

ENGINES EXPOSED HIGHLIGHTS

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®*. For the first time ever, more than 50 cars have their engines exposed for you.

Here, Bob Casey, curator of transportation at *The Henry Ford®* describes some of his favorites.

1 1919 FORD MODEL T
 Inline 4-cylinder engine, L-head valves,
 176.7 cubic inches displacement, 20 horsepower

1919 was the first year Model Ts were available with electric start. The starter motor is just visible at the rear of the engine, below the slanting steering column. Pipes carry cooling water from the bottom of the radiator to the side of the engine and from the top of the engine back to the radiator. Fords had no water pump, depending on a thermosiphon effect to circulate cooling water.

2 1960 CHEVROLET CORVAIR
 Horizontally opposed 6-cylinder engine, overhead valves,
 140 cubic inches displacement, 80 horsepower

With its engine in the rear, the Corvaire caused a good bit of head scratching among garage mechanics in 1960. The most noticeable item under the Corvaire's hood is the large round air cleaner, with pipes leading to each of the two carburetors. Most of the flat, air-cooled engine is hidden by a metal shroud that directed the air flow around the engine.

3 1949 VOLKSWAGEN
 Horizontally opposed 4-cylinder engine, overhead valves,
 69 cubic inches displacement, 25 horsepower

Shaped like an insect, the Volkswagen prompted people to look at automobiles in a new way. The hood was at the wrong end, and when you opened it you found an engine that was flat instead of vertical, had a big cooling fan instead of a radiator and had a carburetor air cleaner that looked like a juice can.

4 1943 WILLYS JEEP
 Inline 4-cylinder engine, L-head valves,
 134.2 cubic inches displacement, 54 horsepower

The Jeep is practicality personified. Important items like the fuel filter (at the right rear corner of the engine compartment), the voltage regulator (rectangular box in front of the fuel filter), oil filter (round can with conical top), air filter (round can to the rear of the oil filter) and carburetor (at the end of the round pipe extending from the air filter) are all within easy reach for convenient servicing.

5 1923 "COPPER COOLED" CHEVROLET
 Inline 4-cylinder engine, overhead valves,
 134.7 cubic inches displacement, 22 horsepower

Engineer Charles Kettering believed air-cooled engines could be lighter and simpler than ones cooled by water. He devised a way of brazing copper cooling fins to cast-iron cylinders. He wrapped the engine in a metal shroud and used a fan to pull air up past the fins and out through the grille and hood louvers. Unfortunately, the "Copper Cooled" engine did not work as planned, and the idea was abandoned.

6 1931 DUESENBERG MODEL J
 Inline 8-cylinder engine, double overhead camshaft,
 420 cubic inches displacement, 265 horsepower

The Duesenberg looks as good on the inside as on the outside. Bright aluminum camshaft covers, intake manifold, timing chain cover and firewall contrast nicely with the dark green paint on the engine and its accessories. But beauty has its practical side: all that aluminum lowers the car's weight, helping make the Duesenberg one of the hottest cars of its day.

7 1933 WILLYS "GASSER" DRAG RACING CAR
 V8-cylinder engine, supercharged, single overhead camshaft,
 427 cubic inches displacement, 900+ horsepower

Ford developed this monster motor for stock car racing, but NASCAR outlawed it, so most of the engines went to drag racers. Atop the engine is a supercharger that pumps a pressurized fuel-air mixture to the cylinders. Car builder George Montgomery designed the supercharger and had it manufactured out of magnesium.

8 1967 FORD MARK IV LE MANS RACE CAR
 V8-cylinder engine, overhead valves,
 427 cubic inches displacement, 530 horsepower

Ford designed this engine to win 500-mile stock car races, but it proved just as adept at winning 24-hour sports car races. The twin carburetors are surrounded by a sealed box that received air from scoops on the rear body panel. The spare tire was required by the rules, but was never used in the race. The rectangular aluminum box was the luggage compartment, also required by the rules.

9 1956 CHRYSLER 300B RACING STOCK CAR
 V8-cylinder engine, overhead valves,
 352 cubic inches displacement, 355 horsepower

This is the engine that dominated NASCAR in 1956. Unlike today, the rules allowed two four-barrel carburetors. Notice that the right wheel well is cut away and a spotlight is installed, allowing the driver to monitor tire wear by looking through a hole in the firewall. Notice also the bungee cord to insure that the hood stays closed at high speed.

10 1964 CHRYSLER TURBINE
 Regenerative gas turbine engine, 130 horsepower

You are looking at a future that never arrived. Chrysler experimented with gas turbines for some 25 years but never put them into production. This version of the turbine engine looks more like a home heating boiler than an automotive power plant. In front of the engine is the massive air filter housing that satisfied the turbine's demand for large amounts of very clean air.

11 1960 BOWES SEAL FAST SPECIAL RACE CAR
 Inline 4-cylinder engine, double overhead camshaft,
 255 cubic inches displacement, 400 horsepower

This is the most famous American racing engine of all time, the 4-cylinder Offenhauser, or "Offy" for short. Made largely of aluminum, the light, powerful Offy propelled 17 different drivers to 26 national championships. The trumpet-shaped pipes on the left side of the engine feed air to the fuel injectors. Rubber baseballs stuffed in the trumpets keep out dirt when the engine is not running.

12 1924 DOBLE MODEL E
 Inline 4-cylinder, double-acting compound steam engine with condenser,
 125 horsepower

The Doble is a steam car, so the boiler, not the engine, is under the hood. The trumpet-shaped burner at the top of the rear of the boiler heated water running through 575 feet of tightly coiled steel tubing inside the boiler. Steam flowed from the boiler to the engine, to the top of the radiator, where it was condensed back into water to be boiled again. And where is the engine? Under the car, directly connected to the rear axle.

13 1932 FORD HOT ROD
 V8-cylinder engine, overhead valves,
 331 cubic inches displacement, 180 horsepower

The builder of this car used one of the hottest engines available in the early 1950s, a Chrysler V8 with hemispherical combustion chambers. It was powerful enough that he made only one significant change: adding custom-made exhaust headers. The speckled paint on the underside of the hood was called Zolatone and was quite popular with hot rodders at the time.

14 1931 BUGATTI TYPE 41 ROYALE
 Inline 8-cylinder engine, single overhead camshaft,
 779 cubic inches displacement, 300 horsepower

The Royale's exhaust manifold is covered by a pair of L-shaped aluminum heat shields. Peeking up above the top of the engine are the air cleaners for the four carburetors installed by Charles Chayne, who restored the car after World War II. These replaced the single large carburetor originally installed. Also visible at the rear of the engine is the distributor with sixteen spark plug wires, two for each of the eight cylinders.

15 1965 GOLDENROD LAND SPEED RECORD CAR
 Four V8-cylinder engines, overhead valves,
 426 cubic inches displacement each,
 600 horsepower each

Yeah, it's got a HEMI — actually, four of them. Squeezing four of Chrysler's huge HEMI engines, plus all the mechanism for four-wheel drive, into a car this slim and low was no easy trick. Special low-profile fuel injectors had to be made to keep everything below the 28-inch-high hood line.

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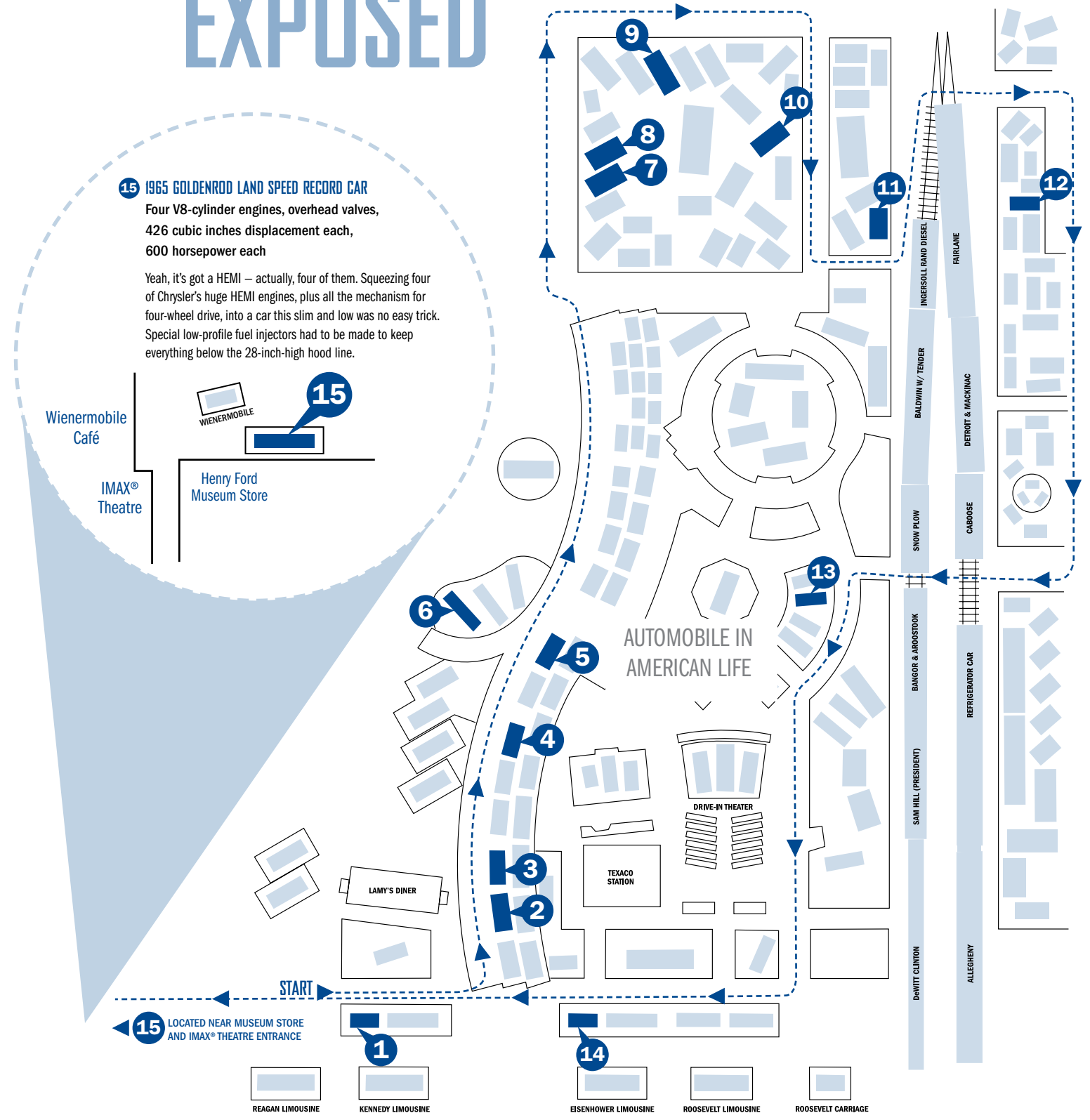
EISENHOWER LIMOUSINE

ROOSEVELT LIMOUSINE

ROOSEVELT CARRIAGE

ENGINES EXPOSED

HIGHLIGHT MAP



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1931 SLANT WINDSHIELD TOWN SEDAN 20 MILLIONTH FORD

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205 cubic inches displacement, 40 horsepower

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V8-cylinder engine, single overhead camshaft,
5.4-liter displacement, 320 horsepower

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