

100 YEARS OF INNOVATIONS VOLVO PENTA 1907-2007





PENTA



RACER- MOTOR

TYP I.-2
15-20 HK

*Högeffektiv
Ökonomisk*



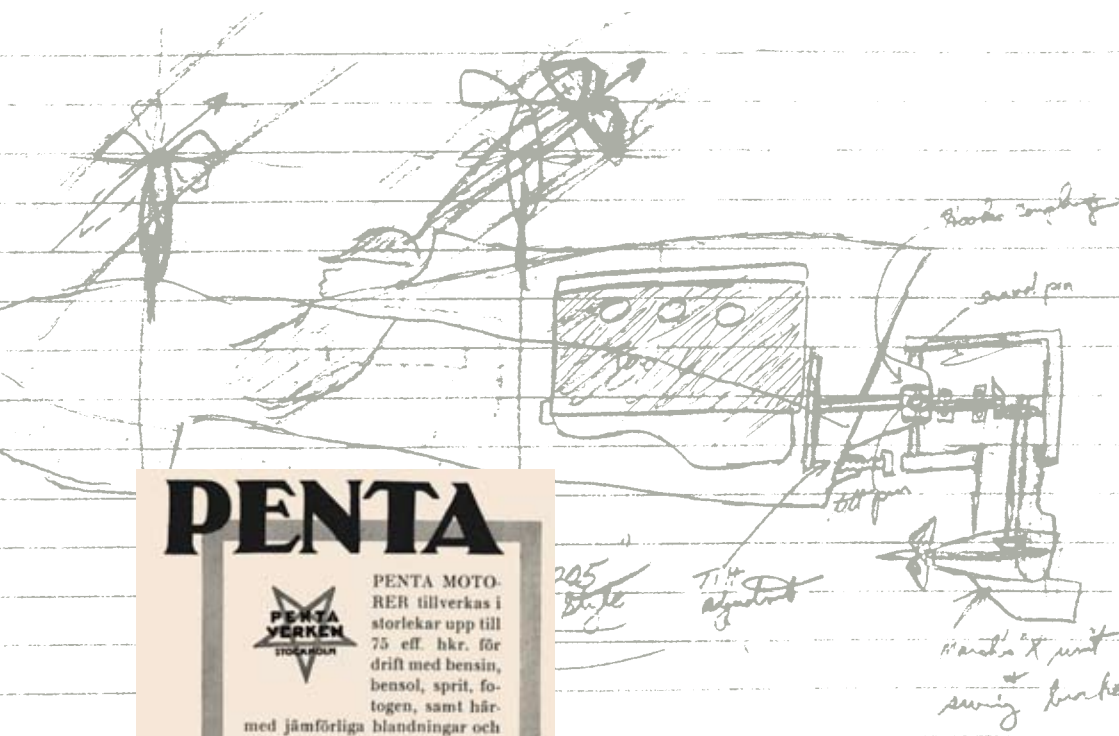
AKTIEBOLAGET PENTAVERKEN, SKÖVDE

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100 YEARS OF INNOVATIONS



PENTA



PENTA MOTORER tillverkas i storlekar upp till 75 eff. hkr. för drift med bensin, bensol, sprit, fotogen, samt här-

med jämförliga blandningar och destillat, och komma till användning för marina och stationära ändamål, samt i kombinationer som motordynamor, motorvinschar, motorsprutor, motorplogar, motorvältar etc.

Aktiebolaget

PENTAVERKEN

Stockholm 1

Telegramadress PENTA.

1907-1919

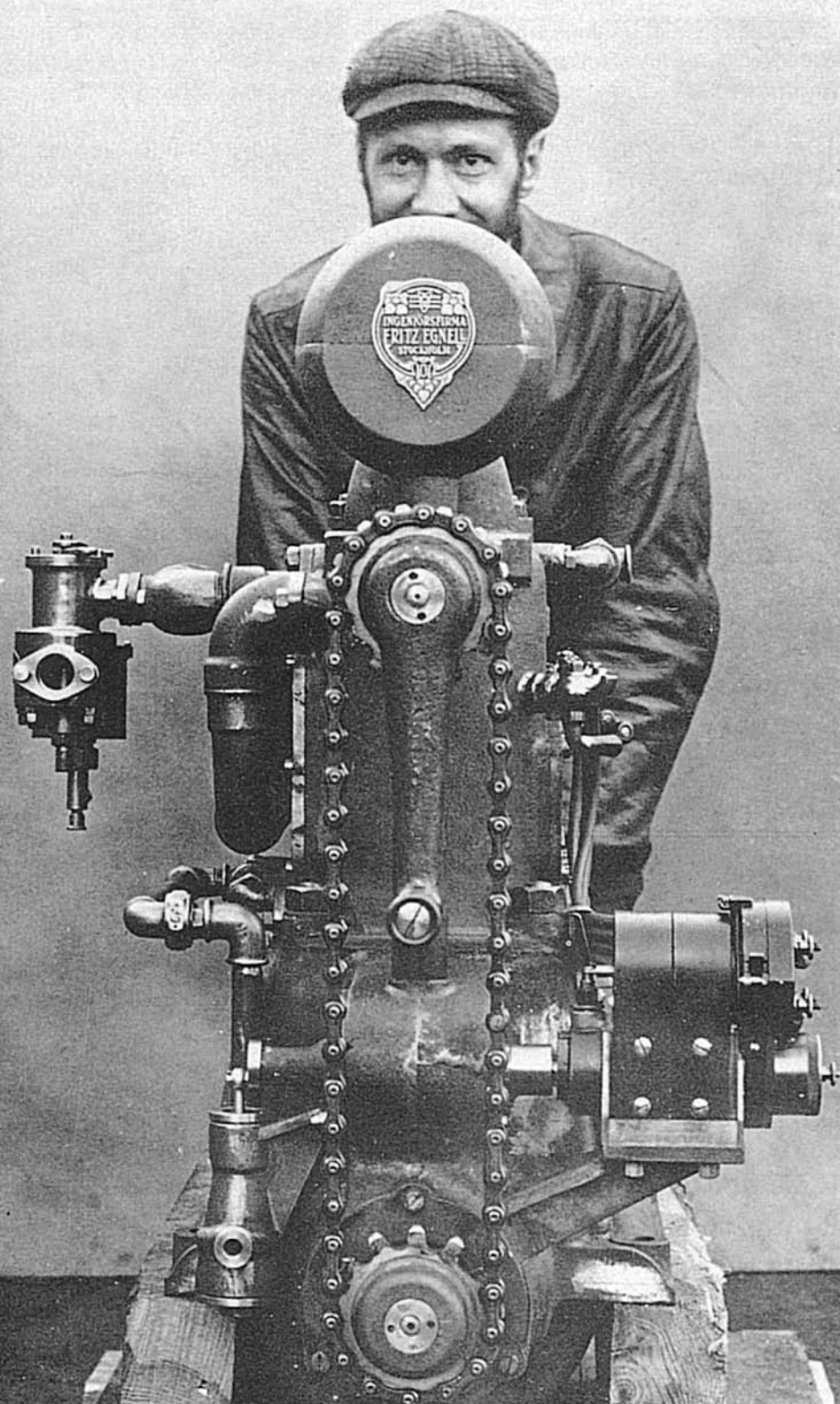
“LET’S CALL THE ENGINE PENTA” One day back in 1907 a man in his thirties stepped off the train in Skövde, Sweden and walked over the rails to a large mechanical workshop not far from the station area. The man had a thick dark beard and was wearing a long coat, a cap – and wooden shoes. His arrival did not spark a great deal of attention, though there was something eccentric about his manner.

The young man was Edvard Hubendick, one of the leading engine designers of his time. He would later become a professor of combustion engine technology at the Institute of Technology in Stockholm, but at the time of this story he was employed at the engineering company, Fritz Egnell in Stockholm.

Edvard Hubendick had come to this bustling town to see over the manufacturing of a smaller test engine at the foundry and works, Sköfvde Gjuteri & Mekaniska Verkstad. It was a good challenge for the talented engineer. Many years later, he would gladly reminisce over his days spent developing the first wholly Swedish-built boat engine.

Hubendick’s employer, engineer Fritz Egnell, was a boating enthusiast and had amused himself by installing and test driving a German engine in Stockholm’s archipelago. But the engine did not measure up to expectations. An enterprising man, Fritz Egnell decided to improve the design and it was obvious that Edvard Hubendick was perfect for the task.

Hubendick was described as an extremely exact if not pedantic person and we can surmise that he oversaw every phase in the manufacturing. No surprise that the result was something completely special. He presented a one-cylinder engine with an output of three horsepower. With an overhead camshaft and overhead valves, it was described as being “the most modern on the market”.



View of Sköfvde Gjuteri & Mekaniska Verkstad



Proud and satisfied, Hubendick returned to Stockholm. During a meeting at Fritz Egnell's office, plans were then drawn up for production of the new boat engine. But one challenge remained – during development the engine had been designated B 1. Now it was time to give it a better name, a name that would sell.

The five gentlemen sitting around the table made various proposals. We know that Fritz Egnell, Edvard Hubendick and works manager John G. Grönvall from Sköfvde Mekaniska were present. The other two people were probably close colleagues of Grönvall. History does not reveal who of the five finally said:

– Let's call the engine Penta!

Penta means five in Greek.



Production of the Penta engine started the following year and the first 20 engines were released on the market in 1909. The motor was an immediate success. By 1910, Skövde Mekaniska showed a profit of 55,000 SEK, a huge amount at that time.

Demand for the engines increased steadily and the workforce grew from 129 to 155. In 1916, Fritz Egnell bought out the old owner family Grönvall and took over the company. A few years later, he marked the importance of the Penta engine by renaming the classic foundry and works to AB Pentaverken.

The first engine was quickly followed by new models, and a total of 3,268 Penta engines were manufactured by 1920.

1920-1929

THE FIRST BREAKTHROUGH The boom carried on for years, but the Great Depression following the war soon changed everything. Shortages of paraffin and gasoline meant that sales of engines dropped dramatically. Pentaverken was forced to lay off many workers and take a

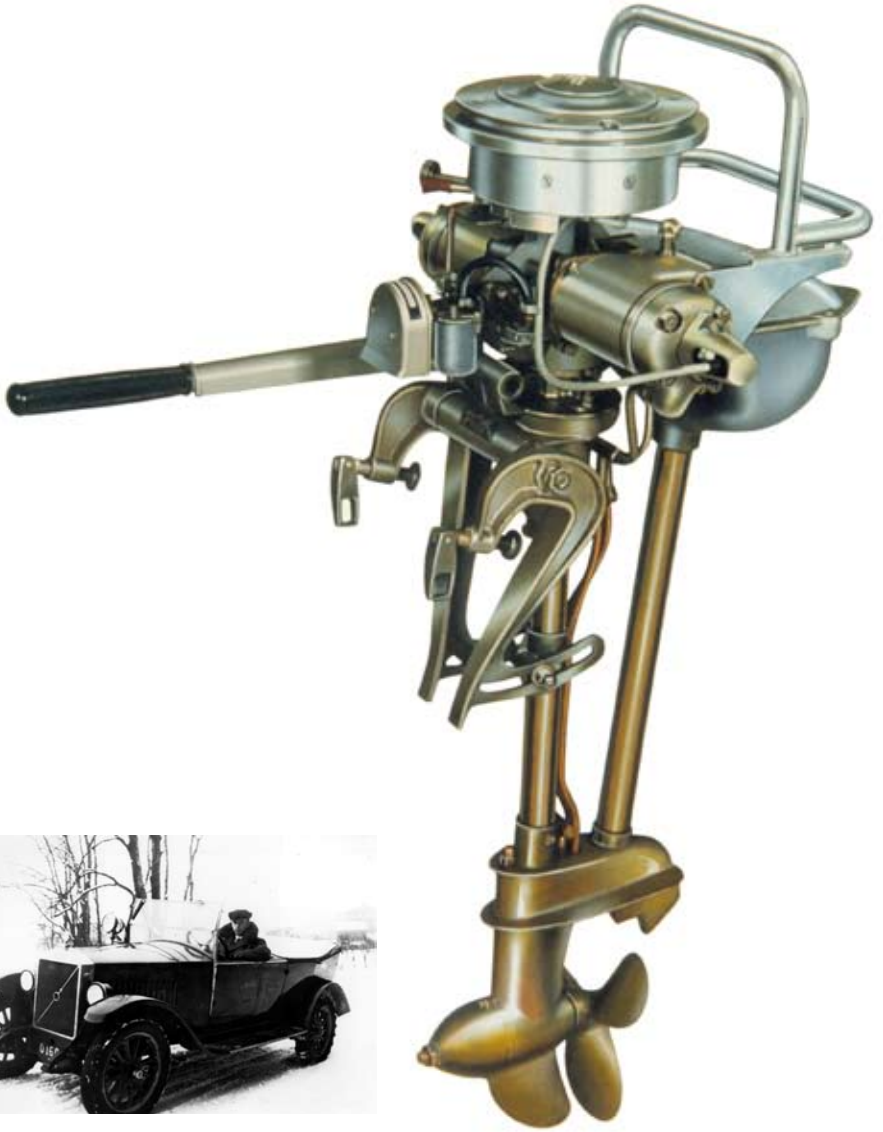
bank loan to keep the factory in operation. In the meantime, the water turbine manufacturing business helped keep the company afloat.

The engine that would save the day was an outboard developed in-house and called U2. Production began in 1922. Robust, easy to maintain, reliable and relatively inexpensive, this 2-cylinder engine quickly attracted the attention of small boat owners and sales skyrocketed. By 1930, a total of 7,874 engines had been sold.

The outboard put money in the bank and made Penta a well-recognized name in the boating world. In today's jargon, you could say that this breakthrough engine built the brand. After all, Penta was seen as standing for quality and reliability – traits that would become valuable hallmarks for the company.

Continuously improved, the U2 proved to be an enduring success – and was produced in different variations all the way up to 1962.

In 1925, Volvo's founders, Assar Gabrielsson and Gustaf Larson, decided to invest in a Swedish built engine for Volvo's new car – a decision that would have a profound impact on Pentaverken's future. They visited Pentaverken later that year to discuss prices and delivery terms for a 2-liters engine. Pentaverken's records describe the negotiations as being difficult and "painful", due to the extreme price demands by the men from Göteborg. Nevertheless, they came to an agreement and signed a contract.



Delivery of the car engines began in 1927, the same year that the first Volvo emerged from the factory on Hisingen. By 1929, Pentaverken delivered almost 3,000 engines to Volvo in Göteborg. The boat engines still dominated production, but car engines were becoming increasingly important.

1930-1939

VOLVO TAKES OVER In the early 1930s, Fritz Egnell wrestled with serious problems at Pentaverken. Production was plagued by recurring disruptions since car-, boat- and industrial engines had to share the same space in the crowded factory. Despite modern production methods with conveyor belts and time studies, personnel often had to work day and night to keep up with the orders.

The problems led Göteborgs Bank to cancel all loans and credits and become the majority shareowner in the company. This in turn opened the door for a new owner.

For Assar Gabrielsson and Gustaf Larson this was a perfect opportunity to take control over engine development and production. So, in 1935, Volvo bought all the shares and became the sole owner of the factory. Its name was changed to Volvo Pentaverken. They also decided to move the departments for design and sales from Skövde and created AB Pentaverken in Göteborg. It was from this company that AB Volvo Penta would later emerge.

In 1939, Pentaverken in Göteborg was not much larger than an ordinary car repair shop. The company had 11 people on its salary and was housed in the old Nordiska Kullagers ball bearings factory on what is today the site of Volvo Trucks. New products were developed here, yet the U2 outboard remained the primary revenue source. In fact, the U2 dominated the market throughout the 1930s, with sales topping 10,000 engines.

In Skövde, the most obvious change that came with the new owners was the employment of women in the factory. It was of course a sign of the times – the old rural industry culture was on the way out and a modern industrial society was on the way in.



The factory managed to get its production in order and the situation improved considerably during the 1930s – very much due to the increased demand for Volvo cars. About 40,000 car engines were produced at the factory by 1940. Then the war came, and everything changed.

AN OPERATION ON LOW HEAT The 1940s was a black decade in Europe's history, and the only option for Penta, like most companies, was to wait it out and hope for better times.

Looking back, these were the most challenging times in Volvo Penta's history. Sales of marine engines fell dramatically and remained at a catastrophically low level during the entire decade.

1940-1949

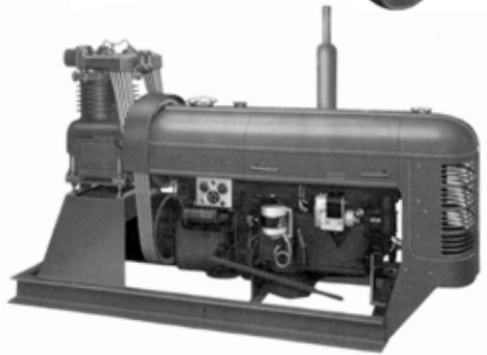
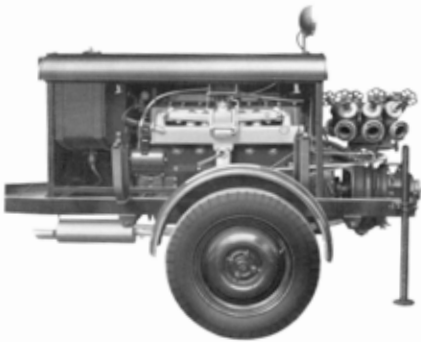
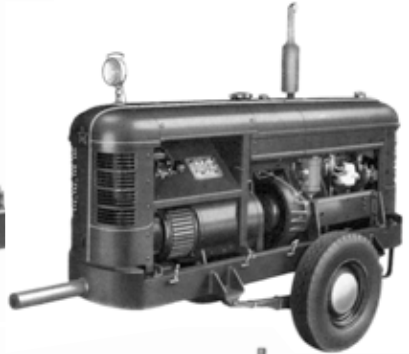
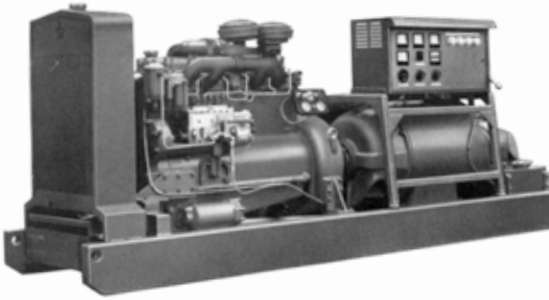
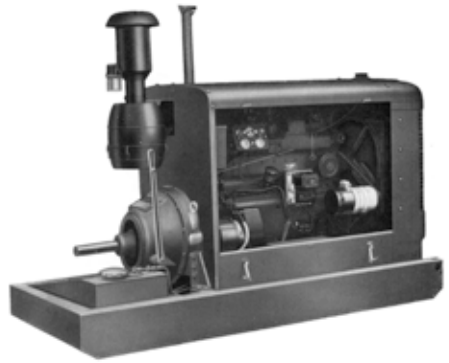
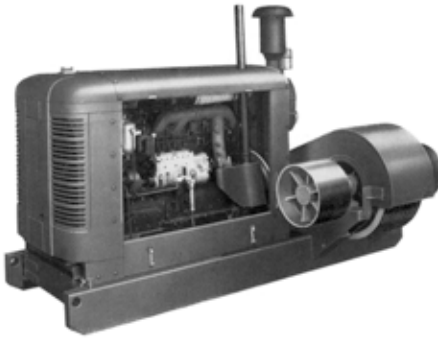
The total collapse of outboard sales was primarily due to gasoline rationing, and the future looked bleak for the previously so profitable product. By 1943, Volvo's leaders had no other choice but to sell the manufacturing. The buyer was one of Sweden's largest companies, namely Electrolux.

During the war and the years immediately following, sales of cars, trucks and buses kept Volvo afloat. Manufacturing at Pentaverken, on the other hand, went on low heat. The company's customers were found in the Swedish air force, marines, army, civil defense and in industry. Even though the customer list appeared long and impressive, the orders usually involved small volumes.

Two decisions however would have a profound impact on the future. In 1946, the rather ungainly Pentaverken name was changed to AB Penta. And, in 1949, Harald Wiklund was made executive manager. With a strong flair for business and full of bold ideas, he would lead AB Penta for the next 28 years.

Marketing during the 1940s was marked by the war. But when peace finally came, sprouted optimism and a confidence in the future.





Penta's engines were used in pumps, power generators, air-raid shelters, landing boats and in construction equipment. A smaller number went to fishing boats and other commercial customers. By the end of the 1940s total sales fell to less than 100 engines annually.

THE SECOND BREAKTHROUGH On June 1, 1949, Harald Wiklund took the helm of AB Penta. Under his leadership the company began a voyage that in classical terms could be described as per aspera, ad astra – through the difficulties, toward the stars.

1950-1959

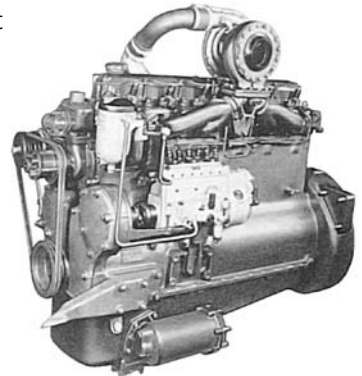
By 1950, Harald Wiklund had managed to increase turnover five-fold, from two to ten million SEK. In 1955, AB Penta could move into new, modern premises at Backaplan in Göteborg.

Harald Wiklund's strategy was to develop a complete engine range. He began work to modify diesel engines from Volvo Trucks for marine and industrial use. He systematically built up a distributor network in Sweden and abroad, and nurtured relationships with boat builders and industrial customers. He also focused on the spare parts business.

According to Harald Wiklund: "You don't sell an engine, good engines sell themselves when the customer wants to buy one. But when the customer comes by you have to be able to also provide good service."

Several new boat engines became top sellers, such as the MD-1, the world's first true sailboat engine. The single-cylinder engine, the smallest on the market, was equipped with direct injection diesel and a revolutionary reduction reverse gear. MD-1 was followed by MD-2, also a huge success. Both engines were manufactured at the factory in Flen.

Another exciting innovation was the world's first turbo-charged diesel, TMD-96, which received a great deal of international attention when launched in 1956.



TD96

The new engines reinforced the image of Penta as being at the technological forefront. Yet the ultimate proof came with the famous Aquamatic sterndrive. Designed by American Jim Wynne, it ingeniously combined the strength of the inboard engine with the simplicity and steerability of the outboard.

The Aquamatic sterndrive was officially launched at the New York Boat Show in 1959, and became an instant sensation. Not least of all because the newly crowned, world heavyweight champion boxer, Ingemar Johansson participated in the launch activities.

In just ten years, Penta had evolved from a company in deep crisis to one of the boating world's most innovative and exciting companies.



During the 1950s, the service organization was built up, forming the foundation for today's Volvo Penta. Within just 10 years, Harald Wiklund and a handful of colleagues had transformed Penta into one of the world's leading marine companies with a turnover of 50 million SEK.

BUSINESS GROWS With the Aquamatic sterndrive, Penta entered the rebellious 1960s as a leader. Harald Wiklund changed the company name to AB Volvo Penta, taking advantage of Volvo's respected global reputation. New subsidiaries were started in England, Germany and Italy and huge strides were made in South America.

1960-1969

Initially, sales of the Aquamatic sterndrive were modest. Boat builders were simply not ready to embrace the revolutionary concept over night. But it soon caught on, and a new factory in Köping was built to keep up with demand. In 1962, 2,000 sterndrive packages were sold. In 1969, total sales reached 15,000 sterndrive packages and some 5,000 sterndrives. Jim Wynne's unusual design had become Volvo Penta's most important product and the factory in Köping had to introduce two work shifts to keep up with orders.

In Göteborg, the workforce had grown to 500 people, making the Backa-plan premises cramped and inadequate. So in 1969 the company moved to its present facilities at Gropegårdsgatan.

During the 1960s, the wheels of industry were spinning at full speed. Volvo Penta's industrial engines were highly sought after in Sweden and Europe and new product launches were frequent.

The engines were used in power generators and compressors exported around the world. While Volvo Penta's 6-cylinder diesel, the GP engine, became a popular solution in many fishing and commercial boats.



AQ80 with drive



During the 1960s, Volvo Penta's industrial engines were highly sought after for irrigation and diesel-powered generator units. Not least of all, the classic 100-engine that was exported in huge numbers to the Middle East for use in irrigation systems.

A CONVERSATION BY THE FENCE The boom years continued into the 1970s. Turnover reached more than a half billion SEK. Volvo Penta was the Swedish market leader and the largest supplier of marine engines in western Europe.

1970-1979

1973 was a memorable year for many reasons. Volvo Penta expanded its product range and bought the manufacturing of Monark and Archimedes outboards. The same year, the company presented the classic saildrive for sailing boats, an engine package that virtually eliminated vibrations and noise.

The saildrive became an enormous success and strengthened the image of Volvo Penta as the innovative leader in marine drive systems.

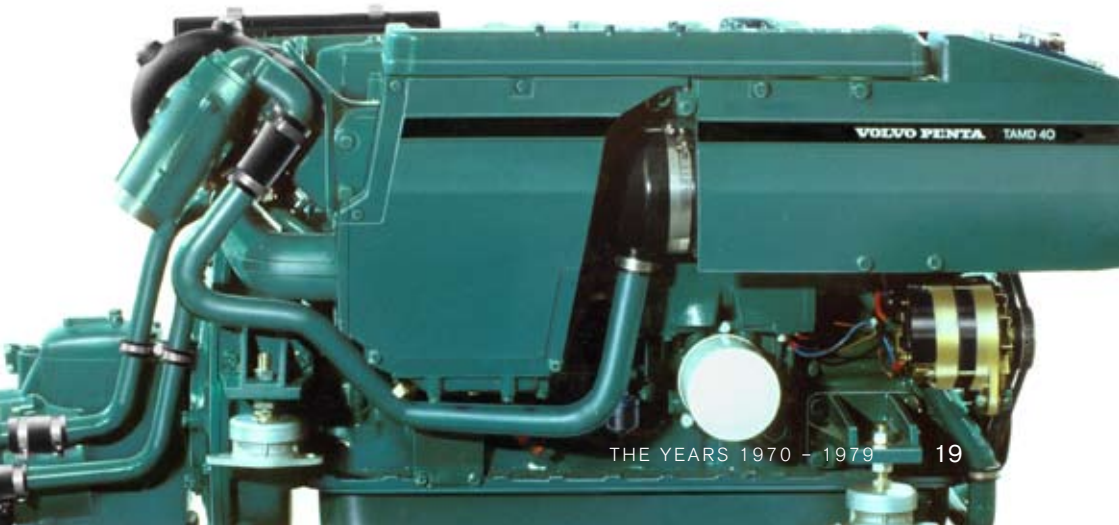
Nonetheless, the outboards never became much of a success, mostly due to extreme competition from Japan. In 1979, Volvo Penta closed its outboard manufacturing operation – leaving the outboard market for good.

Previously, the Aquamatic sterndrive could only be combined with gasoline engines. But with “the Fence Engine”, Volvo Penta was able to develop a high performance diesel with high rpms that worked perfectly together with the sterndrive. It created a completely new market in the boating world, a market in which Volvo Penta has been the unchallenged leader ever since.





A classic story from the 1970s is the so-called "Fence Engine". Harald Wiklund and Volvo Trucks executive manager Lars Malmros were neighbors. And like good neighbors they often discussed common interests and problems over the fence that divided their properties. It was here that they came up with the idea to design a new lightweight engine that would be suitable for both boats and trucks.



“The Fence Engine” and its successors built on the same basic design were manufactured all the way up to 2005, totaling 212,992 engines. It is by far the most important engine in Volvo Penta’s history.

By the time Harald Wiklund retired in 1977, he had transformed Volvo Penta from a small production workshop to a world-leading marine company. Sales increased during his 28 years of leadership from 2 million SEK to 800 million SEK annually.

Volvo Penta was now a recognized name in the boating world, a company admired for its technical knowledge and innovative power.

By the end of the decade, Volvo Penta became a pawn in a large-scale game. The so-called Norway Agreement gave the country of Norway ownership in the economically troubled Volvo. In exchange, Volvo would get access to North Sea oil reserves. A clause in the agreement also stated that Volvo Penta’s headquarters would be moved to Norway.

But after strong protests, the agreement fell through – and Volvo Penta was able to stay in Göteborg.



Harald Wiklund



The Nordic element in the marketing of outboards was hard to miss. Even today, many people connect Volvo Penta with outboards – despite the fact that sales of the company's outboards came to an end back in 1979.



Jim Wynne strikes a champagne bottle on one of the first Aquamatic stern drives ever built to celebrate the birth of the concept 20 years earlier. The anniversary party took place at



the New York Boat Show in 1979. The very first drive that Jim Wynne constructed was built out of odd bits of metal scrap in his mother's backyard in Miami, Florida.


DUOPROP IS LAUNCHED Volvo Penta entered the 1980s full of optimism and ready to expand. Sales passed one billion SEK and the company became an independent entity within the Volvo Group in 1982.

The same year, Duoprop was launched and became a market sensation.

1980-1990

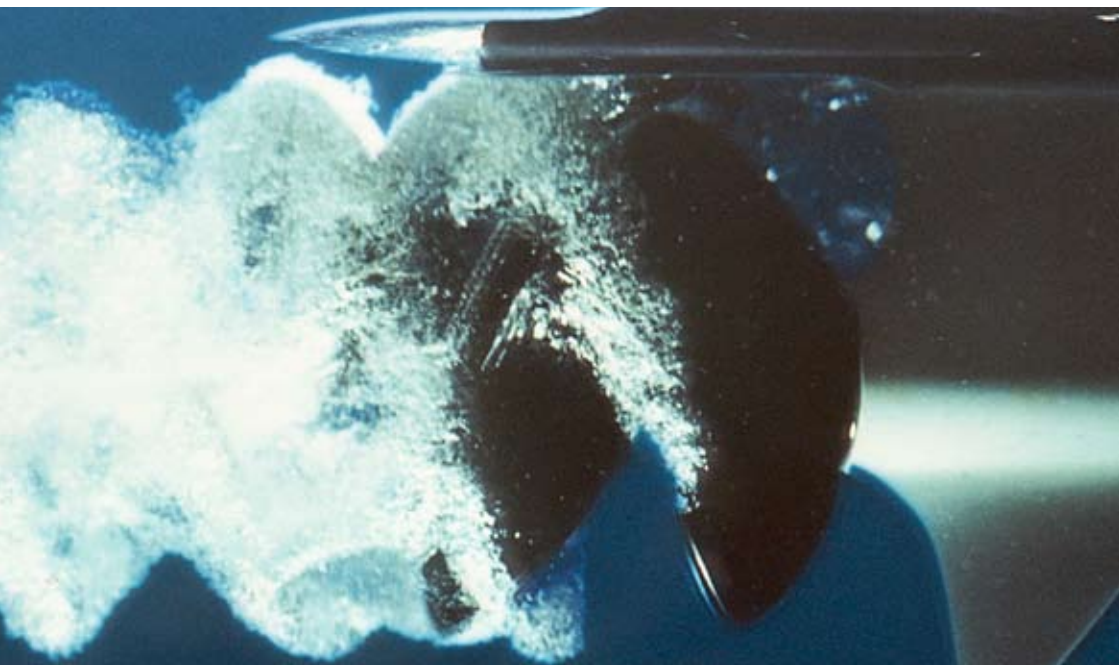
Simply put, the Aquamatic sterndrive was given an extra propeller. The two counter-rotating propellers on the same shaft gave unparalleled performance and maneuverability.

Volvo Penta presented the 30-engine, a 4-cylinder diesel developed from “the Fence Engine”, and a series of smaller boat engines, the 2000 series, offering 18 to 45 hp. Also introduced were the workhorses TMD 120 with 326 hp and TAMD 121 with up to an amazing 400 hp.



Duoprop helped to stimulate boating life following the 1970s oil crisis and business gradually improved. New, smarter, more fuel-efficient engines were launched and contributed to the new successes. Product innovations were introduced one after another.

The 1980s represented a breakthrough in industrial engines and power generators. Volvo Penta's large 16-liters diesel engines, TID 162, were delivered factory-assembled with generators in a so-called Genset. The diesel-powered generator units were used in many applications, particularly as a power source for driving pumps and irrigation systems in developing countries and as reserve power in factories and hospitals. Volvo Penta also invested heavily in new production facilities in Göteborg, including advanced test rooms. The headquarters was expanded, so too were the testing facilities at Krossholmen in Göteborg's archipelago. In 1989, the Berlin wall fell, and a new era began that would have great importance for Volvo Penta – the emergence of information technology.



ELECTRONICS MAKES ITS ENTRANCE During the 1990s, product development and new engine launches moved forward at an astonishing pace. The industrial engines and commercial boat engines grew in importance – helping to offset the huge swings in the leisure boat market.

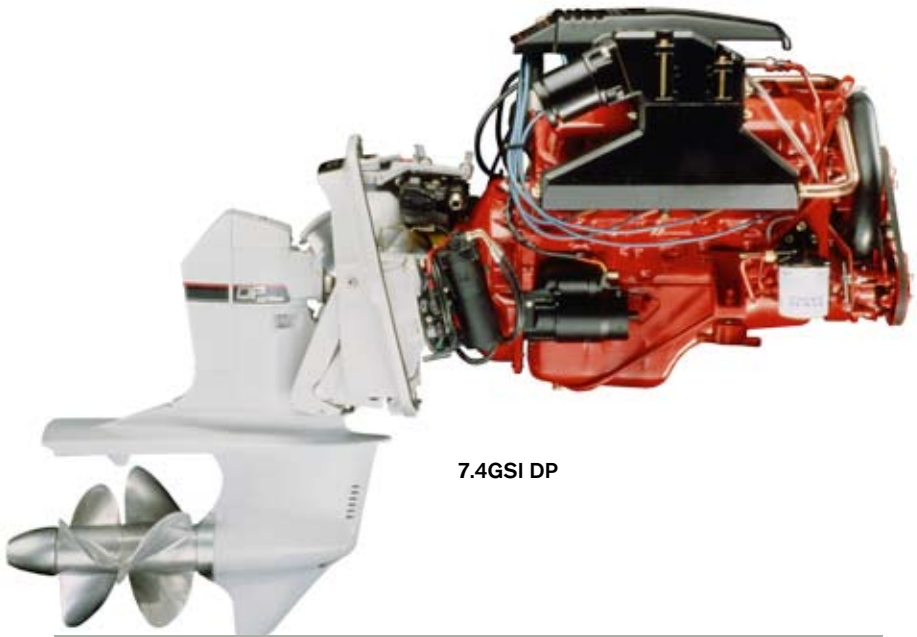
1991-2000

In 1991, Volvo Penta launched the KAD-concept, a new generation engine with lower weight that gave reduced emissions and reduced fuel consumption. The next year, in Lexington, Tennessee, Volvo Penta began manufacturing gasoline engines and Aquamatic sterndrives for the increasingly important American market.

In 1995, the new information technology made its entrance in the boating industry when Volvo Penta introduced Electronic Diesel Control, a system for electronic control and monitoring of the engine. Needless to say, the boating press was ecstatic. In one bold sweep, the new technology had replaced the century old tradition of mechanical control.

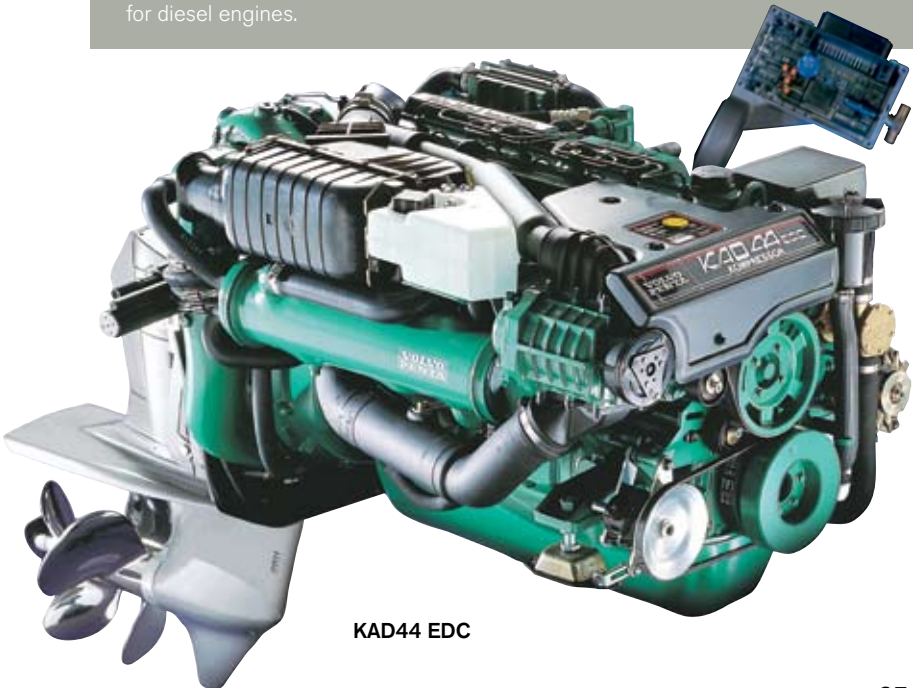
EDC marked the start of a technological revolution at sea. Volvo Penta was able to take advantage of the joint development of electronic systems in engines and vehicles within the Volvo Group – and apply the new technology to the marine environment. The results of these efforts would arrive after the new millennium.

In Asia, China's economy was growing at an astounding speed. To take part in the business opportunities there, Volvo Penta formed an Asian-based subsidiary and, in a joint venture with a Chinese company, established an assembly factory for industrial engines in Wuxi, outside Shanghai.



7.4GSI DP

When it comes to introducing electronics in the boat industry, Volvo Penta continues to lead the way. The first steps were taken in the mid-1990s with EFI, Electronic Fuel Injection for gasoline engines and EDC, Electronic Diesel Control for diesel engines.



KAD44 EDC

THE THIRD BREAKTHROUGH Volvo Penta began the new millennium with the most comprehensive product renewal efforts in the boating industry. Virtually the entire engine range has been replaced. Electronics has taken the big leap into the marine world. And a completely

2001-2007

new propulsion system has been introduced, resulting in engines that are cleaner, simpler, quicker and quieter.

In 2003, the launch of the D4/D6, a worthy successor of “the Fence Engine”, was the big news in the marine business. Specially developed for boats, the D4/D6 features top modern technology and superior performance, and is manufactured at the factory in Vara. It has quickly become the new favorite for boaters.

The grand march of electronics into the marine industry continued with Volvo Penta's new electronics platform, EVC (Electronic Vessel Control). With EVC as a base, Volvo Penta was ready in 2005 to write the next chapter in boating history – the launch of Volvo Penta IPS, Inboard Performance System.

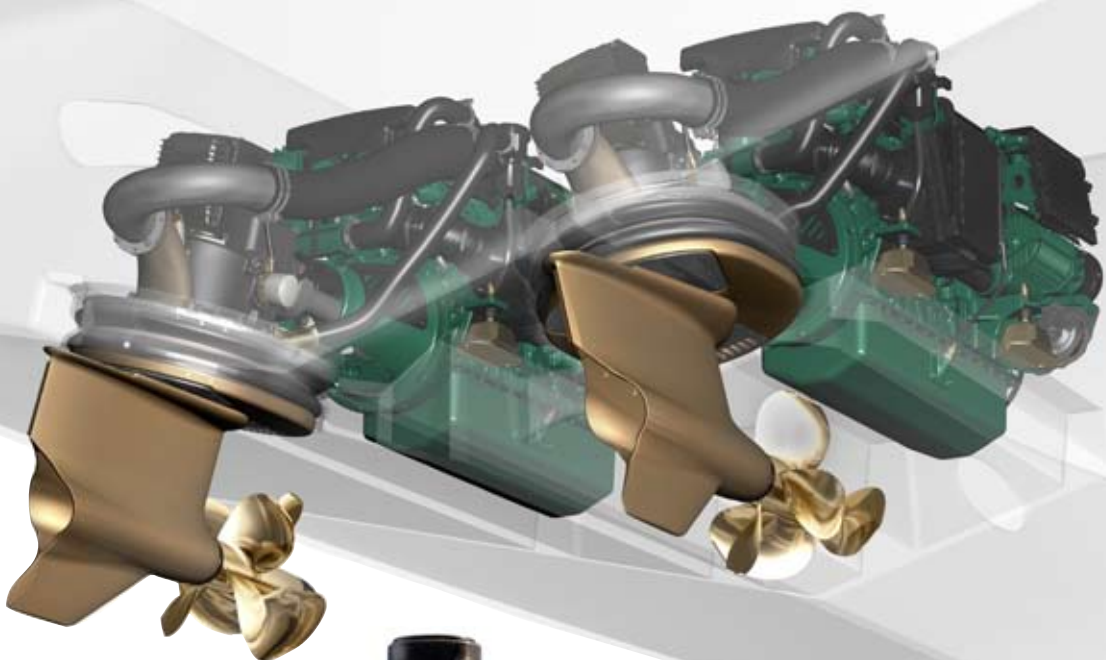
With Volvo Penta IPS, the company took a huge technological leap, starting a new epoch.

Perhaps the most distinctive feature of IPS is its propellers. They face forwards instead of backwards, giving improved pull power. What's more, with steerable drive units there is no longer a need for a rudder onboard.

By taking advantage of electronics, Volvo Penta was first to develop the next sensation in the marine world: the joystick – a skipper's dream.

The innovative joystick makes it easier to dock a boat than park a car. Now, the anxiety that often comes with docking is just a memory.

The joystick and the IPS system have become the great challengers to inboard shafts – just as they were intended.



Volvo Penta has continued on its groundbreaking path, further developing drive systems and electronics applications. In the autumn of 2006, the first four-engine installation of IPS on a single 75-foot boat was performed. This opened a new market for IPS as a drive system for really large pleasure boats.

The industrial engines, primarily manufactured in Skövde, have become an increasingly important business and now account for a quarter of Volvo Penta's total sales. The development and sales of industrial motors gives synergy effects to the Volvo Group's other engine programs, and in this way Volvo Penta is able to actively contribute to the Group's continued development and competence.

Volvo Penta surpassed six billion SEK in sales at the millennium. Today, turnover is a good bit over 10 billion SEK – a perfect way to mark our 100 years anniversary.

Few could have imagined this remarkable success story when Edvard Hubendick stepped off the train in Skövde and began designing the first outboard.

In 2007, Volvo Penta is the undisputed market leader.



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