# The Volkswagen Beetle



The Volkswagen Beetle, officially called the Volkswagen Type 1 (or informally the Volkswagen Bug), is an economy car produced by the German auto maker Volkswagen (VW) from 1938 until 2003. With over 21 million manufactured in an air-cooled, rear-engine, rear-wheel drive configuration, the Beetle is the longest-running and most-manufactured car of a single design platform, worldwide.

Although designed in the 1930s, the Beetle was only produced in significant numbers from 1945 on, when the model was internally designated the Volkswagen Type 1, and marketed simply as the "Volkswagen". Later models were designated VW 1200, 1300, 1500, 1302 or 1303, the former three indicating engine displacement and the latter two being derived from the type number and not indicative of engine capacity. The model became widely known in its home country as the Käfer (German for "beetle") and was later marketed as the Volkswagen Beetle in other countries.

In the 1950s, the Beetle was more comfortable and powerful than most European small cars, having been designed for sustained high speed on the Autobahns. It remained a top seller in the U.S., owing much of its success to high build-quality and innovative advertising, ultimately giving rise to variants, including the Volkswagen Karmann Ghia and the Volkswagen Type 2 bus.

The Beetle had marked a significant trend led by Volkswagen, Fiat, and Renault whereby the rear-engine, rear-wheel drive layout had increased from 2.6% of continental Western Europe's car production in 1946 to 26.6% in 1956. The 1948 Citroën 2CV and other European models marked a later trend to front-wheel drive in the European small car market, a trend that would come to dominate that market. In 1974, Volkswagen's own front-wheel drive Golf model succeeded the Beetle. In 1994, Volkswagen unveiled the Concept One, a "retro"-themed concept car with a resemblance to the original Beetle, and in 1998 introduced the "New Beetle", built on the Golf platform with styling recalling the original Type 1.

## Design overview

The Beetle featured a rear-located, rear-wheel drive, air-cooled four-cylinder, boxer engine in a two-door bodywork featuring a flat front windscreen, accommodating four passengers and providing luggage storage under the front bonnet and behind the rear seat – and offering a coefficient of drag of 0.41. The bodywork attached with eighteen bolts to its nearly flat chassis which featured a central structural tunnel. Front and rear suspension featured torsion bars along with front stabilizer bar – providing independent suspensions at all wheels. Certain initial features were subsequently revised, including mechanical drum brakes, split-window rear windows, mechanical direction-indicators and the non-synchronized gearbox. Other features, including its distinctive overall shape, endured.

Its engine, transmission, and cylinder heads were constructed of light alloy. An engine oil cooler (located in the engine fan's shroud) ensured optimal engine operating temperature and long engine life, optimized by a thermostat that bypassed the oil cooler when the engine was cold. Later models of the carburettor featured an automatic choke. Engine intake air passed through a metallic filter, while heavier particles were captured by an oil bath. After 1960, steering featured a hydraulic damper that absorbed steering irregularities.

Indicative of the car's utilitarian design, the interior featured painted metal surfaces, a metal dash consolidating instruments in a single, circular binnacle, adjustable front seats, a fold-down rear seat, optional swing-out rear windows, front windows with pivoting vent windows, heating via air-to-air exchange manifolds operating off the engine's heat, and a windshield washer system that eschewed the complexity and cost of an additional electric pump and instead received its pressurization from the car's spare tire (located in the front luggage compartment) which was accordingly overinflated to accommodate the washer function.

Throughout its production, VW marketed the Beetle with a four-speed, manual transmission. From 1961 (and almost exclusively in Europe), VW offered an optional version of the Saxomat semi-automatic transmission — a regular 4-speed manual transaxle coupled to an electromagnetic clutch with a centrifugal clutch used for idle. Subsequently (beginning in 1967 in Europe and 1968 in the United States), VW offered an optional semi-automatic transmission — marketed as Automatic Stick Shift and also called AutoStick) — which was a 3-speed manual coupled to an electromatic clutch and torque converter.

While the overall appearance of the Beetle changed little over its life span, it received over 78,000 incremental changes during its production

## History

### "The People's Car"



In 1931, Ferdinand Porsche developed the Porsche Type 12, or "Auto für Jedermann" (car for everybody) for Zündapp. Porsche already preferred the flat-four engine, and selected a swing axle rear suspension (invented by Edmund Rumpler), while Zündapp insisted on a water-cooled five-cylinder radial engine. In 1932, three prototypes were running. All of those cars were lost during World War II, the last in a bombing raid in Stuttgart in 1945.

The Zündapp prototypes were followed by the Porsche Type 32, designed in 1933 for NSU Motorenwerke AG, another motorcycle company. The Type 32 was similar in design to the Type 12, but had a flat-four engine. NSU's exit from car manufacturing resulted in the Type 32 being abandoned at the prototype stage.

In 1933, Adolf Hitler gave the order to Ferdinand Porsche to develop a Volkswagen (literally, "people's car" in German. The epithet Volks, literally "people's", had been previously applied to other Nazi sponsored consumer goods such as the Volksempfänger ("people's radio"). Hitler required a basic vehicle capable of transporting two adults and three children at 100 km/h (62 mph). The "People's Car" would be available to citizens of the Third Reich through a savings scheme, or Sparkarte (savings booklet), at 990 Reich mark, about the price of a small motorcycle (an average income being around 32RM a week).

### Development

Initially designated the Porsche Type 60 by Ferdinand Porsche, the design team included Erwin Komenda and Karl Rabe. In October 1935 the first two Type 60 prototypes, known as the V1 and V2 (V for Versuchswagen, or "test car"), were ready. In 1936, testing of three further V3 prototypes, built in Porsche's Stuttgart shop, began. A batch of thirty W30 development models, produced for Porsche by Daimler-Benz, underwent 1,800,000 mi (2,900,000 km) of further testing in 1937. All cars already had the distinctive round shape and the air-cooled, rear-mounted engine. A further batch of 44 VW38 pre-production cars produced in 1938 introduced split rear windows; both the split window and the dash were retained on production Type 1s until 1953. The VW38 cars were followed by another batch of 50 VW39 cars, completed in July 1939.

The car was designed to be as simple as possible mechanically, so that there was less to go wrong; the air-cooled 25 BHP (19 kW) 995 cc (60.7 cu in) motors proved especially effective in actions of the German Afrika Korps in Africa's desert heat. This was due to the built-in oil cooler and the superior performance of the flat-four engine configuration. The suspension design used compact torsion bars instead of coil or leaf springs. The Beetle is also nearly airtight and can float for several minutes on water.

Originally dubbed the “Strength through Joy Car” (Kraft durch Freude-Wagen) after World War II, it was known as the Volkswagen Type 1, but became more commonly known as the Beetle.

### Standard Superior



Historian Paul Schilperoord argued in his 2011 biography of Josef Ganz that Hitler stole the idea for the Volkswagen Beetle from Ganz's "May Bug," which he saw in 1933 at an auto show. There is a strong resemblance to the Standard Superior, an automobile produced from 1933-1935 by Standard Fahrzeugfabrik of Ludwigsburg, Germany, founded by motorcycle maker Wilhelm Gutbrod and unrelated to the Standard Motor Company of England. These small cars were designed according to the patents by Josef Ganz and featured transverse, two-stroke, two-cylinder engines mounted in front of the rear axle.

### Influence of Tatra

The Austrian car designer Hans Ledwinka was a contemporary of Porsche working at the Czechoslovakian company Tatra. In 1931, Tatra built the V570 prototype, which had an air-cooled flat-twin engine mounted at the rear. This was followed in 1933 by a second V570 prototype with a streamlined body similar to that of the Porsche Type 32. The rear-engine, rear-wheel drive layout was a challenge for effective air cooling and during development of the much larger V8 engine Tatra T77 in 1933 Tatra registered numerous patents related to air flow into the rear engine compartment.

Both Hitler and Porsche were influenced by the Tatras. Hitler was a keen automotive enthusiast, and had ridden in Tatras during political tours of Czechoslovakia. He had also dined numerous times with Ledwinka. After one of these dinners Hitler remarked to Porsche, "This is the car for my roads". From 1933 onwards, Ledwinka and Porsche met regularly to discuss their designs, and Porsche admitted "Well, sometimes I looked over his shoulder and sometimes he looked over mine" while designing the Volkswagen. The Tatra T97 of 1936 had a 1,749 cc, rear-located, rear-wheel drive, air-cooled four-cylinder boxer engine. It cost 5,600 RM and accommodated five passengers in its extensively streamlined four-door body, which provided luggage storage under the front bonnet and behind the rear seats. It also featured a similar central structural tunnel found in the Beetle.

Just before the start of the Second World War, Tatra had ten legal claims filed against VW for infringement of patents. Although Ferdinand Porsche was about to pay a settlement to Tatra, he was stopped by Hitler who said he would "solve his problem". Tatra launched a lawsuit, but this was stopped when Germany invaded Czechoslovakia in 1938, resulting in the Tatra factory coming under Nazi administration in October 1938. The T97, along with the T57, were ordered by Hitler to be removed from the Tatra display at the 1939 Berlin Autosalon and Tatra was later directed to concentrate on heavy trucks and diesel engines, with all car models, except for the V8-engined Tatra T87, being discontinued. The matter was re-opened after World War II and in 1961 Volkswagen paid Ringhoffer-Tatra 3,000,000 Deutsche Marks in an out of court settlement.

### Wartime production



The factory had only produced a handful of cars by the start of the war in 1939; the first volume-produced versions of the car's chassis were military vehicles, the Type 82 Kübelwagen (approximately 52,000 built) and the amphibious Type 166 Schwimmwagen (about 14,000 built).

A handful of Beetles were produced specifically for civilians, primarily for the Nazi elite, in the years 1940 to 1945, but production figures were small. Because of gasoline shortages, some wartime "Holzbrenner" Beetles were fuelled by wood pyrolysis gas producers under the hood. In addition to the Kübelwagen, Schwimmwagen, and a handful of others, the factory managed another wartime vehicle: the Kommandeurwagen; a Beetle body mounted on the Kübelwagen chassis. 669 Kommandeurwagens were produced up to 1945, when all production was halted because of heavy damage to the factory by Allied air raids. Much of the essential equipment had already been moved to underground bunkers for protection, which let production resume quickly after hostilities ended.

### Post-war production and boom

In occupied Germany, the Allies followed the Morgenthau plan to remove all German war potential. As part of this, in the Industrial plans for Germany, the rules for which industries Germany was to be allowed to retain were set out. German car production was set at a maximum of 10% of the 1936 car production numbers.

Mass production of civilian VW cars did not start until post-war occupation. The Volkswagen factory was handed over by the Americans to British control in 1945; it was to be dismantled and shipped to Britain. Thankfully for Volkswagen, no British car manufacturer was interested in the factory; "the vehicle does not meet the fundamental technical requirement of a motor-car ... it is quite unattractive to the average buyer ... To build the car commercially would be a completely uneconomic enterprise." The factory survived by producing cars for the British Army instead. Allied dismantling policy changed in late 1946 to early 1947, although heavy industry continued to be dismantled until 1951. In March 1947, Herbert Hoover helped change policy by stating "There is the illusion that the New Germany left after the annexations can be reduced to a 'pastoral state'. It cannot be done unless we exterminate or move 25,000,000 people out of it." The re-opening of the factory is largely accredited to British Army officer Major Ivan Hirst (1916–2000). Hirst was ordered to take control of the heavily bombed factory, which the Americans had captured. His first task was to remove an unexploded bomb that had fallen through the roof and lodged itself between some pieces of irreplaceable production equipment; if the bomb had exploded, the Beetle's fate would have been sealed. Hirst persuaded the British military to order 20,000 of the cars, and by March 1946 the factory was producing 1,000 cars a month, which Hirst said "was the limit set by the availability of materials". During this period, the car reverted to its original name of Volkswagen and the town was renamed Wolfsburg. The first 1,785 Type 1s were made in 1945.

Following the British Army-led restart of production, former Opel manager (and formerly a detractor of the Volkswagen) Heinz Nordhoff was appointed director of the Volkswagen factory. Under Nordhoff, production increased dramatically over the following decade, with the one-millionth car coming off the assembly line by 1955. During this post-war period, the Beetle had superior performance in its category with a top speed of 115 km/h (71 mph) and 0–100 km/h (0–60 mph) in 27.5 seconds with fuel consumption of 6.7 l/100 km (36 mpg) for the standard 25 kW (34 BHP) engine. This was far superior to the Citroën 2CV which was aimed at a low speed/poor road rural peasant market and Morris Minor that was designed for a market that had no motorways / freeways, and even competitive with more advanced and small wheeled city cars like the Austin Mini.

In Small Wonder, Walter Henry Nelson wrote: "The engine fires up immediately without a choke. It has tolerable road-handling and is economical to maintain. Although a small car, the engine has great elasticity and gave the feeling of better output than its small nominal size."

Opinion in the United States was not flattering, however, perhaps because of the characteristic differences between the American and European car markets. Henry Ford once described the car as "a little box." The Ford Motor Company was offered the entire VW works after the war for free. Ford's right-hand man Ernest Breech was asked what he thought, and told Henry, "What we're being offered here, Mr Ford, isn't worth a damn!"

During the 1950s, the car was modified progressively: the obvious visual changes mostly concerned the rear windows. In March 1953, the small oval two-piece rear window was replaced by a slightly larger single-piece window. More dramatically, in August 1957 a much larger full width rear window replaced the oval one. 1964 saw the introduction of a widened cover for the light over the rear licence plate. Towards the end of 1964, the height of the side windows and windscreen grew slightly, giving the cabin a less pinched look: this coincided with the introduction of a very slightly curved ("panoramic") windscreen, though the curve was barely noticeable. The same body appeared during 1966, with a 1,300 cc engine in place of the 1,200 cc engine: it was only in the 1973 model Super Beetle that the Beetle acquired an obviously curved windscreen. The flat windscreen remained on the standard Beetle.

There were also changes under the bonnet. In 1954, Volkswagen added 2 mm to the cylinder bore, increasing the displacement from 1,131 cc to 1,192 cc. This coincided with upgrades to various key components including a redesign of the crankshaft. This increased power from 33 BHP to a claimed 40 BHP and improved the engine's free revving abilities without compromising torque at lower engine speeds. At the same time, compression ratios were progressively raised as, little by little, the octane rating of available fuels was raised in major markets during the 1950s and 1960s.

There were other, less-numerous models, as well. The Hebmüller cabriolet (officially Type 14A), a sporty two-seater, was built between 1949 and 1953; but numbered only 696. The Type 18A, a fixed-top cabriolet, was produced by Austro-Tatra as a police and fire unit; just 203 were assembled between January 1950 and March 1953.

Beetle sales boomed in the 1960s, thanks to clever advertising campaigns, and the Beetle's reputation for reliability and sturdiness. On 17 February 1972, when Beetle No. 15,007,034 was produced, Beetle production surpassed that of the previous record holder, the Ford Model T. By 1973, total production was over 16 million, and by 23 June 1992, over 21 million had been produced.

### Diesel

In 1951, Volkswagen produced a prototype 1.3 L diesel engine. Volkswagen made only two of these air-cooled boxer diesel engines (not turbocharged), and installed one engine in a Type 1 and another in a Type 2. The diesel Beetle was time tested on the Nürburgring and achieved 0–100 km/h (0–62 mph) in 60 seconds.

### Introduction to Ireland

Volkswagen began its involvement in Ireland when in 1949, Motor Distributors Limited, founded by Stephen O'Flaherty secured the franchise for the country at that year’s Paris Motor Show. In 1950, Volkswagen Beetles started arriving into Dublin packed in crates in what was termed "completely knocked down" (CKD) form ready to be assembled. The vehicles were assembled in a former tram depot at 162 Shelbourne Road in Ballsbridge. This is now the premises for Ballsbridge Motors who are still a Volkswagen dealer. The first Volkswagen ever assembled outside Germany was built here. This vehicle is now on display at the Volkswagen Museum in Wolfsburg.

### Introduction to the UK

The first Volkswagen Beetle dealer in the UK was J.Gilder & Co. Ltd. in Sheffield, which began selling Volkswagens in 1953. Jack Gilder had been fascinated by both the design and engineering of the Beetle when he came across one in Belgium during the war. He applied for the franchise as soon as the opportunity presented itself and became Volkswagen's representative in the North of England.

### VW Beetle 1953–1957



During this period, the rear window of the VW Beetle evolved from a divided or "split" oval, to a singular oval. Steel used for the bodywork was at its best quality, and the Wolfsburg emblem at the tip of the front of the bonnet was a complex fabrication (subsequent models deleted the emblem). The rear 'W' deck lid was hand-fabricated. The front wing had a particular 'flare out'.

### VW Beetle 1967

The Beetle changes for the 1967 model included a larger-displacement engine for the second year in a row. Horsepower had been increased to 37 kW (50 BHP) the previous year, and for 1967 it was increased to 40 kW (54 BHP).

On US, UK, and Ireland models, the generator output was increased from 180 to 360 watts, and upgraded from a 6-volt to a 12-volt system. The clutch disc also increased in size, and changes were made to the flywheel, braking system, and rear axle. New standard equipment included two-speed windscreen wipers, reversing lights, a driver's armrest on the door, locking buttons on the doors, and a passenger's side exterior mirror.

That same year, in accord with the newly enacted US Federal Motor Vehicle Safety Standard 108, the clear glass headlamp covers were deleted; the headlamps were brought forward to the leading edge of the front fenders, and the sealed-beam units were exposed and surrounded by chrome bezels. For the 1968 model year, Beetles sold outside North America received the same more upright and forward headlamp placement, but with replaceable-bulb headlamps compliant with ECE regulations rather than the US sealed beams.

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| 1967 Volkswagen Beetle |
| Engine | 1,500 cc OHV H440 kilowatts (54 BHP) @ 4,200 rpm105 N·m (77 lb·ft) @ 2,600 rpm |
| Bore | 83 mm, |
| Stroke | 69 mm, |
| Compression ratio  | 7.5:1 |
| Transmission | 4-speed manual |
| Wheelbase | 2,400 mm (94.5 in) |
| Length | 4,079 mm (160.6 in) |
| Width | 1,539 mm (60.6 in) |
| Weight | 840 kg (1,900 lb.) |

### VW 1302 & VW 1303 – The Super Beetle



In 1971, alongside continued production of the "standard" Beetle, a Type 1 variant that featured a MacPherson strut front suspension and redesigned front end was also produced. Officially known (and marketed in Europe) as the VW 1302 from 1971 to 1972, and VW 1303 from 1973 onwards, but commonly called Super Beetle, the new stretched nose design replaced the dual parallel torsion bar beams which had compromised trunk space and relocated the spare tire from a near vertical to a low horizontal position. The redesign resulted in a tighter turning radius despite a 20 mm (0.79 in) longer wheelbase, and a doubling of the front compartment's cargo volume. As with previous models, air pressure from the spare tire pressurized the windshield washer canister, in lieu of an electric pump.

1972 Super Beetles had an 11% larger rear window (4 mm (0.16 in) taller), larger front brakes, four rows of vents (versus two rows previously) on the engine deck lid, tail lights incorporating reverse lights, a four-spoke energy-absorbing steering wheel and steering column, and an engine compartment socket for a proprietary VW Diagnosis system.

In 1973, the VW 1303 introduced a curved windscreen, pushed forward and away from the passengers, allowing a redesigned, padded dashboard to replace the pre-1973 vertical dash. A two-speed heater fan, higher rear mudguards, and larger tail lights were added. The changes to the heater/windshield wiper housing and curved windshield resulted in slight redesign of the front hood, making the 1971 and 1972 Super Beetle hoods unique.

For 1974, the previous flat steel bumper mounting brackets were replaced with tubular "self-restoring energy absorbing" attachments”, effectively shock absorbers for the bumpers, on North American market Beetles. These cars also got stronger "5 mph" bumpers that added an inch to the length of the car. The steering knuckle, and consequently the lower attachment point of the strut, was redesigned to improve handling and stability in the event of a tire blowout. This means struts from pre-1974 Super Beetles are not interchangeable with 1974–79s.

1975 models featured Air Flow Control (AFC) Fuel Injection on U.S., Canadian, and Japanese Beetles, a derivative of the more complex Bosch fuel injection system used in the Volkswagen Type III – and equivalent to Bosch L-Jetronic. The fuel-injected engine also received a new muffler and the option of an upstream catalytic converter required on some models (e.g. California), necessitating a bulge in the rear apron sheet metal directly under the rear bumper, and replacing the distinctive dual "pea shooter" pipes with a single offset tailpipe – making fuel-injected models identifiable at a glance. Other changes were rack and pinion steering replacing the traditional worm and roller gearbox on Super Beetles, and larger license plate lamp housing below the engine lid. The front turn indicators were moved from the top of the fenders into the bumper bars on European models.

In 1976, the optional Autostick transmission and the Super Beetle sedan were discontinued, with VW continuing to market the standard sedan and VW 1303 convertible. From 1976 onwards convertibles received no significant engineering changes, only a few cosmetic touches and new paint options, including the "Champagne Edition" models (white on white was one example) to the final 1979 "Epilogue Edition" black on black, in salute to the first Beetles produced in the 1930s. 1977 model sedans received front seats with separate head restraints.

### VW 1303 Cabriolet



The Beetle Cabriolet began production in 1949 by Karmann in Osnabrück. It was in 1948 when Wilhelm Karmann bought a VW Beetle sedan and converted it into a four-seated convertible. After successfully presenting it at VW in Wolfsburg, production started in 1949. After a number of stylistic and technical alterations made to the Karmann cabriolet, (corresponding to the many changes VW made to the Beetle throughout its history), the last of 331,847 cabriolets came off the conveyor belt on 10 January 1980.

### Decline

Though extremely successful in the 1960s, the Beetle was faced with stiff competition from more modern designs. The Japanese had refined rear-wheel-drive front-engine water-cooled small cars so that they sold well in the North American market, and Americans introduced their own similarly sized rear-wheel-drive Chevrolet Vega, Ford Pinto and AMC Gremlin in the 1970s. The super minis in Europe adopted even more efficient transverse-engine front-wheel-drive layouts, and sales began falling in the mid-1970s. There had been several unsuccessful attempts to replace or supplement the Beetle in the VW product line throughout the 1960s; the Type 3, Type 4, and the NSU-based K70 were all less successful than the Beetle, though aimed at more upscale markets for which VW lacked credibility. The over-reliance on the Beetle meant that Volkswagen was in financial crisis by 1974. It needed German government funding to produce the Beetle's replacement. Only when production lines at Wolfsburg switched to the new water cooled, front-engine, front-wheel drive Golf designed by Giorgetto Giugiaro in 1974, (sold in North America as the "Rabbit") did Volkswagen produce a car as successful as the Beetle. The Golf would be periodically redesigned over its lifetime – entering its sixth generation in 2008 – with only a few components carried over between generations, while the Beetle had only minor refinements of its original design.

The Golf did not kill Beetle production, which continued in smaller numbers at other German factories until 19 January 1978, when mainstream production shifted to Brazil and Mexico - markets where low operating cost was important. The Beetle Cabriolet was produced for the North American and European markets in Germany until 10 January 1980. The last Beetle was produced in Puebla, Mexico, in July 2003. The final batch of 3,000 Beetles were sold as 2004 models and badged as the Última Edición, with whitewall tires, a host of previously discontinued chrome trim, and the choice of two special paint colours taken from the New Beetle. Production in Brazil ended in 1986, then started again in 1993 and continued until 1996. Volkswagen sold Beetle sedans in the US until August 1977 (the Beetle convertible/Cabriolet was sold until January 1980) and in Europe until 1985, with private companies continuing to import cars produced in Mexico after 1985.

The Beetle outlasted most other cars which had copied the rear air-cooled engine layout such as those by Subaru, Fiat, and General Motors. Porsche's sport coupes which were originally based on Volkswagen parts and platforms continue to use the classic rear engine layout (which later became water-cooled) in the Porsche 911 series, which remains competitive even well into the 21st century.

### Worldwide end of production

By 2002, over 21 million Type 1s had been produced, but by 2003, annual production had dropped to 30,000 from a peak of 1.3 million in 1971. VW announced the end of production in June 2003, citing decreasing demand, and the final original Type 1 VW Beetle (No. 21,529,464) rolled off the production line at Puebla, Mexico, on 30 July 2003 65 years after its original launch and unprecedented 58-year production run (counting from 1945, the year VW recognizes as the first year of non-Nazi funded production). This last Beetle, nicknamed El Rey (Spanish for "The King" after a legendary Mexican song by José Alfredo Jiménez) was delivered to the company's museum in Wolfsburg, Germany.

To celebrate the occasion, Volkswagen marketed a final special series of 3,000 Beetles marketed as "Última Edición" (Final Edition) in light blue (Aquarius Blue) or beige (Harvest Moon Beige). Each car included the 1.6 engine, whitewall tires, a CD player with four speakers, chrome bumpers, trim, hub caps and exterior mirrors, a Wolfsburg emblem above the front trunk's handle, chrome glove box badge, body coloured wheels, tinted glass, a rear parcel shelf, and VW Última Edición plaque.

A mariachi band serenaded production of the last car. In Mexico, there was an advertising campaign as a goodbye for the Beetle. In one of the ads was a very small parking space on the street, and many big cars tried to use it, but could not. After a while, a sign appears in that parking space saying: "Es increíble que un auto tan pequeño deje un vacío tan grande" (It is incredible that a car so small can leave such a large void). Another depicted the rear end of a 1954 Beetle (the year Volkswagen was established in Mexico) in the left side of the ad, reading "Erase una vez..." (Once upon a time...) then on the right side the last 2003 Beetle, reading "Fin" (The end). Other ads appeared around the same time with the same nostalgic tone.

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| Última Edición |
| Engine | Fuel-injected (Bosch Digifant) four-cylinder horizontally opposed1,584 cc50 BHP (37 kW)98.1 N·m (72.4 lb·ft) @ 2,200 rpmthree-way catalytic converter |
| Rated fuel mileage | 39.0 mpg |
| Max Cruising Speed | 130 km/h (81 mph) |
| Brakes | Front - discRear - drum |
| Passengers | 5 |
| Tank | 40 L (9 gal) |
| Colours | Aquarius blueHarvest Moon beige |

## The Beetle in other countries

Many other countries produced Beetles from CKD (complete knockdown kits). Ireland, Thailand, Indonesia, South Africa, Australia, and Nigeria have all assembled Beetles under license from VW.

The Beetles produced in Mexico and Brazil had several differences

### Brazil

Brazilian assembly of the Beetle, where it is called "Fusca", started in 1953, with parts imported from Germany. By 1959, the cars were 100% Brazilian made. Production continued until 1986. In 1993 production resumed and continued to 1996. The Brazilian version retained the 1958–1964 body style (Europe and U.S. version) with the thick door pillars and smaller side windows. This body style was also produced in Mexico until 1971. Around 1973, all Brazilian Beetles (1300 and 1500 series) were updated with the 1968-up sheet metal, bumpers, and four-lug rims; although the five-stud rims and "bug-eyed" headlights were produced as late as 1972 (the base VW 1200 and 1300 manufactured in Brazil was similar to the 1964 European/U.S. 1200 until the 1970 model year but came with vented wheels since the mid-1960s). The 1971 and 1972 1200s and 1300s had the 1964-era taillights and headlights, fuel tank, but fitted with the 1968-up raised bumpers. Brazilian CKD kits were shipped to Nigeria between 1975 and 1987 where Beetles were locally produced. The Brazilian-produced versions have been sold in neighbouring South American nations bordering Brazil, including Argentina, Uruguay, and Peru.

The Brazilian Type 1s have four different engines: 1,200 cc, 1,300 cc, 1,500 cc, and 1,600 cc. In the 1970s, Volkswagen made the SP-2 (derived from the Type 1 pan and the Type 3 powertrain) with a 1,700 cc engine (a bored-out 1,600 cc). In Brazil, the Type 1 never received electronic fuel injection, instead retaining carburettors (one or two one-barrels) throughout its entire life, although the carburetion differs from engines of different years and specification.

The production of the air-cooled engine finally ended in 2006, after more than 60 years. It was last used in the Brazilian version of the VW Bus, called the "Kombi", and was replaced by a 1.4 L water-cooled engine with a front-mounted cooling system.

### Southern Rhodesia

The Volkswagen Type 1 chassis was used as the basis for a mine-protected APC called the Leopard security vehicle and the Pookie demining vehicle, fielded by the Republic of Rhodesia during the Rhodesian Bush War.

### Mexico



Mexican production began in 1955 because of agreements with companies such as Chrysler in Mexico and the Studebaker-Packard Corporation which assembled cars imported in CKD form. In 1964, they began to be locally produced. These models have the larger windshield, rear window, door and quarter glass starting in 1971; and the rear window from 1965 to 1971 German built models was used on the Mexican models from 1972 to 1985, when it was replaced with the larger rear window used on 1972 and later German built Beetles. This version, after the mid-1970s, saw little change with the incorporation of electronic ignition in 1988, an anti-theft alarm system in 1990, a catalytic converter in 1991 (as required by law), as well as electronic Digifant fuel injection, hydraulic valve lifters, and a spin-on oil filter in 1993. The front turn signals were located in the bumper instead of the Beetle's traditional placement on top of the front fenders from the 1977 model year on, as they had been on German Beetles sold in Europe of the same time period. Starting in 1995, the Mexican Beetle included front disc brakes, an alternator instead of a generator, and front automatic seat belts. Starting with the 1996 model, the chrome mouldings disappeared leaving body coloured bumpers and black mouldings instead. By the end of the 1996 model year, exterior chrome or matt mouldings were dropped altogether and for model year 1997 Volkswagen de Mexico (VWdM) dropped the Sedan's flow-through ventilation system with all its fittings, notably the exterior crescent-shaped vents behind the rear side windows.

In mid-1996, front drum brakes and fixed front seat belts were re-launched in a new budget version called the "Volkswagen Sedán City", which was sold alongside the upscale version "Volkswagen Sedán Clásico" which had front disc brakes, automatic seat belts, right side mirror, velour upholstery, optional metallic colours and wheel covers in matte finish (also found on some 1980s Beetles and Buses). These two versions were sold until 1998. From late 1998–2003, The Sedán Clásico was discontinued and the Sedán City lost its prefix and gained disc brakes, automatic seat belts and optional metallic colours. This last version was named the "Volkswagen Sedán Unificado" or simply the "Volkswagen Sedán".

Independent importers continued to supply several major countries, including Germany, France, and the UK until the end of production in 2003. Devoted fans of the car even discovered a way to circumvent US safety regulations by placing more recently manufactured Mexican Beetles on the floor pans of earlier, US-registered cars. The Mexican Beetle (along with its Brazilian counterpart) was on the US DOT's (Department of Transportation) hot list of grey market imports after 1978 as the vehicle did not meet safety regulations.

In the Southwest US (Arizona, California, New Mexico, and Texas), Mexican Beetles (and some Brazilian T2c Transporters) are fairly common sights since Mexican nationals can legally operate the vehicle in the United States, provided the cars remain registered in Mexico.

The end of production in Mexico can be attributed primarily to Mexican political measures. The Beetles no longer met emissions standards for Mexico City, in which the ubiquitous Beetles were used as taxicabs; and the government outlawed their use as taxicabs because of rising crime rates, requiring only four-door vehicles be used. The last Vocho taxis in Mexico City are set to be retired at the end of 2012. In addition, Volkswagen (now Germany's largest automobile maker) has been attempting to cultivate a more upscale, premium brand image, and the humble Beetle clashed with this identity, as seen in the Touareg and Passat luxury vehicles. In the late 1990s consumers strongly preferred more modern cars such as the Mexican Chevy, the Nissan Tsuru, and the Volkswagen Pointer and Lupo.

However, demand for the Beetle was relatively high, especially in the 1990s, with the workforce increasing at the start of the decade. The price of the single basic model (without even a radio) was pegged with the official minimum wage, by an agreement between the company and the government. In 1990 it cost $5,300(USD).

### Australia

Official importation of the Volkswagen Beetle into Australia began in 1953, with local assembly operations commencing the following year. Volkswagen Australia was formed in 1957, and by 1960 locally produced panels were being used for the first time. Australian content had reached almost 95% by 1967. However, declining sales saw the company revert to using imported components the following year. In 1976, Volkswagen ceased Australian assembly operations, their factory in Clayton, Victoria was sold to Nissan Australia (which is now occupied by Holden Special Vehicles), and all Volkswagens were once again fully imported.

### South Africa

The Volkswagen Beetle was also produced in South Africa at the Uitenhage plant.

## Motorsport

### Drag racing

The Beetle is widely used in drag racing where its rearward (RR layout) weight distribution keeps the weight over the rear wheels, maximizing grip off the starting line. The car's weight is reduced for a full competition drag Beetle, further improving the grip and also the power-to-weight ratio. Combined with the Beetle's RR layout, wheelies can be achieved easily, but time "in the air" worsens 1/4 mile time. To prevent this, "wheelie bars" are usually added.

### Formula Vee

The Beetle is also used as the basis for the Formula Vee open-wheel racing category – specifically, the front suspension cross member assembly (the shock absorber mounts are sometimes removed, depending on regulations in the class), and the engine and transaxle assembly (usually the earlier swing-axle type, not the later double-jointed axle). In original 1,200 cc Formula Vee spec, upgrades to the cars would only be allowed sparsely, so that the wheels, tires and engines didn't differ very much from the original Beetle. At the end of the 1960s, Vee Beetle engine output on a single carburettor would reach up to 70 BHP; top speeds would gradually rise to nearly 200 km/h (124 mph). In this configuration, FV would become one of the most popular entry-level motorsports classes of its time.

Later on, double carbs and more extensive modification would be allowed, leading to the more powerful Super Vee class featuring wings for down force and 123 BHP (92 kW; 125 PS) engines, which in the end had fairly little in common with the original VW Bug. Around 2000, worldwide Vee racing had re-established itself as a 1,200/1,300 cc beginner class with wingless cars and VW engines outputting about 60 BHP (45 kW; 61 PS), but incorporating more modern chassis and tyres.

### Uniroyal Fun Cup

Volkswagen Beetle-style bodies are fitted to space frame racing chassis, and are used in the Uniroyal Fun Cup, which includes the longest continuous motor-race in the world, the 25 Hours of Spa. It is an affordable entry-level series.

### Rally and Rally Cross

Especially the Austrian sole distributor Porsche Salzburg (now Porsche Austria) seriously entered the Volkswagen in local and European contests in the 1960s and early 1970s. Starting with the VW 1500, in the mid-1960s the peak of their racing performance was achieved with the VW 1302S and VW 1303S (known as the Salzburg Rally Beetle) from 1971 to 1973. The vehicles were entered in such famous races as TAP (Portugal), Austrian Alpine, Elba and Acropolis. Drivers were top performers such as Tony Fall (GB), Guenter Janger (AUT), Harry Källström (S), Achim Warmbold (D), Franz Wurz (A), etc. The engines were highly modified 1600's delivering 125 BHP (93 kW) later mated to a Porsche 914 five-speed manual gearbox. Victories were achieved in 1973 on Elba for overall and class, Acropolis for class (5th overall), Austrian championship 1972, 1973 January Rally for overall and class.

The fuel crisis, along with the arrival of the Volkswagen Golf (Rabbit), put an end to the days of unofficially supported rallying in 1974. All vehicles either used for training or actual racing were sold off to privateers many kept racing with noticeable results until the early 1980s.

### Trans Am Series

Beetles were used in The Trans-Am Series for the two-litre class from 1966 to 1967 and again in 1972.

### Baja 1000



The Baja 1000 off-road race in the Baja California Peninsula, Mexico includes specific vehicle classes for both standard Beetles and Baja Bugs. As shown in the documentary movie Dust to Glory. The classes range from Class 5 Unlimited Baja Bugs through to Class 11 Stock VW Sedans

### Beetle Challenge

The Beetle Challenge is a UK-based circuit racing championship for classic air-cooled Volkswagen Beetles. The general concept is to take any Beetle, of any age or model from the 40s through to 1303s, and with minimal restrictions, allowing parts from various years to be interchanged, and of course the cars being prepared to the MSA safety requirements (cage, restraints, fire system etc.) The cars must be air-cooled Beetles (any age and parts can be swapped between years and models), with a 15-inch x 6-inch max wheel size with a control tyre. Engines must be based on a Type 1 engine case, with no electronic fuel injection or ignition and no forced induction, with an unlimited capacity. Other regulations apply.

## In popular culture

Like its contemporaries, the Mini, the Citroën 2CV, and the Fiat 500, the Type 1 has long outlasted predictions of its lifespan. It has been regarded as something of a "cult" car since its 1960s association with the hippie movement and surf culture; and the obvious attributes of its unique and quirky design (the Beetle could float on water thanks to its sealed floor pans and overall tight construction, as shown in the 1972 Volkswagen commercial).

Much like their Type 2 counterparts, Beetles were psychedelically painted and considered an ancestor of art cars. Currently, there is a wide array of clubs that are concerned with the Beetle. Part of their cult status is attributed to being one of a few cars with an air-cooled, horizontally opposed engine design, and the consequent ease of repair and modification, as opposed to the more conventional and technically complex water-cooled engine design. The original flat-four boxer design had fewer than 200 moving parts.

The Beetle has made numerous appearances in Hollywood films, most notably (Disney's) The Love Bug comedy series from 1968 to 2005, starring as "Herbie", a pearl-white, fabric-sun roofed 1963 Beetle—racing number 53. In the plot of the 1973 Woody Allen film Sleeper, Allen's character was able to instantly start a Beetle which lay hidden and unused in a cave for 200 years, leading to the punch line "Wow, they really built these things, didn't they?" The race cars in the 1975 action-comedy film Death Race 2000 were actually Type 1s with outlandish customized bodies. In the 1984 series The Transformers character Bumblebee transformed into a Beetle, as well fellow Autobot Glyph and the Decepticon Bugbite. In 2006 animation Cars, every bug or insect is represented by a Type 1.