

# HENRY'S LEGACY

The Unconventional Story of the

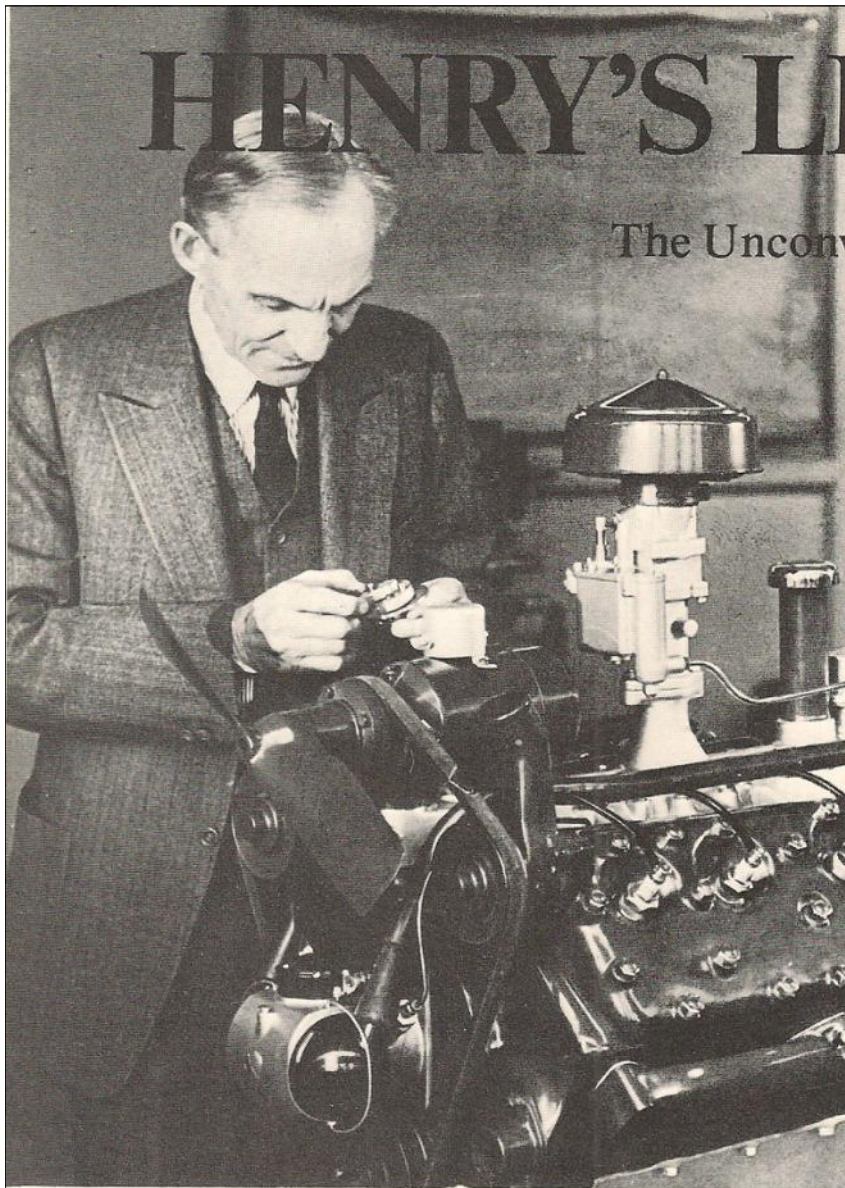
## FORD V-8

*by*

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Los Angeles

*photo courtesy of  
the  
FORD ARCHIVES*



**M**OST DYED-IN-THE-WOOL V-8 enthusiasts—regardless of what year Ford they own—are pretty well acquainted with the facts behind the development of the V-8 engine. Ford Motor Company, the story goes, was locked in a fierce battle for sales with arch-rival Chevrolet. After intensive urging, Edsel Ford reluctantly persuaded his father to retire the Model T in favor of a car with more refinement and popular appeal. Chevrolet's answer to the Model A was its 1929 offering—a car bringing the power and smoothness of a six-cylinder engine to the low price market. Jolted by sales lost to its more glamorous competitor and to the upstart new Plymouth, Ford made a bold and sweeping decision—recapture the low priced automotive market once and for all by introducing a V-8 engine, heretofore thought too complex and expensive for all but the most luxurious automobiles.

All this is true, of course, but there's more to the story than Henry Ford trying to outfox his competition. An understanding of the development of the Ford V-8 would be impossible without delving into the social, economic and technological forces which combined to produce it.

The Story begins several years before World War One, when a number of European auto firms—particularly DeDion—experimented with a few prototype V-8s. None seem to have been much of a success. Meanwhile in America, Henry Leland, engineer *par excellence* with Cadillac, was noticeably unimpressed with the straight six the company had designed to replace its tried and true four cylinder motor. His chief complaint seems to have been the long and potentially troublesome crankshaft the new engine would have required. Leland, who had read of the European experiments, decided that a properly designed V-8 engine would be a better choice for the Cadillac than the new six. This was in the summer of 1913. During the next year and a half, Leland designed and guided into production a new V-8 that was technically superior—as well as 50 pounds lighter—than the four banger it replaced. It was introduced in the company's 1915 model, successful from the start. Incidentally, Leland some years earlier helped develop the first practical electric starter for a motorcar—an item that millions of Henry Ford's customers would have been happy to purchase as an accessory. During the War,

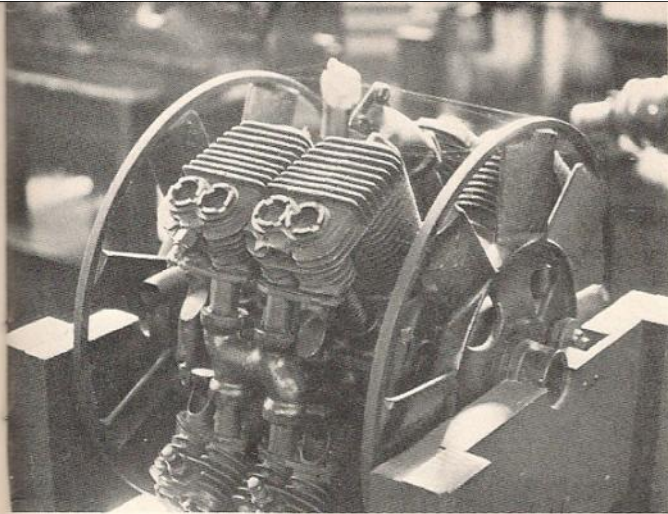


Fig. 1—Prototype X-8 engine on display at the Henry Ford Museum, Dearborn. This engine proved too heavy for the Model T chassis, although it ran fine when placed in an Oldsmobile. Photo by Charles Seims.

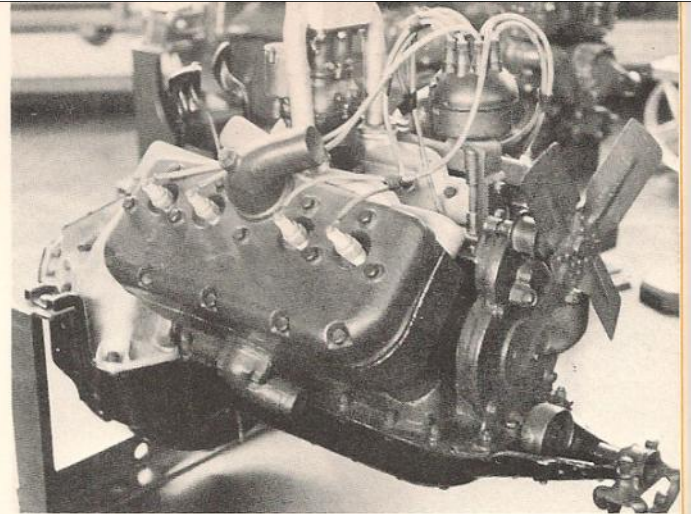


Fig. 2—Ford's first V-8 engine, designed for the Model T. Note the welded-up intake manifold. At the Henry Ford Museum, Dearborn. Photo by Charles Seims.

after a dispute with General Motors management, Leland resigned to build aircraft engines and founded the Lincoln Motor Car Company with his son Wilfred. Although they were fine cars, the Leland Lincolns failed to win their share of the prestige market, and the company was purchased at a bankrupt auction in 1922 for eight million dollars by Henry Ford.

A number of other manufacturers, notably General Motors affiliates, flirted with a V-8. Chevrolet had it for a while in the late 'teens, as did Oakland, forerunner to the Pontiac, ten or twelve years later.

Meanwhile, Henry Ford's flivver mill kept turning out Model Ts at a prodigious rate. Part of the Ford legend holds that the company led the world with its innovative manufacturing. Such simplicity belies the truth, as Henry Ford was often as not the source of his own legend. On several occasions the manufacturer vociferously proclaimed his company preferred not to patent its inventions, regarding them instead as gifts to the public domain. But the Ford Motor Company's greatest contribution to the industrial development of America clearly lay in the production methods the company pioneered, not in the superiority of the product that it turned out. This was particularly true in the Model T days. As Keith Sward, one of Ford's most perceptive biographers, has put it: "The Model T, frozen for eighteen years, had almost nothing to offer, at least in its later years, to the arts of automotive design."

Although T sales were phenomenal—half the cars on the road in 1920 were Fords—an increasingly sophisticated buying public considered an automobile's comfort and convenience as important or more so than a low price. This was the message a national convention of Ford dealers brought to Detroit in 1922 when as a body they pleaded with Ford to update his heretofore virtually changeless model. Ford acted surprised, turning a deaf ear.

And yet modernization experiments did occur, albeit on a small scale. Around 1925, Ford engineers experimented with a revolutionary new eight-cylinder powerplant for the Model T. This was the famous X-8 engine, which had its pistons arranged every 45° around a complete circle (see Figure 1). The project was abandoned because the new engine was too heavy for the T chassis and had lubrication problems.

A more conventional design was embodied in a V-8 engine light enough to fit the Model T frame and transmission. Almost nothing is known about this engine, and only speculation places it in time slightly after the X-8—late 1925 or 1926—when Ford engineers still thought in terms of an upgraded Model T as a means to recapture lost sales. One version of the radial engine and this earliest of Ford V-8s (Figure 2) are on display at the Henry Ford Museum in Dearborn.

Changes to the Model T did come, but they were too late and too few to recapture Ford's flagging engineering leadership. True, the more colorful and sleeker flivver of 1926 outsold the Chevrolet by a margin of two to one. But a scant five years before, it had bested its nearest rival six to one. Charles Sorensen, Ford's hardboiled production chief, confided in his autobiography that he was "sick of seeing" Model Ts.

Henry Ford finally got sick of them too, abruptly discontinuing the car in May of 1927 after over 15,000,000 had been made. His stubbornness is apparent in not only latently admitting the T's obsolescence, but in failing to make adequate plans for its successor. At the time, only the most preliminary work had been done on the design of the new Model A. Henry wasted six months thinking things over.

The most immediate effect of the changeover was that 60,000 men who had been on Ford's production lines were suddenly thrown out of work. Their layoff was understandable in view of the Herculean tasks attendant with producing a new automobile for mass production from scratch. Of the 40,000 or so machine tools connected with the production of the Model T, 15,000 had to be completely scrapped, and 25,000 more extensively modified for the new car. All this was said to cost in excess of a quarter billion dollars. But it did nothing to endear Henry Ford to the hearts of his idled workers, who usually had nowhere to go except on public relief.

There were other effects as well. Many potential buyers, unable to obtain a Ford, simply switched over to a competing make, particularly Chevrolet. Walter P. Chrysler, an ex-General Motors executive, had been watching the situation carefully. He left GM a few years earlier to found his own company; and his product—named after himself—was a worthy entry in the medium price field, selling well. It gave Walter Chrysler the work-

ing capital and desire to enter the high-volume, low priced automotive market. What Chrysler lacked was the capacity to mass produce the required parts on a quantity basis. In particular, his company lacked foundry capability. These problems were solved in May 1927, when Chrysler purchased the ailing Dodge Brothers organization for \$225,000,000—mostly in stock options. The new company's initial offering—the Plymouth—was immediately a threat to both Ford and GM. Chrysler was so pleased with his new model that the third one off the assembly line was presented as a gift to Henry Ford—perhaps as a token of deference to Ford's acknowledged but declining leadership in the auto industry. When Henry inspected his new Plymouth he spoke disparagingly of its many engineering refinements. Still, 23,000 of them were sold in 1928.

No one was more dissatisfied with Ford's sudden discontinuance of the Model T than his dealer organization. From May 1927 until the first Model As began trickling to dealers after the car's introduction at the New York Auto Show in early 1928—virtually a year later—Ford dealers had nothing to sell except used cars, parts and service for Ts. Many rebelled at this, switching allegiance to other makes. One Chrysler executive boasted he was able to hire the very best former Ford salesmen, leaving the not-so-successful ones to seek work elsewhere.

The Model A was a fine car, but faced some stiff competition. Ford's plan to make his new auto a long running success like the T failed to take into account that General Motors had created in the buying public a demand for annual model changes. They had refrained from introducing the six-cylinder Chevrolet until the Model A hit the market, but sprung the trap in 1929. Ford sales held their own that year but declined drastically afterward. For perhaps the first time in his life, Henry Ford was unable to play by his own rules. "I don't know how many cars Chevrolet sold last year. I don't know how many they're selling this year. I don't know how many they may sell next year. And—I don't care," he thundered at a reporter from *Fortune* magazine. But he did.

This time, the old man was determined to get the drop on his competition. Introducing a six of his own would be tantamount to admitting Chevrolet's engineering leadership. Besides, Henry Ford had no more use for six cylinder engines than did Henry Leland. A twelve cylinder was also out of the question—such engines were



Fig. 3—The Fort Myers Lab, birthplace of the V-8 engine. Photo by Charles Seims.



Fig. 4—Interior of the Fort Myers Lab. This humble setting seems hardly capable of producing a major technological development. Photo by Charles Seims.

confined to the most ponderous of automobiles—and Ford detested excess weight. A V-8 was the logical choice—it could be made short, small and light—if it could be made at all. Ford planned to retain the four for those customers unreceptive to the concept of a high performance engine in a low priced car.

One day late in 1929, the elder Ford wandered up to the desk of Fred Thoms, in the Engineering Department. "We're going from a four to an eight because the Chevrolet is going to a six," he remarked. "Now, you try to get all the eight cylinder engines that you can."

Thoms embarked on a tour of nearby wrecking yards, garnering nine engines. One feature they all had in common was multiple castings for separate banks of cylinders, bolted together. Ford decided that his new engine would be cast *en bloc*. His engineers said it couldn't be done. Ford replied it would.

From the Project's very inception, secrecy was the watchword. Had not Ford himself once said, "Our best advertising is free advertising"? He well knew the magical effect that studied silence had on a curious public—as when he kept the details of the Model A swaddled in secrecy and saw record crowds of ten million near-riotous onlookers jam showrooms on the day of its introduction. Accordingly, the old man decided that Greenfield Village, his one-man amusement park then being built in Dearborn, would allow the V-8 engineers to work uninterrupted and unwatched. For their headquarters they were given one of Thomas Edison's old laboratories that Ford had just moved in from Fort Myers, Florida (Figures 3 & 4). Facilities here were poor—even worse than in Ford's regular Engineering Laboratory.\*

By the end of 1930, several prototype unit-casting V-8s had been hand fabricated and installed in Model A cars

\*Henry Ford's cantankerous personality often hindered the very projects for which he cared the most. He was said to have equipped his engineers with desks, but no chairs, so they would be unable to loaf or sit down on the job. Of the Engineering Laboratory an employee later wrote: "There was a lack of depth in engineering ability in plant engineering, production engineering, and advanced engineering. There was no advanced planning as far as I can understand. When we'd compare it with the engineering department of other automobile plants, we didn't have an engineering department." All this may be symbolic of the corporate stagnation that occurred during the late Model T years.

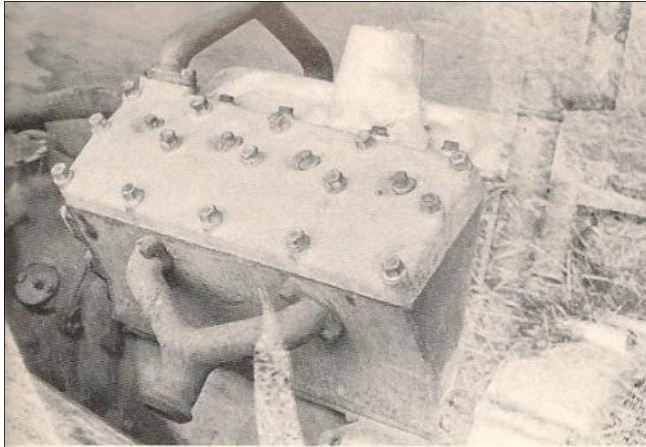


Fig. 5—One of the earliest prototype V-8 engines, dating from 1930. This engine was probably used for dynamometer tests only. Photographed by telephoto lens through the window of the "Sugar Mill" at Greenfield Village, where a number of prototype Ford engines are stored. Photo by Charles Seims.

for testing (Figure 5). Edison, Ford's longtime friend and former employer, was allowed a test drive in one of them. His comments on the matter were not recorded, but speculation ran rampant that the new car would be named in his honor. By this time both the trade press and newspapers knew of Ford's V-8.

Research and development on the "improved Model A" proceeded slowly all through the next year, 1931. Ford had yet to give his final approval to the V-8 engine. His engineers had developed a chassis and a refined four cylinder motor to go in it. The new frame was designed to accept the planned V-8 as well. Sales of the Model A fell to a disappointing half a million, and when the last 1931 model came off the assembly line, no one, not even Henry Ford, was quite sure what would replace it. Motor production for the four cylinder Model B car began on November 29th.

On December 7, after viewing a number of advanced prototypes (Figures 6 & 7), Henry and Edsel decided to go ahead with the production V-8. "From that moment," wrote Ford's favorite journalist, James Sweinhart, "Henry Ford personally became the dynamo of the works. He was here, there, everywhere, ordering, directing, changing."

Engineering difficulties had largely been solved with

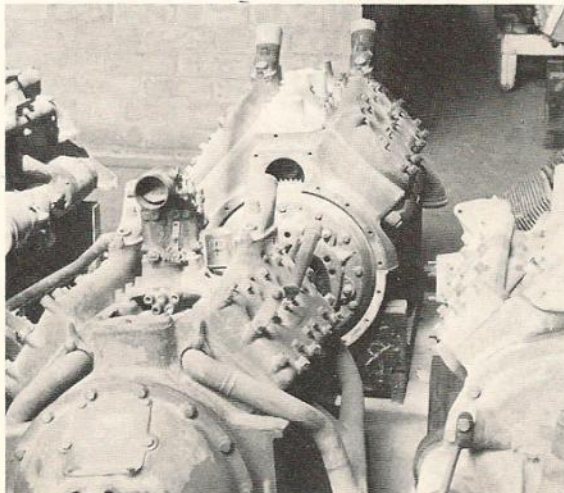


Fig. 7—(top center). Either the same engine as in Fig. 6, or one similar to it. However, the heads on this engine lack the "bumps." Photographed at the Sugar Mill, Dearborn. Photo by Charles Seims.

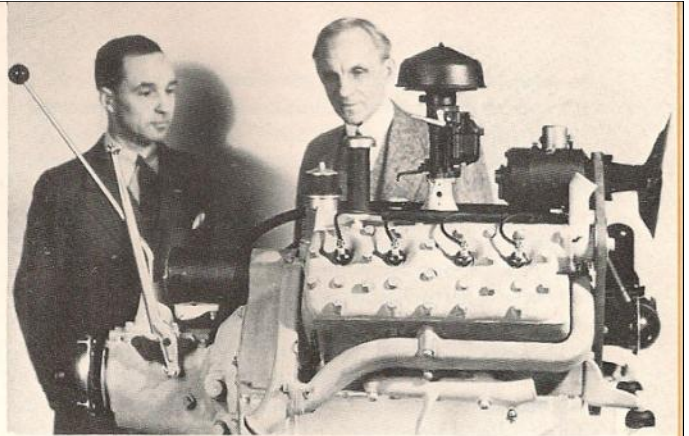


Fig. 6—Henry and Edsel look over a more advanced prototype engine sometime in 1931. Unique bell-housing and manifold system are the major differences between this and later models. Note the four extra casting "bumps" on the head. Ford Archives Photo.

the engine's design, but production problems were staggering. Large as it was, the Ford Motor Company was entirely inadequate to market such a revolutionary new automobile without a great deal of outside support. Many subassemblies of the new car—the ignition, carburetion, fuel supply, suspension—were thrown in the lap of outside suppliers to design and produce as best they could. Bodies were mostly ordered in made-up form from the Briggs Manufacturing Company—purchased completely trimmed for \$120-140 apiece. In 1929, Ford had purchased parts from a total of 2200 subcontractors. Now, three years later, this total had nearly tripled.

In his autobiography, Charles Sorenson has left an interesting account of the difficulties encountered producing the V-8:

With the first hint of building a V-8 engine, I sensed that many prior operating notions would have to be set aside. New methods with closer tolerance on dimensions would demand new tools and machines.

The first major problem was a unit casting. All previous V-8s had been cast in more than one piece. What we proposed to do was cast a V-8 in a single, solid, rigid block.

We studied every move in the molding operation and mechanized its handling. The sand for each mold was shot into flasks from overhead chutes. Pattern and mold were then vibrated with a raise and drop movement which packed the prepared sand. This did away with all the sand handling by shovel, and heavy pounding of the sand by hand was eliminated.

A mechanical lifting device raised the finished molds from machine to conveyor which took them to a point where the cores, fresh from the vertical tower ovens, were brought by conveyor and set in place. At a steady pace of 100 molds an hour, the assembled mold was conveyed to an iron-pouring line.

Pouring iron into a moving mold was a spectacular affair as well as a new and original method. A pouring furnace containing two tons of melted iron moved alongside the conveyor at the same speed. Its pouring spout was tilted into the mold, and the iron ran in and filled the mold. The moving furnace was fed from a nearby 20-ton electrical furnace in which the iron analysis

could be controlled by alloy additions . . .

Cooling of the casting after pouring was important in order to control hardness and cracking. These controls produced a casting that went through the machine operations with added life to the cutters in the milling machines, drills, and reamers. The speed of all operations was stepped up. This, of course, showed the need of new machinery to meet this casting development.

Improved cutting steels that could handle higher speeds added to the new development. The solid, rigid, single V-8 casting could now stand any load that machines could put on it.

So far as Ford Motor Company was concerned, the casting of a unit block was the real factor in the engine's success. We produced the finished block for less per pound than our previous cost.

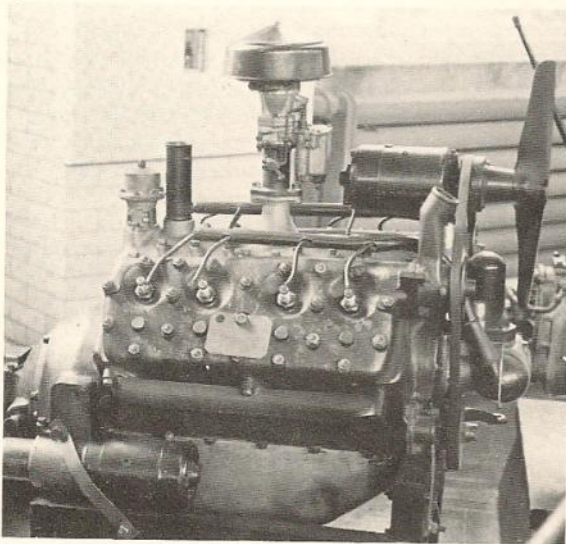


Fig. 8—Probably the first production V-8 engine, at the Henry Ford Museum, Dearborn. This carries serial number #18-1, and a host of small details distinguishes it from later production versions. Note the bumps on the head again. This is probably the same engine as in Fig. 12. Photo by Charles Seims.



Fig. 9—Charles Sorensen shows Henry Ford where to stamp #18-1 on the first production engine. Even with his glasses, Ford struck the "8" upside down! A few minutes later, this chassis was assembled into a Victoria. This engine may have been removed and sent to the Henry Ford Museum, but it is also possible there was more than one number one engine. Ford Archives Photo.

Revolutionary as they were, these exciting technological developments were paid for elsewhere in human suffering and misery. The Depression hit Detroit as hard as any place in the United States—that city went bankrupt in 1931 and was responsible for 70 per cent of Michigan's total unemployment. About half of its citizens were receiving some form of public assistance at the beginning of 1932. And after the cessation of Model A production, 14 per cent of those on relief in Detroit were former employees of the Ford Motor Company. Ford's employment—or rather unemployment—practices were widely criticized in the press. One financial journal accused the manufacturer of creating "a depression within a depression."

These facts were not lost on the Detroit chapter of the Communist Party. They were anxious to organize a demonstration that would call attention to the very real plight of the Detroit auto worker—and to themselves in the process. The Communists chose Ford as their target. At this time, 50,000 to 60,000 Ford employees were out of work at the Rouge Plant alone.

A parade permit for March 7th was sought and granted by the city of Detroit. Dearborn, a separate municipality completely under the political control of its largest employer, was a different story. Its police chief, Carl Brooks, was a former Ford plant guard said by Upton Sinclair to have received two separate salaries for his work—one from the city and one from Ford. Brooks said no to the Communists.

The leaders of the Ford Hunger March planned to parade to the gates of the Rouge plant and distribute handbills in defiance of the chief. There would be no

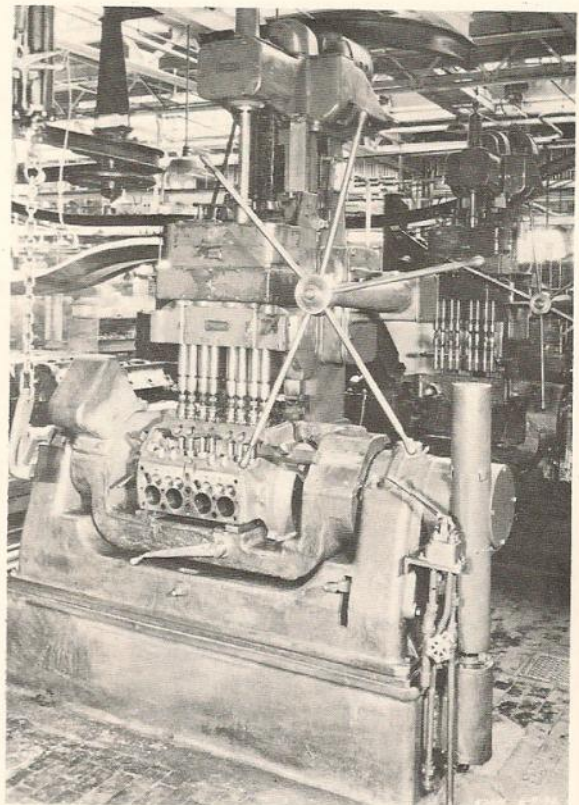


Fig. 10—One of the many specialized machines that were designed for V-8 engine production. This one chamfered the valve seats eight at a time. Ford Archives Photo.

violence, they said, just peaceful picketing. This was the case until the group of several thousand Hunger Marchers reached the Rouge. Most, of course, were not Communists, just sympathetic to Ford's alleged labor malpractices. They found the plant gates locked, and behind them were a thousand or so of Ford's hated private police. The guards reacted to taunts from the crowd by turning several high-pressure fire hoses on the freezing and unarmed marchers. Just about this time, Charles Sorenson and Harry Bennett drove up to a main gate from inside the factory. As soon as Bennett—the hated head of Ford's private police force—alighted from the car he was recognized by one of the drenched marchers. A well-aimed rock flew over the fence, striking Bennett on the forehead, knocking him to the ground. When the Ford guards saw their leader thus disabled, they drew their guns and fired indiscriminately into the crowd. Several dozen marchers were hit, and four lay dead.

These tragic events made headlines nationally—Ford and the Dearborn police being universally criticized. Henry himself remained silent about the incident, hoping that the introduction of the V-8 would be so spectacular that the public would forget about the killings. But as March 30—the day of the planned introduction—approached, it became painfully aware that Ford had as of yet little to sell. By that date, only 1050 V-8 engines had been cast, and many of these had yet to be assembled into cars.

Ford's plans were to introduce the car to his dealers a day ahead of the public. On March 29 they gathered at Ford assembly plants around the country. Only a few, however, were lucky enough to see a finished V-8. The rest had to be content with watching a 22 minute movie accompanied by a phonograph spiel that the factory had prepared detailing the mechanical features of the new car.

The dealers—whether they saw the car in person or not—were ecstatic. Certainly the V-8 was the most novel and exciting addition to the automobile in many years. But more than this, they were grateful having a new car to sell again, after a six month delay. It is reported on good authority that over a thousand Ford dealers either went bankrupt or switched to other makes while waiting for the V-8.

Chrysler and General Motors had waited for it too. They and a host of other low-priced automobile makers had virtually suspended their own production until the V-8 appeared. Chevrolet responded by immediately dropping the price of all its models an average of \$50 per car. Walter Chrysler embarked on a frenzied advertising campaign exhorting potential buyers to see the new Plymouth before making a decision. "It is my opinion," he philosophized, "that any car without Floating Power is obsolete."

It was a lucky Ford dealer who was able to display a new V-8 in his showroom. Initial production was very slow due to poor planning and a host of unforeseen difficulties. Only 1220 V-8s were assembled in March, 7134 in April, 23,760 in May. Gradually, however, they began trickling out into the hands of dealers. Many stopped here, being held in the showroom for display purposes. Those with political clout—judges, governors, movie stars—were able to get one, but the average citizen would have to wait. Four cylinder cars were readily available at \$50 less, but were indifferently received by the public. After several months, frantic directives poured out of Dearborn instructing salesmen to go door to door in an attempt to unload the unpopular Model Bs.

As deliveries of the V-8 began, so did a steady stream of mail into Ford offices, complaints about mechanical malfunctions of the new cars. This was not unusual, in view of the fact that the 1932 Ford was virtually untested

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