

Curator's Choice: Top 15 Engines Exposed

There are more than 40 on display, but here, Matt Anderson, curator of transportation at The Henry Ford, describes some of his favorites.

1 2009 Ford Focus Electric

Electric Motor: AC, permanent magnet, 105 kilowatt, 141 horsepower

Ford previewed its entry into the electric vehicle market with this car specially built for *The Jay Leno Show*. The sizable AC/DC inverter dominates the space under the hood, with the electric motor mostly hidden underneath. Note the large fan at front, to keep the motor cool. Also note the prominent "Caution" decal on the inverter. Modern automobile power plants are better than ever, but the days of the shade tree mechanic may be gone for good!

2 1956 Chevrolet Bel Air

V-8 cylinder engine, overhead valves, 265 cubic inches displacement, 205 horsepower

It's the most enduring 8-cylinder American automobile engine. Chevrolet introduced its "small block" V-8 in 1955 — and kept on building it until 2003. Nearly every General Motors division used some variant, and total production is over 100 million, including later development generations. Not bad for an engine designed in 15 weeks. The compact unit is all but swallowed up by the Chevy's engine bay. Note the relatively small-sized radiator, too. Efficient cooling was one of the small block's many advantages.

3 1960 Chevrolet Corvair

Horizontally opposed 6-cylinder engine, overhead valves, 140 cubic inches displacement, 80 horsepower

The compact Corvair reimagined the American automobile. Not least among its peculiarities was its rear-mounted, air-cooled aluminum engine. The air cleaner is prominent, with two hoses leading to carburetors mounted on each cylinder bank. Much of the engine is hidden by a metal shroud that directed the air flow around the unit. With its light weight and air cooling, the Corvair power plant proved popular with home airplane builders.

4 1978 Dodge Omni

Inline 4-cylinder engine, overhead valves, 105 cubic inches displacement, 75 horsepower

Small cars pack a lot into tight spaces. The Omni makes the most of its engine bay by mounting the unit transversely, with the crankshaft parallel to the front bumper. It's a layout not widely used in American cars since the early 1900s, but particularly well-suited to compact front-wheel-drive vehicles. Power is sent to the Omni's front wheels via the transaxle, a combination gearbox-differential, on the driver's side.

5 2002 Toyota Prius

Gasoline Engine: Inline 4-cylinder engine, double overhead cam, 91 cubic inches displacement, 76 horsepower
Electric Motor: AC, permanent magnet, 33 kilowatt, 55 horsepower

Two power plants sit side-by-side under the Prius' hood. The transverse internal combustion engine is on the passenger's side, while the electric motor is on the driver's. An electrical inverter, perched atop the motor, converts the DC current supplied by the batteries to the AC used by the motor. When the car brakes, the motor becomes a generator transforming kinetic energy into electricity sent back to the batteries.

6 1931 Bugatti Type 41 Royale

Inline 8-cylinder engine, single overhead camshaft, 779 cubic inches displacement, 300 horsepower

From its length, one might expect more than eight cylinders under the Bugatti's hood. But each of those cylinders displaces more than the whole of a Volkswagen Beetle's power plant. Four air cleaners stand over the engine, fitted to the four carburetors installed by Charles Chayne after World War II. Two spark plugs protrude from each cylinder. The steering box sits just behind the right fender, in keeping with the car's right-hand-drive layout.

7 1936 Lincoln Zephyr

V-12 cylinder engine, L-head valves, 267 cubic inches displacement, 110 horsepower

Edsel Ford introduced the lower-priced Zephyr to help Lincoln through the Depression. Its V-12 engine, adapted from Ford's monobloc V-8, banked its cylinders at 75 degrees, allowing the unit to fit neatly into the streamlined body. Unfortunately, inadequate ventilation and poor oil flow led to overheating and excessive wear. Still, with 200,000 sold, it remains the most successful American-built V-12.

8 1948 Tucker 48

Horizontally opposed 6-cylinder engine, overhead valves, 334 cubic inches displacement, 166 horsepower

Many features of Preston Tucker's futuristic sedan challenged convention, and its rear-mounted power plant was no exception. When his 589-cubic-inch engine proved unworkable, Tucker turned to Aircooled Motors, whose D-335 unit, typically used in helicopters, was converted to water cooling, laid on its side and slid snugly into the sedan. Tucker claimed the 320-pound engine could be removed and replaced in 18 minutes.

9 1956 Chrysler 300-B Stock Car

V-8 cylinder engine, overhead valves, 354 cubic inches displacement, 355 horsepower

They didn't call the Chrysler 300 letter series luxury cars "bankers' hot rods" for nothing. The 1956 300-B's big V-8 achieved that holy grail of one horsepower per cubic inch. The cars dominated NASCAR, where rules still restricted teams to stock power. Note the cutout in the right wheel well and the nearby spotlight. These modifications allowed the driver to check tire wear through a hole in the firewall.

10 1965 Goldenrod

Four V-8 cylinder engines, overhead valves, 426 cubic inches displacement each, 600 horsepower each

It takes a lot of horsepower to break 400 miles per hour. Goldenrod has four Chrysler HEMI engines driving all four wheels. The two front engines power the front axle, while the rear units turn the back wheels. The drive shafts run to the left of the engines, with power moved via transfer cases. Remarkably, the engines are unmodified stock units, apart from low-profile fuel injectors to fit under the 28-inch-high hood line.

11 1933 Willys Drag Racer

V-8 cylinder engine, supercharged, single overhead camshaft, 427 cubic inches displacement, 1,200 horsepower

Originally equipped with a 414-cubic-inch Cadillac V-8, and then a 389 Chevy V-8, "Ohio George" Montgomery's Willys got its current 427 Ford in 1966. The Ford engines were in such short supply that Montgomery received his a few pieces at a time. The magnesium supercharger at top pumps a pressurized fuel-air mixture into the cylinders, and the exhaust pipes venting directly from the cylinder heads eliminate back pressure. Both features increase the engine's power.

12 1960 Meskowski Race Car

Inline 4-cylinder, double overhead cams, 255 cubic inches displacement, 400 horsepower

The 4-cylinder Offenhauser engine, designed by Harry Miller, refined by Fred Offenhauser and first seen on racetracks in the early 1930s, is the most celebrated engine in American motor sports. The "Offy" scored 27 Indianapolis 500 wins from 1935 to 1976. The cylinder head and crankcase are a single unit, permitting higher pressures. The large pipes on the engine's left side feed air into the fuel injectors. The rubber baseballs keep out dirt when the engine isn't running.

13 1919 Ford Model T

Inline 4-cylinder engine, L-head valves, 177 cubic inches displacement, 20 horsepower

Mechanical simplicity was one of the secrets behind the Model T's success. The engine has no fuel pump, relying on gravity to feed the carburetor. There is no water pump either, as a thermosiphon effect was used to circulate cooling water. The cylinder head removes in one piece for easier servicing. Electric start was first available in 1919. The electrical system's generator is just visible at the front of the engine.

14 1907 White Model G

Inline 2-cylinder compound steam engine with condenser, 30 horsepower

The White's steam engine was designed for efficiency. Steam first expanded in the smaller high-pressure cylinder at rear, then expanded again in the larger low-pressure cylinder at front. The condenser in front of the engine, resembling a radiator from an internal combustion car, captured exhausted steam and converted it back into water, to be used again. These devices gave the Model G a claimed range of 150 miles on a 17-gallon water tank.

15 1963 Chrysler Turbine

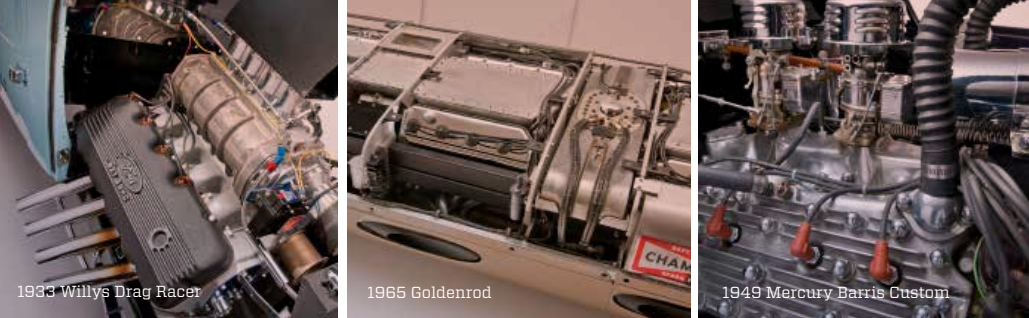
Regenerative gas turbine engine, 130 horsepower

Chrysler experimented with turbine engines for some 25 years. The Turbine could run on almost anything — gasoline, diesel, kerosene, even peanut oil (with exhaust that smelled like baking cookies)! While the fuel flexibility was terrific, the fuel economy was less than stellar. Chrysler ended the Turbine program in 1979. Note the huge air filter housing in front of the engine. The Turbine gulped about four times more air than a piston engine.



Engines Exposed Exhibit Map

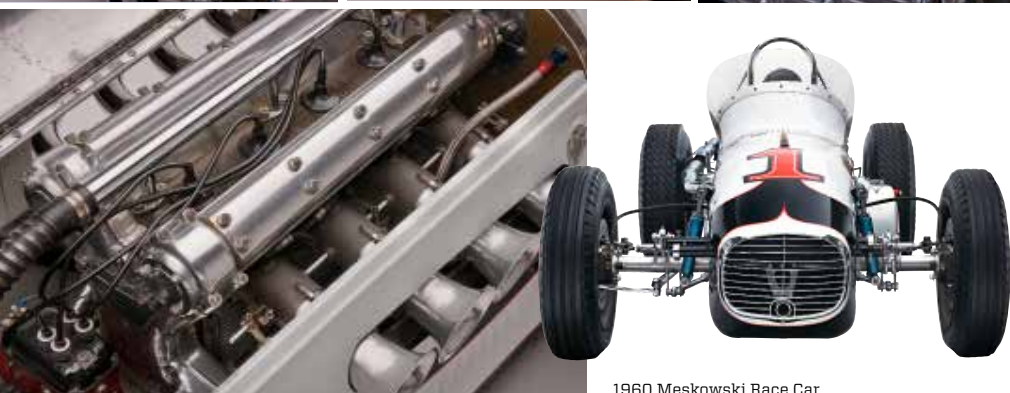
Check out more autos with their hoods popped. Need help locating? See a museum presenter for assistance.



1933 Willys Drag Racer

1965 Goldenrod

1949 Mercury Barris Custom



1960 Meskowski Race Car

When we look at an automobile, we are moved by what we see on the outside — its styling. But what moves the car is on the inside — its engine. Please join us for a rare look under the hoods of some of the finest automobiles at Henry Ford Museum. More than 40 cars have their engines exposed for you.

Daily Programming

Exploring Engine Innovations

What engine innovations drove the auto industry? Let our presenter give you the behind-the-scenes details on some unique autos in our collection, as well as an opportunity to learn about key innovations in the history of engines in a multimedia presentation.

Daily: 10 a.m., 11 a.m., 1 p.m., 2 p.m., 3 p.m. (20 minutes), Douglas Drive-in

Curator Close-Up

Curious what Matt Anderson, curator of transportation at The Henry Ford, has to say about engine innovations? Listen and view innovations and some exceptional engines with our digitized collection.

January 10, January 17 and March 14: 1 p.m., Douglas Drive-In

Corliss Engine

How does that engine work, and what does it have to do with engines today? We can help! See the mighty Corliss Engine power up, and experience firsthand the science behind its power, efficiency and precision.

Daily: 10:30 a.m., 1:30 p.m., Power Section of Made in America

Fun Kiosk Activities

Want to explore our engine collection on your own? Get up close with some great engine photography and more? Discover “Power Option” activities on one of our 18 digital kiosks throughout *Driving America*.

Tinker. Hack. Invent. Saturdays

Want to get your hands dirty with special engine-related activities? Join us at Tinker. Hack. Invent. Saturdays “Around Engines.”

10 a.m. - 3 p.m., Henry Ford Museum Plaza

Saturdays in January — The Power to Go!

Early autos ran on gasoline, steam or electricity. Come explore the positives and negatives of these fuel options through cool power demonstrations and hands-on exploration. Tinker with magnets to learn how they help create motion. You can then apply that know-how to assemble an electric car. Car assembly not recommended for children under 8 years of age.

Saturdays in February - Internal Combustion

Today, cars run on gasoline, but how do internal combustion engines really work?

Explore the inner workings of engines. Help create working models of pistons, cams and valves, and discover how they make us move. Then create an automaton using these same engine mechanics to create motion.



Into Autos?

Then get set to go even further with THF OnWheels. Subscribe at thehenryford.org/enews.

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thehenryford.org/motormuster



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Greenfield Village • Sept. 12-13, 2015
Open Saturday 'til 9!
FREE with membership

Rev it up with hundreds of authentic vehicles from the 1890s to the 1930s at America's longest-running antique car show.

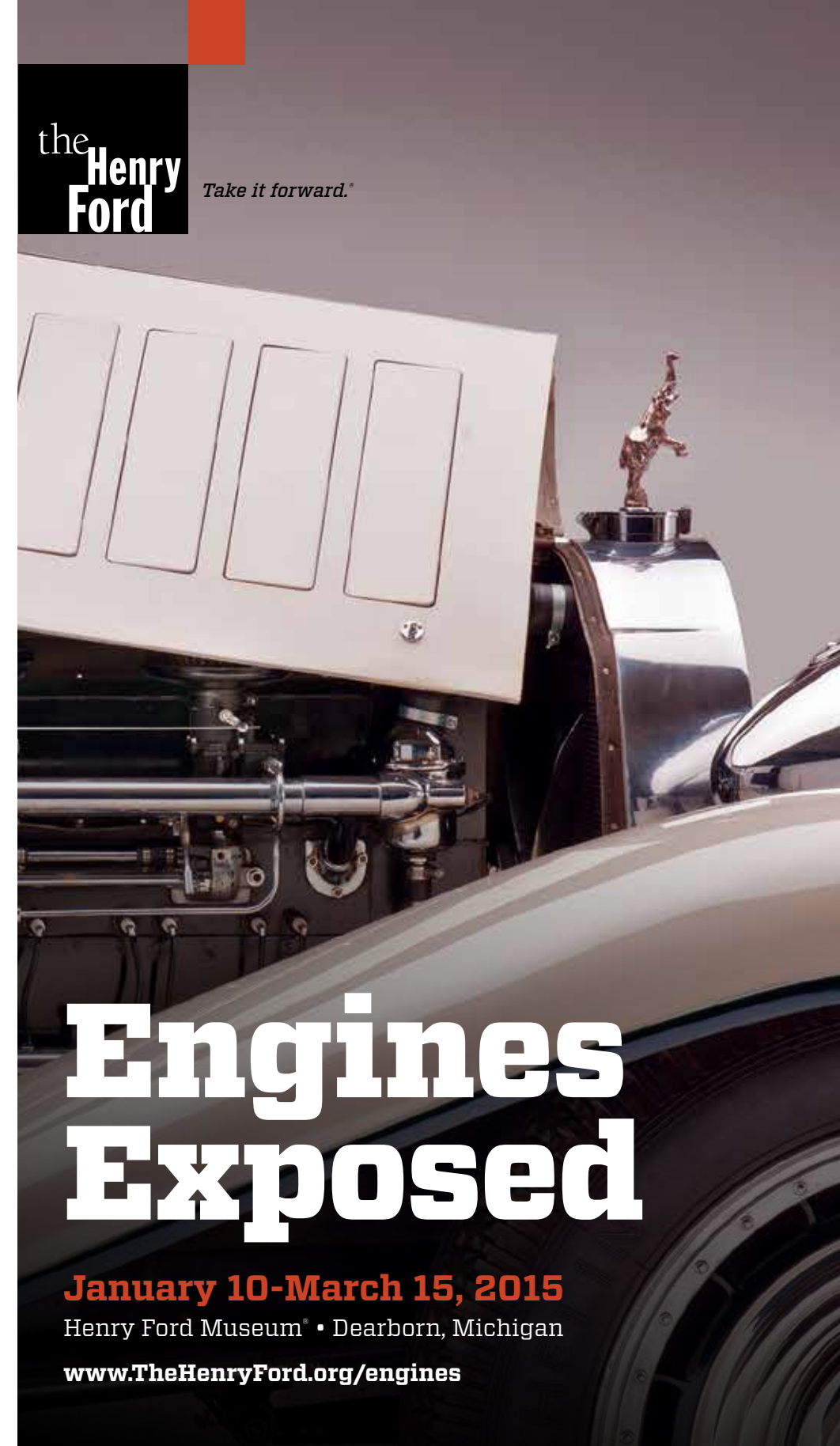
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Ford Rouge Factory Tour Sweepstakes

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Engines Exposed

January 10-March 15, 2015

Henry Ford Museum • Dearborn, Michigan

www.TheHenryFord.org/engines

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