

OFF-HIGHWAY HEROES

Diesel's engine

Fame doesn't always include fortune.

By Chad Elmore

The power of steam drove the industrial revolution throughout Germany during the 1800s. While it was an improvement over wind or water power, the external combustion engine was largely inefficient, expensive and better suited for large-scale operations. It made mass production possible while threatening the livelihood of the country's skilled craftsmen.

Rudolf Diesel, born in 1858, graduated from technical college as an engineer and set out to relax steam's grasp on society. He also desired the fame and fortune that would follow such an important invention. Diesel believed he had a solution in a compression-ignition engine that could run on a variety of low-priced fuels (Diesel first tried coal dust). In 1892, Diesel emphasized his engine's relatively small stature and the fact that it could make artisans competitive regardless of where they worked.

"In this way a decentralization of craft industry is possible," Diesel wrote (quoted in Donald E. Thomas' book *Diesel: Technology and Society during the German Industrial Revolution*), "instead of its accumulation and concentration in large cities. Such a process would involve political, economic, and hygienic advantages."

Between 1883 and 1889 he worked on an ammonia vapor engine. While this proved unsatisfactory, Diesel was on the path to the engine that would carry his name.

Years later, Rudolf Diesel called the invention process a happy time. For him, this was the early 1890s. "One must desire a lot in order to reach anything . . . invention means guiding a correct idea," he wrote, "which has been sifted out from a large group of erroneous ideas, through numerous failures and compromises to practical success. For that reason, every inventor must be an optimist."

Diesel worked on the theory of his compression engine during 1890-'92. Even as he was studying the concept and attempting to complete a working model, Diesel was peddling licenses to manufacturers throughout Europe. Among the first to sign were German steam engine manufacturers Maschinenfabrik Augsburg and Essen-based manufacturer Friedrich Krupp. Diesel, Krupp and Augsburg soon collaborated on the construction of an engine.

In 1897 Diesel's third engine was operating in the Augsburg plant, and it proved

the concept was sound. Those involved were eager to recoup their investment, and went to market.

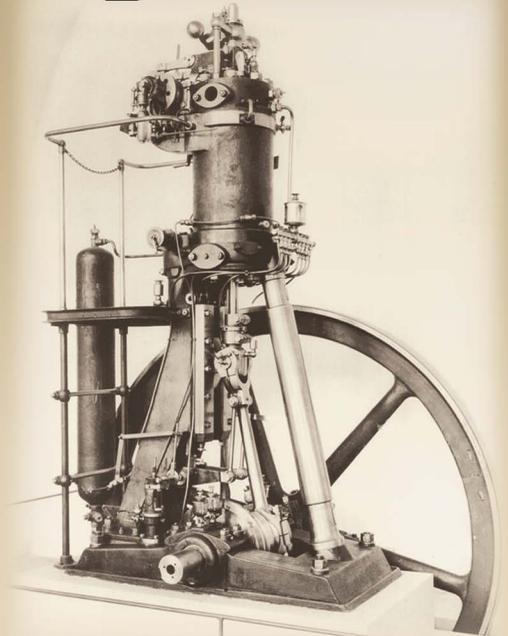
Diesel's compression-ignition engine caught the attention of many. Adolphus Busch, whose breweries had made him a fortune in St. Louis, sent an engineer to Germany. He returned with a favorable report. The engine could be used in Busch's breweries, and Busch saw a business opportunity as well.

With Busch and others developing and marketing the engines, they began finding their way into factories. Unfortunately, they were often sold at a loss and were trouble-prone once installed. The engine's potential remained clear in spite of the problems. In 1899 a submarine builder noted that the two steam engines he wanted to use in his craft would literally cook the human crew, and looked into using a diesel engine. After some research the dangers associated with diesel engines were considered too great. There was much work left to be done on the engine. It would be several years before the internal combustion process would be fully understood.

Interest also came from Alexander Winton, a Cleveland-based entrepreneur who made his fortune in bicycles and automobiles. Winton liked the engine for marine applications. In 1913, Winton built what has been considered the first all-American diesel engine. During World War II engines built by Winton's firm (by then owned by General Motors) propelled many allied submarines and other craft. Busch was present in the war effort as well, as Busch-Sulzer engines were found in vessels such as minesweepers and tugboats.

When Diesel's 1897 engine was unveiled to the world, he was heralded as a successful inventor and became the center of an international licensing and patent network. His hard work was paying off — the engine's potential made him a wealthy man.

But disaster had also walked through the open door, and the decline of Diesel's fortune came almost as fast as its summit. Diesel quickly sold patent rights and licenses in order to get the most out of his engine, but never sought the backing he needed to perfect his creation on his own. Customers returned their engines and manufacturers cancelled their licenses. Diesel's health had suffered for years.



Generally regarded to be the first diesel engine, Diesel's third prototype was shown in 1897. Although it proved Diesel's theories, the engine was far from marketable at this point. Hindsight has always been 20-20.

The fact that he was engaged in many battles to protect his patents and his name wasn't helping.

By fall 1898, the engineer was on the verge of collapse and was unable to work on the engine for several months. Fearing he would not survive, Diesel helped start a company to control the patents. Diesel was on its board until 1906.

Diesel's greatest accomplishment was behind him. It was up to engineers at manufacturers such as MAN (formed in 1908 through the merger of Maschinenfabrik Augsburg and Maschinenfabrik Nurnberg) to drive the diesel engine to the next level. With ongoing development work the engine was not only improving but the number of its applications were found to be far greater than a factory powerplant: rail, farm, even cars and trucks were possibilities.

Rudolf Diesel found himself listed among the greatest inventors of the time, but this did not translate into great wealth. He was on the verge of bankruptcy and fighting depression. In 1913, he boarded a cross-channel steamer to speak at a meeting of the Royal Automobile Club in London. That night, somewhere in the North Sea, the inventor slipped overboard and was never heard from again.

While Diesel's business acumen has been questioned, his failure is perhaps more indicative of the changing times. As Thomas says in his 1987 book, Diesel's story "points up the often difficult transition from developed invention to marketable product as technology become more complex."

Although Diesel could never have lived to see it, the fact that the diesel engine dominates an industry that helps skilled operators make a living in every region of the world would surely make him proud.