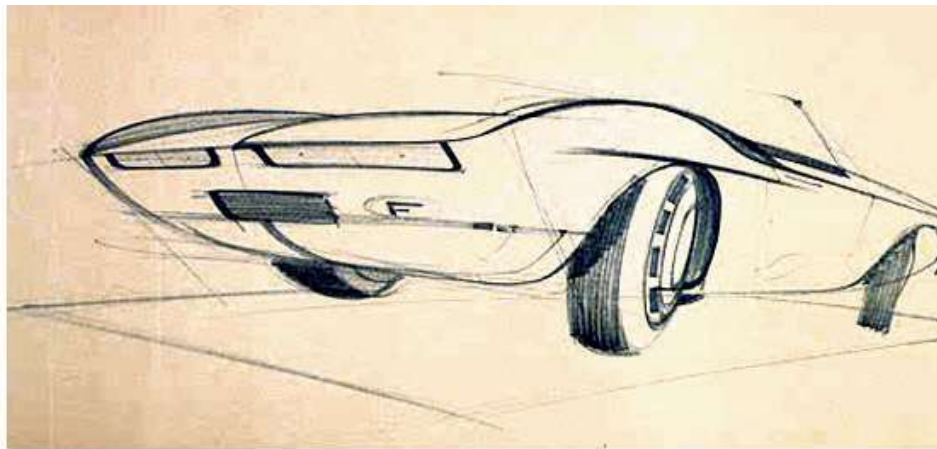
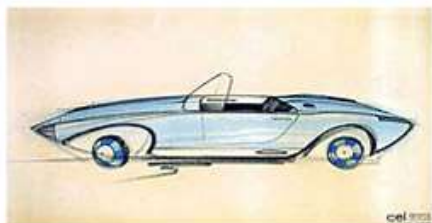
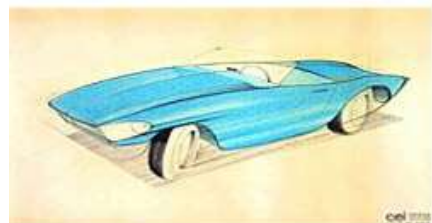


361 cu in (5.9 l) V8 - Plymouth Fury Convertible 1960











Raymond Loewy - Studebaker Avanti 1962







396 cu in (6.5 l) V8 - Chevrolet Corvette C2 Stingray 1965













Steve McQueen as "Bullitt" 1968



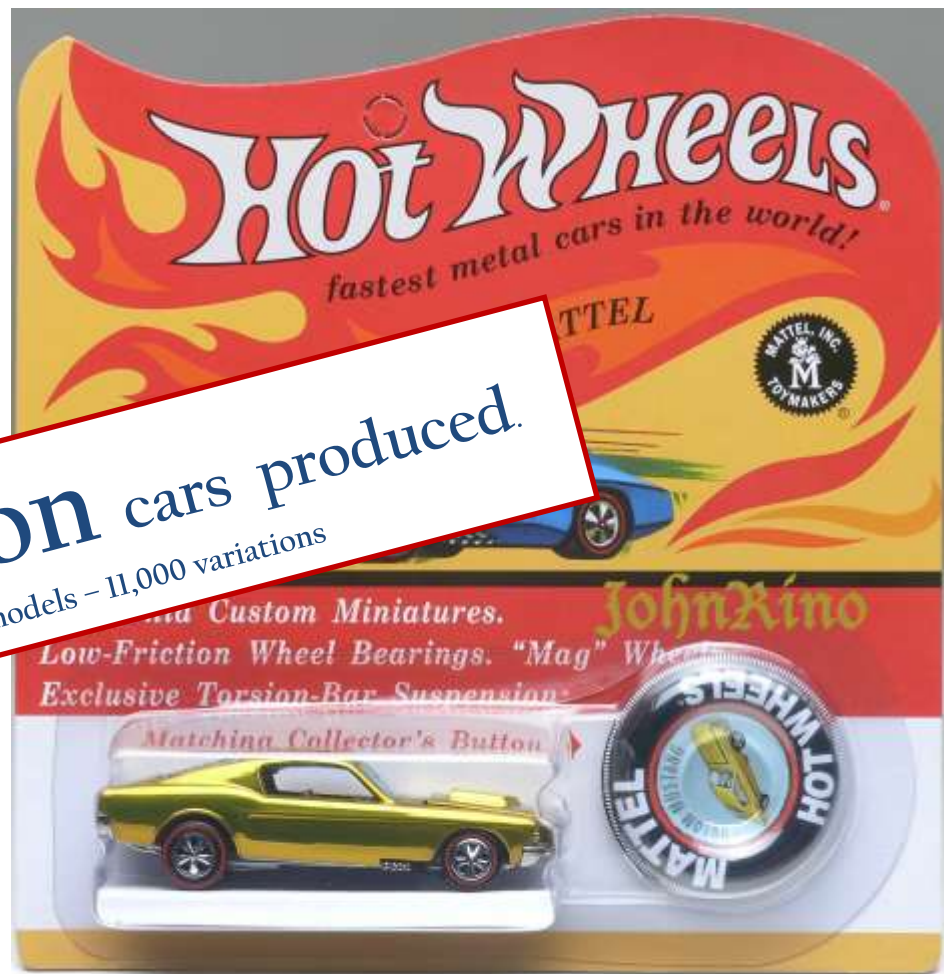




The Coolest Dude on the Beach ... Steve McQueen with Faye Dunaway in "The Thomas Crown Affair" driving a Bruce Meyers Manx Dune Buggy, 1968



4 billion cars produced.
800 models – 11,000 variations





User Car Lot, California 1960s



1965 - Today

LIFE GETS SERIOUS

&

NEW CAR MAKERS ARRIVE

Safety

1965 49,163 auto deaths

Vietnam War 47,424 combat deaths

"Unsafe at Any Speed"

1965 Ralph Nader publishes
Chevrolet Corvair

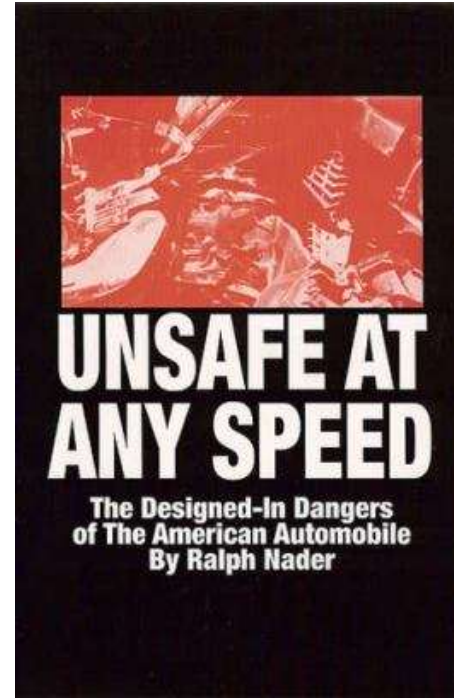
- Spins & rollover crashes

Second Impact

- Deaths & injuries to passengers

Smog

- Tailpipe emissions & pollution









LA smog in 1948 & 1966

Automakers had expended ...

“millions for glitter and hardly one cent for
defense of the health and protection of the
American citizens against smog”

L.A. County Grand Jury July 1958

Comstock vs General Motors reveals...

“the utter abdication of responsibility and a deliberate withholding of lifesaving facts”

Ralph Nader 1965

California Cleans Up

1966 Exhaust emissions legislation

– CO, NO_x & Pb

1975 Catalytic converters

2009 Smog & Global
Warming Scores



Εσοδοι

Oil Crisis

1973 Yom Kippur War – OPEC cuts oil supplies to USA



Oil Crisis

1975 Fuel Economy targets set

1978: **18.0 mpg** (7.65 km/l)

1985: **27.5 mpg** (11.7 km/l)

US cars ave. 13.2 mpg, imported cars ave. 22.2 mpg

1978 "Gas Guzzler" tax

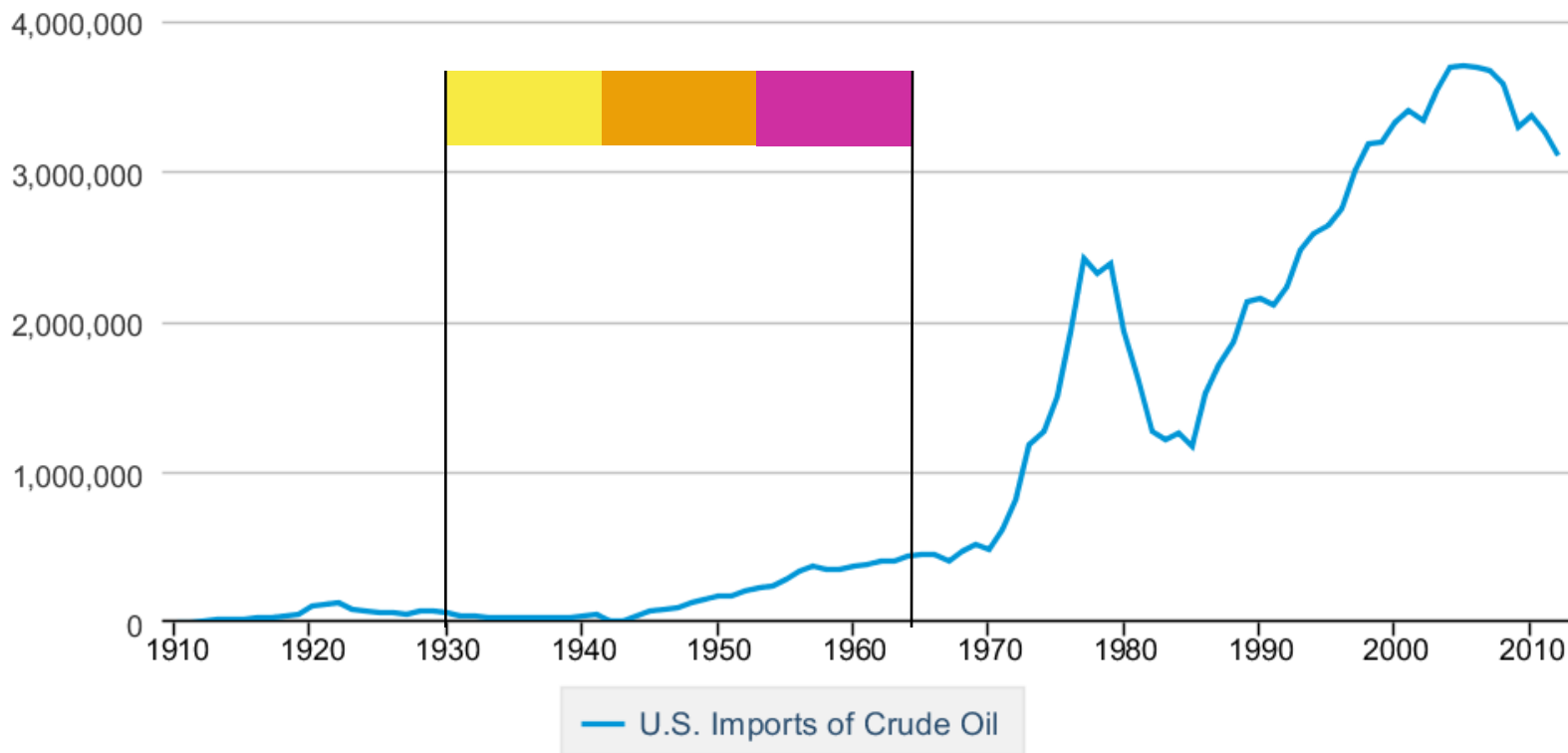
1979 Iranian revolution

Crisis – What Crisis?

1980 80% US cars powered by V8s

U.S. Imports of Crude Oil

Thousand Barrels



Quality

Crisis – What Crisis?

1978–80 US car sales drop 2.5m

1979 6.25 million US cars recalled



1979 \$1bn losses for Chrysler



Japanese Automakers Arrive

1960 Japan exports just 7,000 cars

1967 Japan makes 1 million cars

1974 Japan becomes world's largest exporter of automobiles

Japanese Automakers Arrive

1982 Honda opens 1st US auto plant

Nissan, Toyota, Subaru, Mitsubishi
& Mazda soon follow

1984 GM-Toyota opens auto assembly
plant in Fremont, California



Final Inspection of Honda Accord, Marysville, Ohio 1982





Economy

Reliability

Quality



The Honda Accord LX. Economize in luxury.

If you plan to give up your luxury car because it costs too much gasoline, you might consider replacing it with our 1980 Honda Accord LX.

1980 HONDA ACCORD LX
5-SPEED
25 EPA EST. MPG, 33 HWY.
MPG, 208.25 MPG FOR
COMPARISON YOUR MILE-
AGE MAY VARY DE-
PENDING ON WEATHER,
SPEED, AND TRIP LENGTH.
ACTUAL MPG MILEAGE
WILL PROBABLY BE LOWER.
FIGURES LOWER FOR COLD
AND HIGH ALTITUDE DRAG.

Why? Because the Accord LX provides the kind of gas mileage usually associated with cars less lavishly equipped: 25 EPA estimated mpg, 33 highway mpg.

A glance at the instrument panel reveals the elegant nature of the Accord LX. Everything you see is standard, including air conditioning, remote door power steering, quartz digital clock, automatic maintenance reminder,

electronic warning system, even a padded coin box.

Further standard features are remote control outside mirror, tonneau cover, front-wheel drive, four-wheel independent suspension, Michelin steel-belted radial tires, and velvety tricote upholstery. Optional this year on all Accords is our new fully automatic 3-speed transmission.

As you can see, fuel economy and automotive elegance are not mutually exclusive, at least not in the 1980 Honda Accord LX. That being the case, why not give up your luxury car for a luxury car?

HONDA

We make it simple.



© 1980 American Honda Motor Co., Inc.







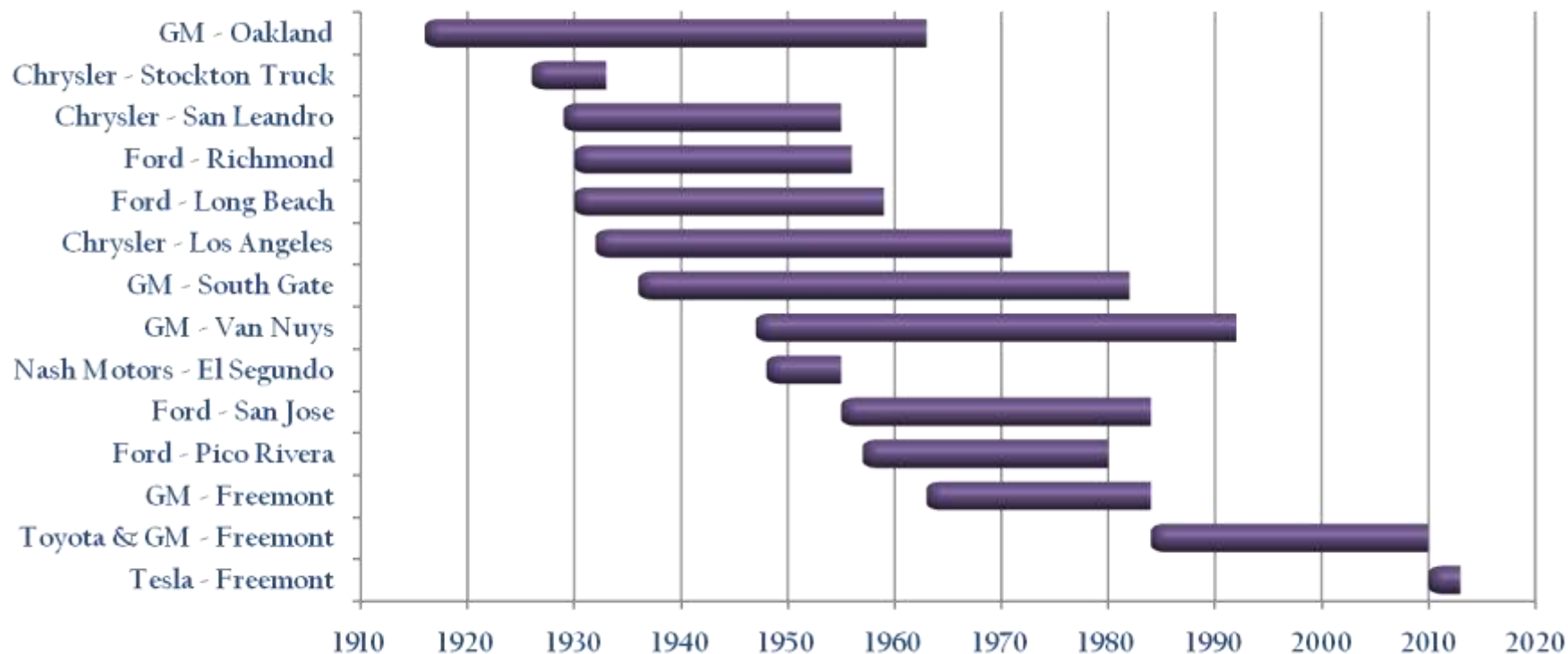








Auto Manufacture Leaves California



Auto Manufacture Leaves California

Company

- Show All Grouped Markers ✓
- BMW Manufacturing Co, LLC
- Chrysler Group LLC
- Ford Motor Company
- General Motors
- Honda Manufacturing
- Hyundai-Kia
- Mercedes-Benz/Daimler
- Mitsubishi Motors
- Nissan North America Inc
- Tesla**
- Subaru
- Toyota
- Volkswagen Group of America



2012 Alliance of Automobile Manufacturers

AUTO ECONOMICS

STATE FACTS : AUTOS IN CALIFORNIA

INDUSTRY IMPACT

412,580 total Auto Jobs in state

5.2% of U.S. Auto Jobs

2.0% of State Job Force

\$63.51 Billion in New Car Sales

10.42% of U.S. Car Sales

STATE REVENUE

Auto-related taxes and fees generated **\$10.90 Billion** to the state of California, total

\$2.21 Billion in new vehicle taxes

\$1.38 Billion in used vehicle taxes

\$585 Million in sales taxes on auto parts and services

\$6.54 Billion in vehicle taxes (including gas taxes), licenses and fees

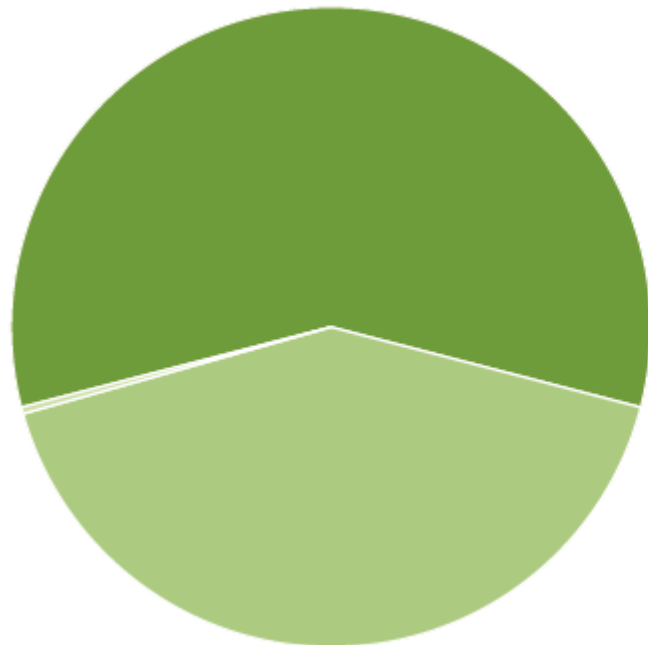
\$80 Million in Auto Dealer Business Taxes and Estimated Dealer Title Fees

\$103 Million in Income taxes from payments for automakers, suppliers and dealers

AUTO ECONOMICS

STATE FACTS : AUTOS IN CALIFORNIA

30,958,596 REGISTERED VEHICLES

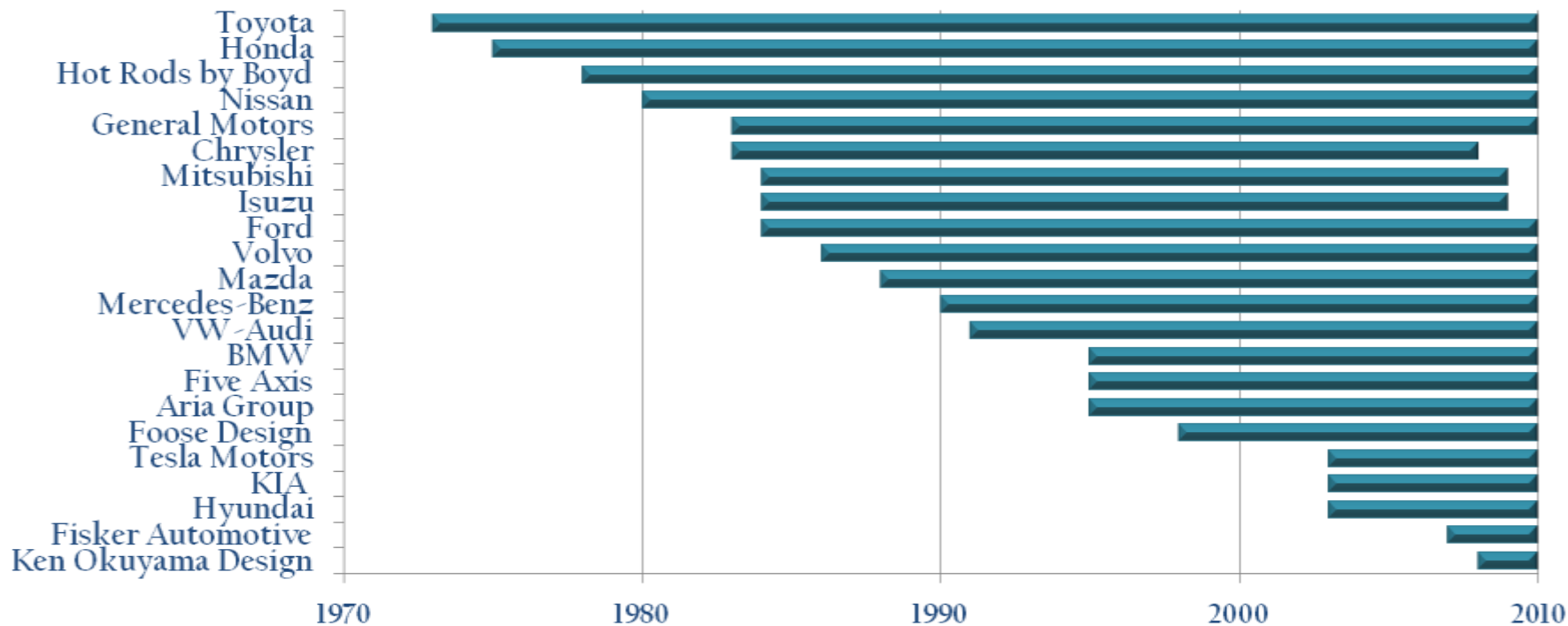


- 17,977,605 Cars (58.07%)
- 12,878,553 Trucks (41.60%)
- 102,438 Other (0.33%)

581 cars /1000 pop.

based upon 2010 Census pop. 37,253,956

Auto Design Returns to California



To build an American best seller...

“... it helps to know what the people in the
community want.

So, for 40 years, we've employed local talent to
help us discover exactly that”

Toyota Calty Design Research

The LA Design Center has ...

“the challenging and exciting responsibility of
envisioning the products customers will want
tomorrow - and beyond”

Honda R&D North America

Our mission ...

“to create attractive designs for the excitement
of our customer's everyday life”

Nissan Design











Audi



e0ra



eSpiral



**GM
HERO**
















And so ... Today

...why does every major automotive manufacturer have an advanced design studio in California?



“California is *America*, only more so”

Wallace Stegner (1959)

On the Pacific coast ...

“... fewer shackles on tradition

... an unslackening development of new thought

.... a decided willingness to take chance
on new ideas”

Henry Dreyfuss

















DON'T EVEN
THINK!
ABOUT SPEEDING













California Dreamin'

Many Thanks to ...

AUT University
Auckland Art Gallery
Petersen Automotive Museum, California

References

Rudi Volti (2004) "Cars and Culture"
100s of websites & other publications