

Vanagon

The creation of a
Volkswagen original.



The behind-the-scenes story of
the creation of a completely new
van-wagon by the company that
pioneered the economy
transportation concept over
30 years ago.

A Volkswagen original for the '80s.

This book is the story of how Volkswagen engineers and designers created and built Vanagon, another Volkswagen original. More spacious, More comfortable, More drivable.

Volkswagen's completely new Vanagon and Vanagon Camper for the '80s carry over very little from the venerable Bus.

The proven 2-liter air-cooled, fuel-injected engine is there, albeit further improved. The industry's first sliding side door has also been retained, but enlarged to accommodate a more spacious opening.

Most everything else is new.

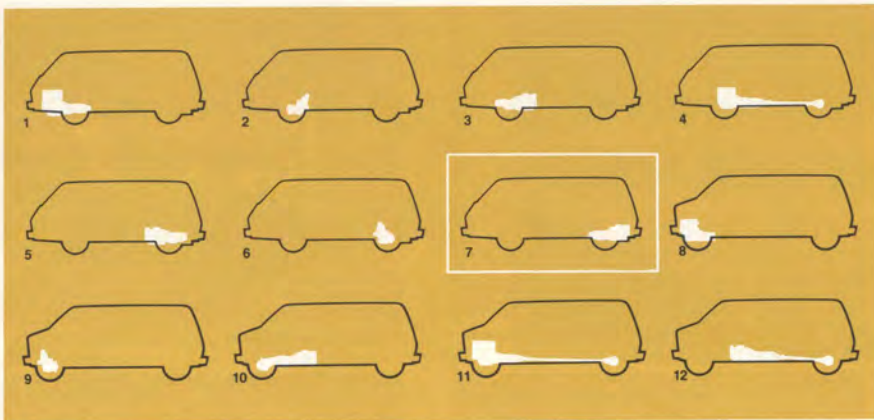
The first VW Bus was introduced in 1950 and has run up a production record of 5.5 million units.

That will be the act to follow.

To do the job, Volkswagen has invested well over a quarter of a billion dollars in developing Vanagon and putting it into production.

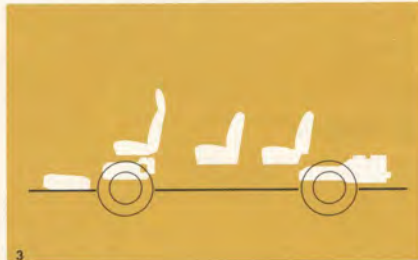
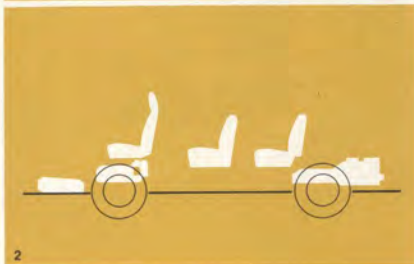
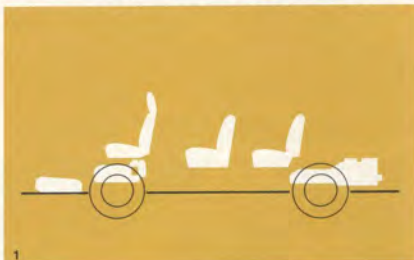
That the money was well spent becomes obvious as one gets to know Vanagon. The completely new seven-to-nine-passenger original for the '80s.





Analyzing a total of twelve design configurations and drive train concepts provided the basis for selection of No. 7, rear engine/rear wheel drive.

Volkswagen engineers designed the Vanagon so that (1) at half payload, it provides optimal 50/50 front to rear weight distribution (2). Seats and controls were ergonomically located (3) to minimize driver and passenger fatigue. The body shell (4) had to be pleasing to the eye, as well as aerodynamically correct.



A Volkswagen original takes shape.

The requirements for VW's van-wagon for the '80s were easy to see, though not simple to achieve: More space and greater fuel efficiency* than some of the large station wagons. Better handling, greater comfort, and better finish than a Van. In essence, the best of a van combined with the best of a wagon!

Before Vanagon's designers and engineers committed their first sketches to paper, they considered a dozen different vehicle concepts, as seen above left.

These were ranked according to 52 criteria. From performance and space utilization, to comfort, economy, and versatility.

The decision *not* to opt for front engine/front-wheel drive, the configuration used in all other new generation VWs, was based on painstaking value analysis. Conventional front engine layouts produced clearly less favorable results for this type of vehicle.

Here are some of the key telling advantages that led to the selection of the Vanagon layout.

Fully 68% of the road space occupied by Vanagon is usable interior space. This compares favorably with the 56% available with conventional short-hooded, front engine/rear drive layouts favored by domestic makers.

At half payload, for instance, Vanagon provides optimal 50/50 front to rear weight distribution.

Vanagon is at a distinct advantage compared with front engine/rear drive vans when climbing hills and in difficult terrain, such as slippery, muddy or snow-covered roads, because Vanagon's engine and transmission add weight over the driven rear wheels, enhancing traction.

*Estimated mpg **17** . Highway estimate 25.

Use "estimated mpg" for comparisons to other cars. Mileage varies with speed, weather, and trip length. Actual highway mileage will probably be less.

With the drive train configuration decided upon, Volkswagen's designer team turned its attention to the suspension and chassis. Here the goal was to achieve drivability and handling beyond that of any comparable vehicle.

A measure of their success is Vanagon's capability of registering 0.70 lateral g forces on the skid pad. This figure compares favorably with many passenger sedans.

This is achieved, in part, through the use of a completely new suspension system. Unequal length control arms, progressive coil springs, telescopic shock absorbers, and an anti-roll bar control the front wheels.

In the rear, semi-trailing arms in combination with progressive coil springs and double acting hydraulic shock absorbers make up the independent wheel suspension.

To make Vanagon as responsive as possible, a unique rack and pinion steering system has been developed.

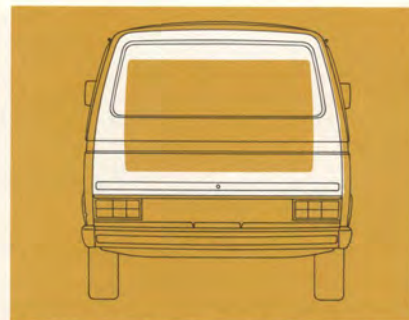
The turning radius, wall to wall, has been shortened to 34.5 feet, not much more than that of a Rabbit. And the combination of a wider stance and longer wheelbase makes Vanagon's ride more like that of a large sedan than that of a van or wagon.

Volkswagen designers also re-examined the question of driver and passenger comfort in designing Vanagon's interior.

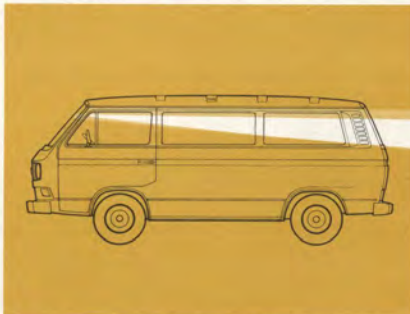
To help minimize driver fatigue, controls, instruments, and the driver's seat have been ergonomically positioned to suit about 95% of the population.



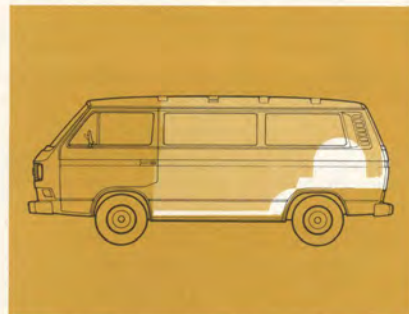
Total glass area in the Vanagon is 22% larger than in the old VW Bus.



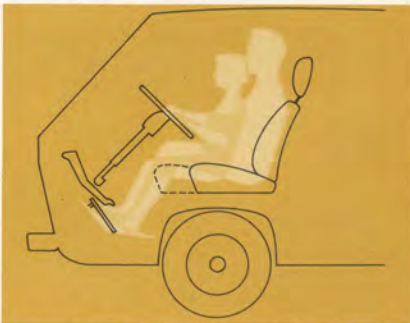
The spacious rear hatch opening is 75% larger.



The 50% larger rear window provides a full view of the road behind.



Lowering floor and engine compartment increasing interior capacity by 40%.



Steering wheel angle, pedal height and seating were ergonomically designed to suit about 95% of the population.



An advanced holographic technique measures stress and deformation. Shown here: Vanagon's transverse linkage.



Sound-deadening insulation was put to the test in an acoustical chamber.



The wind tunnel's flow pattern demonstrates Vanagon's aerodynamic structural soundness.

Turning vanes in the tunnel chamber can accelerate the wind stream to 112 mph.



Vanagon's trim is on a par with that of fine European sedans. Good quality materials are finished with great care. The headliner is hand-fitted. For added visibility, the glass area has been greatly increased.

For all-weather comfort, an efficient flow-thru ventilation system is capable of changing the air in the front compartment every 18 seconds at highway speeds of 55 miles per hour.

The heating system is designed to raise the interior temperature to a comfortable 68°F in just 10 minutes from a cold start, even when outside temperatures are as low as 32°F.

A wide side door and a rear hatch ease entry and exit. The trunk over the engine compartment measures a huge 49.7 cubic feet and, with the rear bench folded, offers an unbelievable 92.9 cubic feet.

The Vanagon body shell was designed with the assistance of a computer, using graphic projections. All design data were fed into a second computer that controls a driving simulator. This sophisticated test instrument revealed Vanagon's basic handling characteristics—even before the first prototypes were built.

Aerodynamic work was carried out in Europe's largest climatic wind tunnel, the massive VW installation at Wolfsburg.

After thousands of hours of testing, changing and testing again, Vanagon's drag coefficient was reduced to a mere 0.44. This figure compares favorably with many sedans, and is below that of conventional vans. It contributes considerably to Vanagon's fuel efficiency.

A frame-like base, welded to the floor of the monocoque steel body shell, gives Vanagon outstanding torsional stiffness. It also helps reduce squeaks and rattles.

Like all new vehicles from Volkswagen, Vanagon has to prove itself by overcoming the incredible rigors of Ehra-Lessien before going into production.

Ehra-Lessien, Volkswagen's 11-million square meter proving ground is among the most demanding in the world. And equally impressive are the computer-controlled testing and measuring facilities.

But a test track and computer can only tell part of the story. So Vanagon was driven during an entire winter in Sweden and in the summer heat of the Sahara desert to test its ability to perform and survive under a wide range of environmental conditions.

In sum, Vanagon has been thoroughly tested throughout every stage of development prior to going into production.



Proven at Ehra-Lessien: Wider track, longer wheelbase and a well positioned center of gravity combine to give Vanagon cornering characteristics akin to some sedans.



Vanagon passed thousands of miles of testing at Ehra-Lessien, Volkswagen's massive all-weather proving ground.



Vanagon's near 50/50 axle load distribution provides consistent, predictable handling.



Complete renewal of air in cab every
18 seconds at speeds of 55 mph

Five assist handles

21% larger windshield and 22% greater
side window glass area

Vent windows in front and side doors
(Rear vent windows are sliding type)

Electric windshield washer

Steering column offset
for comfort

Controls laid out
according to ergonomic
principles

Rack and pinion
steering with relay
gear box

Massive bumpers and
full-width deformation
elements up front

Spare wheel out of
the way under cab

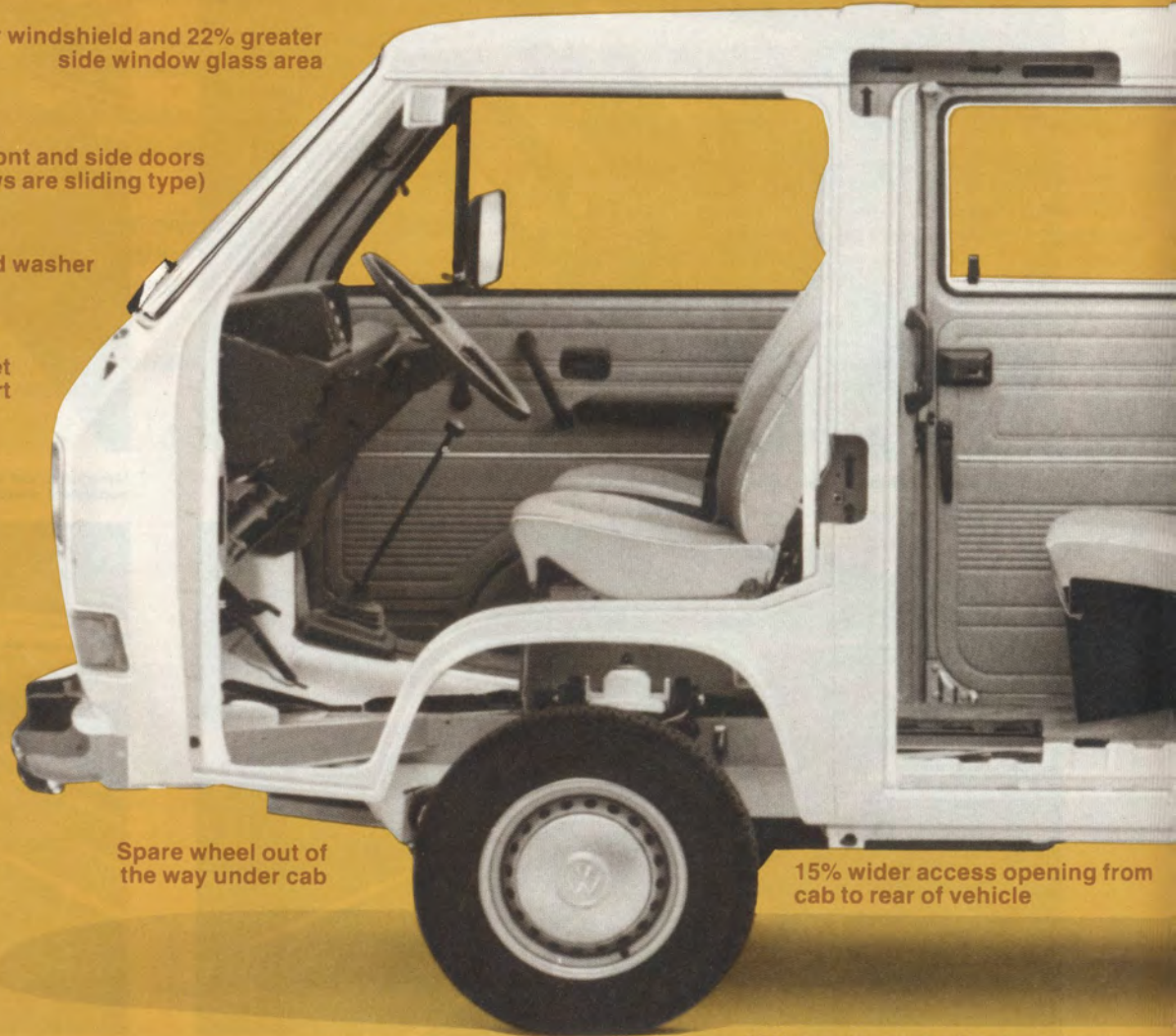
15% wider access opening from
cab to rear of vehicle

20% smaller turning radius

15.8 gallon fuel tank
moved forward to
increase load space

25% greater seat adjustment range

Independent front



Tasteful interior trim

15% larger sliding side door

Poly-foam seat padding

Over 200-cubic feet
of total capacity

75% larger rear hatch

92% larger rear window

Electric rear window
defroster/defogger

40% larger luggage
compartment

Lower floor for larger loads

Advanced design, low
profile fuel-injected engine

Inertia-controlled rear
brake pressure regulator

Bitumen wax base underseal for
added corrosion protection

Radial tires

Fold-down rear bench seat
increases load capacity

Fit and finish on a par
with fine European sedans

Light curb weight, just 3,087 lbs.

and rear suspension

All comparisons are to a 1979 Volkswagen Bus.



Building a Volkswagen original.

State of the art technology is also part of Vanagon production.

Some \$21 million was spent to develop industrial robots for the Hannover plant. Yet, much of the finishing and fitting is still done with human hands.

Nicknamed "Robbies", 44 robots have taken over repetitive, often physically demanding operations.

In addition, there are also 14 large, high-capacity **automatons** nicknamed "Golies" after the biblical giant Goliath. These are used to automate the Vanagon body assembly line.

A welding carousel begins the manufacturing process by turning out a Vanagon front end. Others turn out the side panels and floor sections.

These subassemblies come together in a large fixture controlled by a process computer. At the command of an electronic signal the welding begins. In a matter of seconds, hundreds of spot welds have been completed and the basic monocoque shell has been formed.

At the end of the line, a team of inspectors examines welds and fit.

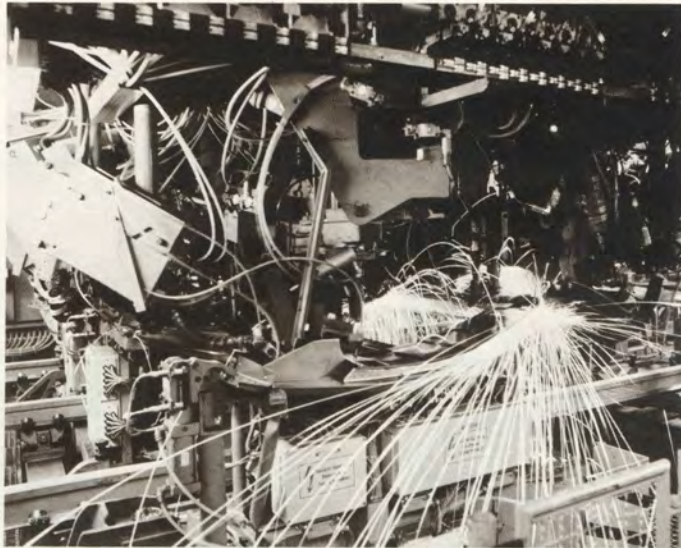
Following the addition of doors and hatch cover, plus hand welding and brazing to further reinforce the shell,



Hand welding and brazing.



Inspectors checking finish before paint line.



In seconds, robots accurately complete hundreds of pre-determined spot welds.

A paint inspector checks the finish.





Hand touch-up on the Vanagon's paint finish.

Close-up of Vanagon robot assembly line.

A special team checks wheel alignment.



a team of body finishers searches for irregularities and makes the necessary corrections.

After a steaming hot detergent shower to remove grease, fine dirt and metal filings, it receives a matte grey protective coating, followed by two thorough wash-downs and a final shower in water that has been desalinated.

The initial painting is done by an electrocoating process. The entire shell is dipped into a tank containing a solution of 10% paint, 90% water, and paint is deposited on the body by an electric current, evenly covering even the remotest areas of the body shell.

After further finishing, the body shell is ready for final spray painting in its chosen color, and the automatic spraying equipment begins its work. From here, the final coat of paint is baked at a temperature of 140°C.

After final inspection, the finished body is ready to move on to the final assembly lines.

Finished body shells, with cavities sealed with a wax-based preservative to guard against corrosion, arrive at the final assembly line. Here they are transformed into finished Vanagons and semi-finished Vanagon Campers that will be shipped to Westfalia for final assembly.

During this process, a combination of automated equipment and skilled hand labor turns out vehicles complete with oil and fuel, ready to be driven off the end of the assembly line and to be taken through a wax spray booth.

The engine compartment is sprayed to resist corrosion, and an additional thick coat of bituminized wax is applied to the underside. This helps protect against flying stones and winter salts.

Completed Vanagons are now ready for shipment while Vanagon Campers, at this point only in semi-finished state, will move on to Westfalia where camping gear will be installed.

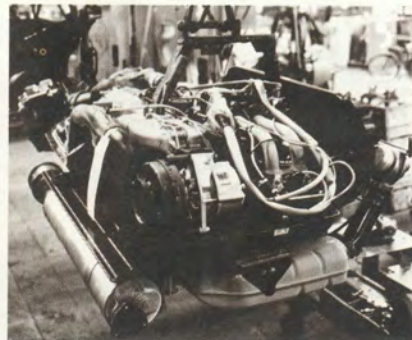


Hand spraying is still an important part of Vanagon's modernized paint line.

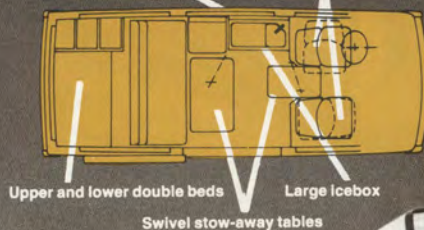
A worker masks the body prior to application of a second color.



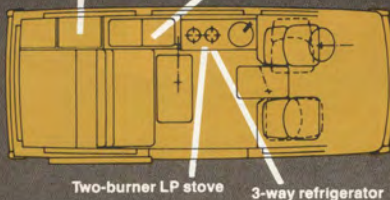
The new flatter "pancake" engine ready for installation.



VANAGON CAMPER MODEL P22
External water hook-up, std. Swivel front bucket seats, std.



VANAGON CAMPER MODEL P27
Hanging locker 40-liter water tank



A Volkswagen original becomes a camper.

Nearly thirty years ago, when Volkswagen decided to make its first camper, it was natural to turn to Westfalia-Werke to do the outfitting. A tradition of hand craftsmanship and quality still pervades everything the firm does.

Basic Vanagons arrive at Westfalia with the front seats, dashboard and engine in place.

These skilled craftsmen transform it into a commodious camper.

As it moves down the assembly line, its flooring, electrical wiring and plumbing, paneling, cabinetry, kitchen equipment, and convertible sleepers are added.

Of course, the big difference between Vanagon Campers and others is our pop-top. You get plenty of headroom above the food preparation area and at the access to the upper double bed.

At the final station, a VW quality control inspector carefully checks the entire unit. Only when he is satisfied will Volkswagen accept delivery of the vehicle.

Eating and sleeping are "on the house" when you take your Vanagon Camper along.

These days, motels and restaurants represent a steeply rising cost that can put a crimp in anyone's travel plans. And many times, you can waste precious hours looking for a place that suits you. Vanagon saves you time and money and solves your problem luxuriously and comfortably.

What's the difference between our two camper models? Mostly it's cooking the meals and storing them. The more luxurious P27 comes with a 3-way refrigerator and a 2-burner propane stove; P22 has a large, economical icebox.

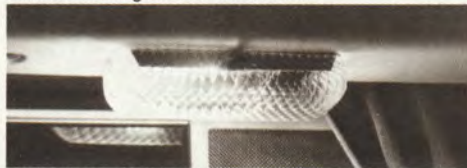
All Vanagon Campers provide double beds—one above and one below. And there's storage virtually everywhere. No nook is wasted.

Today, most recreation vehicles are too heavy for contemporary travel styles and high gasoline prices. Vanagon, on the other hand, is an ideal traveling companion.

Before you head to the great outdoors, take a close look at Vanagon Camper. You may find you're ready to take along a very commodious companion.



Additional storage in roof rack over cab.



12V light over sink, standard.



Swivel seats and swivel table, both standard.



Large rear swivel table. Salad is served!



Bedding stores below rear seat.

**Neat,
convenient,
enjoyable.**

Clothing, bedding, and personal items stow neatly and out of the way in the abundant storage space provided in Vanagon Campers. Everything is easy to reach whenever you need it. Swing-away swivel tables have no legs or pedestals to get in your way.



3-level rear closet.



Roof storage and wardrobe with large mirror, standard.



Model P27 has a 3-way refrigerator and a 2-burner cookstove.



Kitchen drawer and pantry hold a lot.



Lower double bed. Add your own bedding.



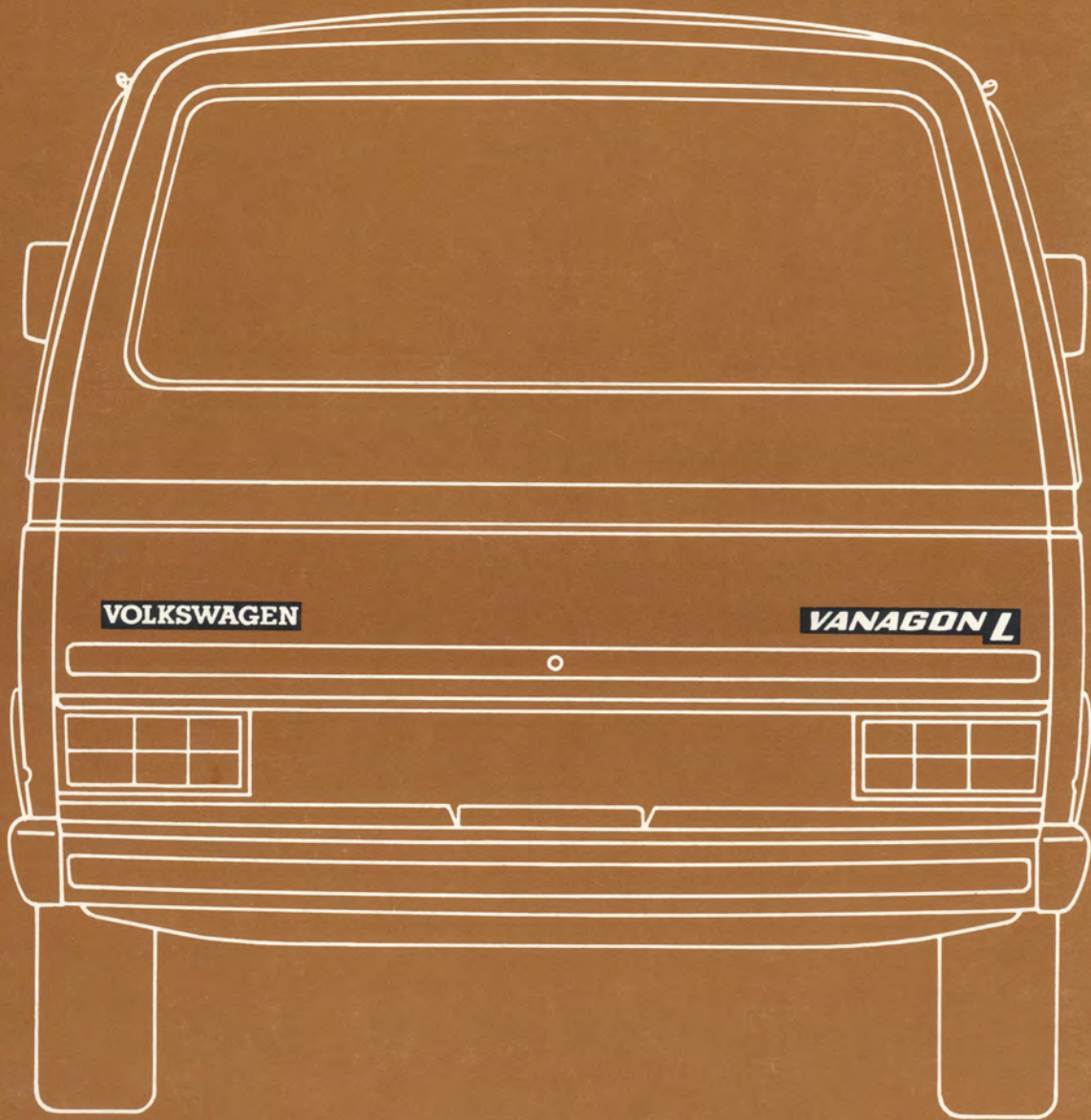
Upper double bed. Enough headroom here.



Fire extinguisher is standard on Model P27.

**VOLKSWAGEN
DOES IT
AGAIN**





**SILVER
ANNIVERSARY
VOLKSWAGENS**