

Karl Ludvigsen
answers your questions
about SAAB cars





KARL ERIC LUDVIGSEN—

was born in Michigan—not Sweden—three years before the SAAB company was founded. He first read about a SAAB car, the 92, in Britain's *Motor* in 1950 and was fascinated by its clean shape and shrewd engineering. Karl visited SAAB in 1960 and again in 1969, bringing back vivid memories of hairy rides over rally roads, courtesy of Carl-Magnus Skogh, Rolf Mellde and Eric Carlsson. As a free-lance writer for auto magazines in the U.S. and as a correspondent for publications in a dozen countries abroad, Karl writes more than seventy articles a year about the subject that interests him most: automobiles.

Why should I read this book about SAABs?

This is a book of answers to questions, so let's start it with another question: Can any number of words and pictures take the place of a test drive in a SAAB? The answer to this one is easy: No. More than most other cars, a SAAB deserves and rewards your detailed personal inspection. Only behind the wheel can you begin to appreciate how good a SAAB car is.

Unless you're taking your dealer for a ride, though, a test drive is too short to allow you to get to know these cars well. This book is designed to give you a head start. If you read it before you try a SAAB you'll know what to look for. If you read it after you've bought a SAAB you'll find out why the car is so consistently satisfying. And if you're reading it between planes in Atlanta I hope it will pleasantly pass the time.

I've tried to anticipate some of the questions you may ask about SAABs. Check them against the list at the right, then go directly to the section of your choice. You'll find an answer, including some fascinating facts about SAAB of Sweden, one of the world's most unusual automakers. If you have some other questions I haven't covered, ask your dealer, then try one of his SAABs. They're the cars that have all the answers.

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Why is a SAAB so small?



One of the factory men I talked to put it well, if formally: "The SAAB is the only *true* compact car." Another put it more personally: "SAAB is like a woman's shoe. It looks small but it holds a lot." That says it, though I don't agree that the new 99 looks small. Its fine style gives it a character and presence most smaller cars lack.

The men of SAAB took a remarkably long-range view of the 99's design. When they bring out a new model, it has to last for a few years. The 99 may still be with us ten years from now. Considering this, they measured and shaped it to suit the dense traffic, crowded streets and cramped parking of the Europe of ten years from now—which is to say, the America of today. Driving a SAAB is like adding an extra lane to every road.

SAAB engineers are too smart to build a narrow, top-heavy car. They gave the 99 a super-wide track, about 55 inches, wider than every other small car and lots of big cars too. In fact, the track and wheelbase are very close to those of cars like the Ferrari 330/GTC, Bizzarrini GT America, De Tomaso Mangusta and Lotus Elan +2. That's good company, where handling and stability are concerned.

Riding this wide track are big wheels, 15-inch ones that roll high over bumps and dips. Some builders try to save interior space by making the wheels small. SAAB just moved them outward, but kept the body slim. In

fact, that was their basic approach to the design of the 99's new one-piece body-frame structure. "We started out thin, and added metal where we needed it. That was part of our overall effort to keep the size small to make a light car, which still was roomy."

Wider than the 96, the 99 is naturally also heavier. But much of its added weight includes extra comfort features and sound deadening. SAAB could afford this because it made more of the body do more work, welding additional outside panels into the main "fuselage." The 99's body has about the same stiffness as that of the 96, which was already famous as one of the world's strongest cars.

The 99 is small where it should be small. Consistent with good looks, the front end was made relatively low and narrow, "no longer than that required to obtain convenient locations for headlights and air intakes," one factory man said. There are safety reasons for this. It considers the safety of the pedestrian, who's less likely to be scooped up by a SAAB. It considers selfish safety too, since a rounded, tapered nose is less likely to lock horns with another car.

A wind tunnel also told SAAB's designers to round off the corners of the 99's nose. It forces a path more easily through the air that way. There's an additional practical benefit, one you appreciate every day you drive. It re-



duces the car's actual turning circle, the one that counts, measured wall to wall.

Except that it's so easy to handle, you don't realize the 99 is small outside when you're inside. It has the generous greenhouse glass of a big car, with the difference that there's not a lot of sheet metal to look across. And there's interior room to spare. It really is the full five-seater it was planned to be.

The buckets up front are designed for two, so three have to be accommodated across the back. The 99 has the hip room and shoulder room, plus a full five feet across at elbow level, where you need it most. But in most cars, even if they're wide enough, the guy in the middle suffers. He's sitting on thin padding over a differential with his feet on a drive shaft tunnel. With front-wheel drive, the 99 gives him full cushioning and a flat floor.

Those are just a few of the tricks the engineers used to make you forget you're driving a small car—except for the convenience—when you're sitting in a SAAB.

"Driving a SAAB is like adding an extra lane to every road."

Can we be comfortable in a SAAB?



Grilles and scoops on many cars are there for looks alone. On a SAAB they're engineered to keep fresh air flowing.

SAAB engineers had only one new car to worry about. They aren't making twenty-seven different versions of supercars, musclecars, ponycars, compacts, full-sized cars, personal cars and prestige cars. They concentrated all their attention on one new model, making the 99 the best car they could.

It shows in the amazing way the seats of the 99 can be adapted to your shape and driving style. You don't have to pay extra for a six-way power seat. The front bucket seats of the 99 have built-in adjustments that surpass anything other cars can offer. If you can't get comfortable in a 99, it may not be the car's fault!

Seats on most cars slide back and forth. SAAB 99 has a range of 6.3 inches. Down in front of the seat there's another lever to change the height and angle of the seat. You can raise the front by $\frac{3}{4}$ inch, the back 1 inch—each time changing the seat angle—or raise both at the same time. Drivers of any shape and size are guaranteed a fine view forward over the steering wheel.

Some cars have seats with adjustable back angles. Few are as sophisticated as the 99. There are two adjustment ranges. One is for normal driving, with angles from 12 degrees—almost upright—to 40 degrees, if you want to feel like a Grand Prix driver.

For resting on the road, you move a safety catch that lets the back swing down to 45 to

68 degrees from the vertical. Does it fold all the way down to make a bed? Not quite, especially with the headrests. The Swedes feel there is a correct time and place for everything.

If you do enjoy camping out, the 99 has another feature you'll like. It's a simple trick, one I think all cars should offer: a rear seat back that folds down flat to make a straight-through carrying space, almost six feet long, from the rear bumper to the front seat back. The normal SAAB 99 trunk has over 12 cubic feet of capacity, arranged in a sensible shape so it can be used. That's more than most U.S. sporty cars. With the seat folded down, there isn't much you'd have to leave at home.

Why don't more cars have this semi-station-wagon feature? I found out on a recent trip to Detroit: It costs money. It's not just the cost of the hinges and latches of the rear seat, which have to be extra-strong so any luggage in the trunk will be kept there in a crash. In most cars the panel behind the rear seat is used as a major part of the body structure. Leaving it out means that metal has to be added elsewhere to take the load, in ways that add to the cost. That's the more expensive route SAAB chose to ensure your comfort in a 99.

The 99 is like a piece of fine Swedish furniture: styled for looks and for comfort too. Its roof line looks fine, without being a fastback or tunnelback. Headroom is 39 inches in front



and 38 in the back. That's an inch more in each seat than a Rolls-Royce! And there's no central drive shaft tunnel as there is in a Rolls.

If you like the feeling of driving an armored car, peering out through narrow slits, avoid the 99. It's low-waisted with deep windows and narrow pillars, giving a light, airy and pleasant feeling with 25 square feet of glass.

You can't be comfortable if you're cold. Some cars built in sunny climates aren't too strong in the heating department. Not so SAAB of Sweden, where it's cold even when that midnight sun is shining. Heating system tests are routinely carried out in frigid Lapland. At its Trollhättan factory, SAAB has a cold-test room, as do most other makers. But this one is equipped with light-load rollers for the front wheels so the car can be "driven" away from a cold start to see how long it takes the heater to begin doing its job.

Developed to high efficiency, the cooling system contains only a little more than two gallons of water. This reduces the amount of anti-freeze needed, and helps the system warm up quickly. The same benefit is provided by the radiator fan, which is driven by an electric motor and isn't switched on until the temperature gets high enough to require it.

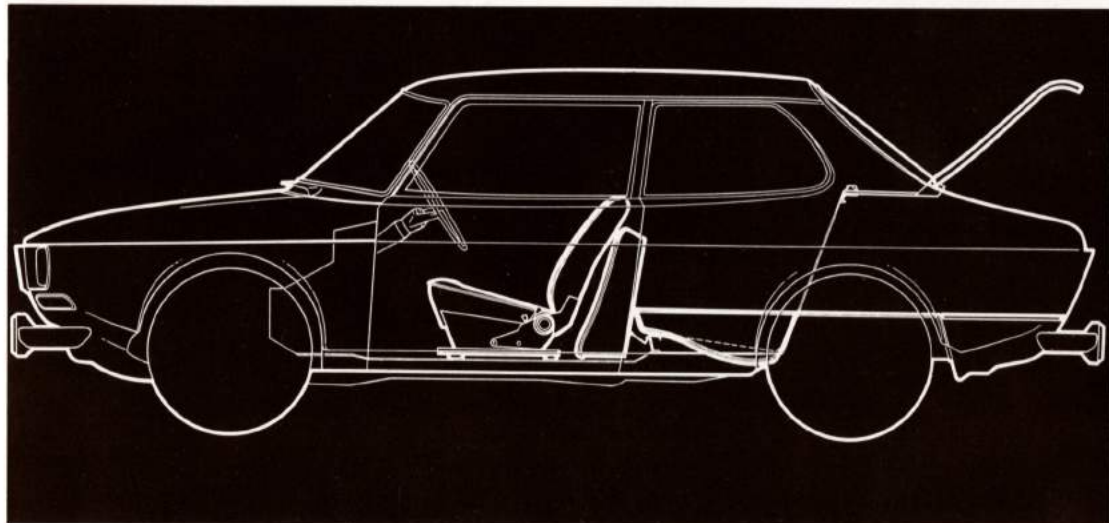
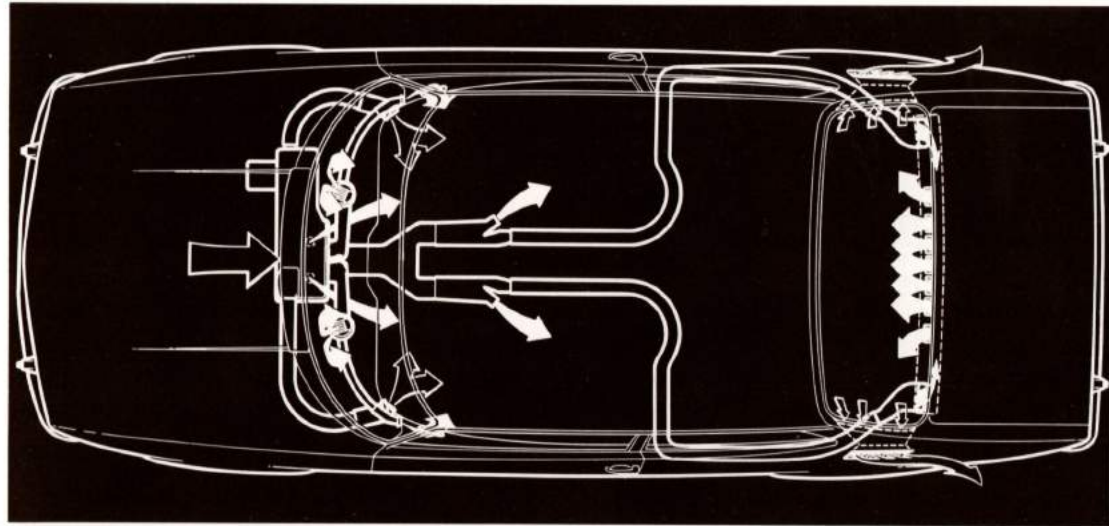
The heater's thermostatically-controlled output is piped from one end of the 99's interior to the other, wherever it's needed, by a system of ducts. Rear window defrosting, more

heat for the back seat, defrosting for the side windows—they're all available by operating simple controls on the dash and console. This little warm-air furnace in each 99 is powerful enough to let you drive in shirtsleeves in temperatures of 40°F. below zero.

Vents in the rear quarters, shaped and sized with wind tunnel tests, constantly evacuate the interior to let fresh air in. Cool air can be drawn through the heater ducting and is also delivered through two dash outlets, adjustable for volume and direction.

A powerful two-speed blower pumps air into the 99, either winter or summer. But SAAB engineers know that the two seasons pose different requirements. In the summer, you want as much air as you can get. SAAB expects you to use the blower for cool air, especially at low speeds. In the winter, though, the air should move more slowly through the core of the heater so it will pick up more heat, delivering more to the interior.

What do most car makers do, faced with this design conflict? They compromise. But not SAAB. On the heater motor, under the hood, there are two different connections, easily selected. The "winter" one is right for maximum heat transfer. In the "summer" position, the blower delivers one third more air, to keep you cooler. A small thing—typical of the attention to detail that makes a 99 so satisfying to own.





*Leave the brake on? Forget to push in the choke?
Low on brake fluid or oil pressure?
Warning lights on the 99 keep you safe
before you start driving.*

Why doesn't the new SAAB look ugly like other foreign cars?

The 99 might not have been so nice looking. SAAB, as you may know, also makes airplanes, some of the best in their class in the world. That means they're completely clued in to the vital importance of good aerodynamics for best performance. They found out with their first car design, the 92, how a reduction in air drag can boost both economy and acceleration at highway passing speeds. The new car had to be low in drag too.

Luckily, SAAB didn't let the aerodynamicists shape the car. Experts in air flow have designed some of the world's ugliest automobiles. Instead the styling of the 99 was assigned to an experienced stylist. After he was finished, the doors were opened and the air flow experts were let in.

Sixten Sason was a well-known man in Sweden thanks to his imaginative sketches in periodicals of a handsome and exciting world of the future. When aircraft-builder SAAB started thinking about building a car after the last war, Sason was called in. He created a smooth teardrop shape that satisfied the drag-conscious engineers and served as the basis for all SAABs through the 96.

The engineers at Trollhättan credit Sason, himself an engineer as well as an artist, with many design inspirations during the genesis of the 99. Work on the new car began early in the Sixties. As early as 1962 the engineers grafted deep wheel houses onto a stock SAAB

to try out the effects of the radically wider track. But something a little prettier than that was clearly needed.

Sason first made a series of sketches to explore some possible directions. Then, to expose them to SAAB management, he had five tenth-scale plaster models made, painted and trimmed just like a full-size car. Two of them tried out an asymmetric style, with the air inlet offset to one side. Another had an Alfa-like aspect. One was quite close to the final design, except that it had single round headlamps instead of dual units or the rectangular ones used in Europe.

With agreement on that shape, the next stage was the refinement of a full-size clay model of the 99-to-be. From it molds were taken to allow a fiberglass styling model to be made, one that could be fitted inside and out like the actual car. Management passed approval on the 99's final style in April, 1964.

At this point the styling was complete, but not the shaping of the 99. Now the aerodynamicists had their chance. They could change the outline if they needed to, with the approval of the stylists. To get the right information, they first had to make a model of the proposed car. Done to one-fifth scale, the model was fully detailed, with all radiator ducting and interior venting. It had to be, or it would have been worthless. Each of the several models made cost \$10,000!

They were taken to the wind tunnel of the Technical University of Stockholm for a long series of tests. Many detail changes in the shapes were made to reduce the drag and make the car stable—for both are important, and frequently conflict with each other. The windshield was more deeply curved, the front end was rounded more, and the front corners were pulled in slightly.

SAAB had hoped to give the new car a drag coefficient as low as that of the 96. They didn't quite make it, which is no disgrace, since the 96 is one of the slipperiest sedans in the world with a coefficient of 0.35, which means it has only 35% as much drag as a flat plate of the same area. Most sedans are in the range of 0.40 to 0.50, as are many sports cars too. At 0.37, the new 99 has nothing to be ashamed of.

Stability, extremely important in a small car, turned out well too. Tests were run at wind angles of up to 40 degrees to find out whether they'd affect the 99. There was little or no disturbance, accounting for the car's immunity to the effects of side winds. Other changes in the tunnel included the placement of the interior air outlet vents, and the revision of the sides of the car to keep road dirt from building up on the window glass.

It may surprise you to learn that not all manufacturers shape a new model with such loving care. Some make so many different



kinds of cars that they haven't time. Others are reluctant to blend style and aerodynamics. Still others lack the talent and know-how to do this work. SAAB works on one model at a time, is willing to try new things, and possesses all the skills required.

A good shape avails little if it's poorly finished. SAAB's standards of paintwork appearance would do credit to the makers of a much more costly car. I overheard this conversation in the paint shop:

"They say in some factories the inspector isn't supposed to get closer to the car than eight feet away, that whatever he can't see from there should be accepted. But ours don't do it that way."

"That's right. The other day we repaired a fault under the nose of a 99. You couldn't possibly have seen it unless you were about to be run over."

That's one more reason why the new SAABs look so good.

"It may surprise you to learn that not all manufacturers shape a new model with such loving care."

Will my family be safe in a SAAB?



The SAAB 99 may be one of the most comfortable small cars in the world in which to have a head-on collision. You weren't planning on having one? The 99 may also offer you the best possible chance of avoiding an accident before it happens.

Most manufacturers today claim they invented auto safety before the first glint appeared in Ralph Nader's eye. In SAAB's case, this happens to be true. Before there were any Federal requirements, the cars from Trollhättan had complete harnesses, fail-safe braking systems, and structural strength that exceeds present standards. But SAAB, like other makers abroad, also believes in safety through crash prevention.

Stopping has a lot to do with avoiding an accident, and it's a strong point of the 99. With four-wheel disc brakes, big ones like those used on racing cars, the 99 has as much braking power as its tires can transmit to the road. Four fifths of the braking force is applied by the front wheels, so the rear wheels won't lock up on a sudden stop. This means the 99 will always stop straight, without dangerous tail-sliding that could take you into another lane.

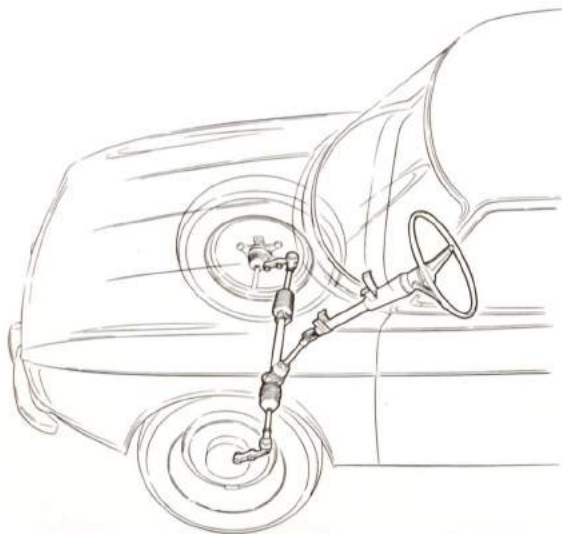
Since it's attached to the front brakes, instead of the rear ones as in most cars, the mechanical hand brake is an effective extra means for slowing down the 99. Working through miniature drum brakes inside the

hubs of the discs, the hand brake also helps a lot on slippery surfaces, acting as a limited-slip differential to pull out of slick spots when it's gently applied.

SAAB's 99 declared war on brake failure. A vacuum power booster is standard equipment, to help keep pedal pressure moderate. But the amount of help provided was deliberately held down, lower than it could have been, so you wouldn't be startled by a sudden "hardening" of the pedal if the booster should fail. The hydraulic brake lines, zinc-coated for corrosion resistance, are routed to the rear wheels *inside* the body, along the left-hand sill. They're well protected from salt and stone attacks.

Most cars have only one brake line going to the rear; SAAB has two. This costs more, but it makes possible the car's unique diagonal fail-safe stopping system. If a failure occurs at one wheel, the one diagonally opposite is also affected. With this unique arrangement, there's always braking power at both ends and both sides of the chassis. This helps both the 96 and 99 stop straight if there's been a failure, especially on slippery roads.

Of course SAABs have a steering column that's designed so it won't intrude deeply into the cockpit in a crash. On the 99 it's helped by a pair of universal joints placed so the column will tend to "fold." They use a special kind of column, though, one that's designed so it can



be tried out before it's installed so they can be certain it will collapse correctly. Every single column installed in a SAAB car is checked in this way.

With its 15-inch wheels, the 99 comes equipped, at no extra cost, with tires which are safe throughout its whole range of possible speeds and loads. The wheels are outstanding too. An outside wheel maker, one of the biggest, tested some SAAB wheels and offered some advice based on the tests. The conversation went something like this:

"You know, your wheels stand up unusually well. Their resistance to fatigue failure is very high. We might be able to suggest some places where you could lighten them and save some money..."

"Yes, we know. But we'd rather not change them."

Should you have an accident, you'll be well off in a SAAB. The company built a barrier for testing as soon as there were standards for one, and as long ago as 1966 they crashed their first 99 prototype to find out how strong it was. They've also conducted rear-end collision tests and an inverted-car drop test that's brutal.

In the drop test, a perfectly good SAAB is suspended, roof down, two meters or almost 80 inches above a concrete floor. Then it's dropped. Down it plummets, reaching a speed of 14 miles per hour, crashing heavily on its



roof. SAAB engineers speak with awe of the results: "Some cars are absolutely *flat* afterward!" The dropped 99 has a flattened roof line, but the passenger compartment remains completely intact.

SAAB uses a trick to survive this test. The trick is a windshield pillar that's one of the strongest known. Inside the pillar is a shaped, thick-walled tube that extends down, inside the body, to the front wheel houses. The end of each tube fits in a cup in a heavy load-spreading plate that's spot-welded, at ten points, to the wheel house. It's capable of absorbing terrific impact, from the front quarters as well as vertically.

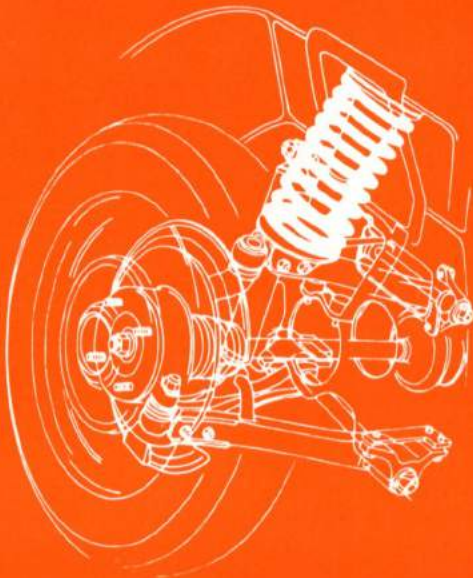
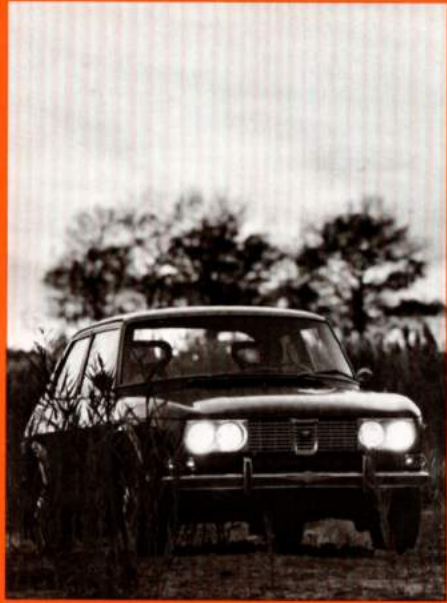
Other invisible safety factors are built into the 99 body. Its sills, below the doors, are unusually strong. Beneath the front seat there's a heavy crossmember that helps prevent intrusion from the sides. At the rear, the fuel tank is placed beneath the floor of the trunk, where its contents can be kept well outside the car. Safety, it seems, is just another feature of the SAAB, supplied as standard equipment.

Quite a letdown. The 99's rafters are bent but not broken by a carefully instrumented drop test that simulates an impact on the roof that's far more violent than a rollover, for example, could produce.



"You don't inspect quality into the car," a SAAB man told me, "you build it into the car."





Doesn't a small car like the SAAB feel "funny" on the road?

Some designers think driving a car should be work. They favor cramped seats, lots of noise, odd weight distribution and kinky suspensions to give the driver plenty to do. The Swedes, with one of the highest standards of living in the world, have outgrown this nonsense. They feel a car should follow its own nose, at least part of the time, without constant correction from the pilot. That's why American cars are very popular in Sweden.

In many ways the 99 has the substantial feel of a bigger car than it actually is. We've already seen how good aerodynamics contribute to its stability. Weight distribution helps too. The 99 has 61 percent of its weight on the front wheels, which is to say that the arrow is weighted in the right place. American cars are balanced the same way.

If you put the weight at one end of the car and try to drive the wheels at the other end, though, you have a bad combination, with poor traction and unpredictable handling. That's why all SAABs, starting with the first one in 1946, have had front-wheel drive. That's also why the Olds Toronado and Cadillac Eldorado, two of America's most capable—and most costly—cars, are driven through the front wheels.

Front-wheel drive is expensive. Some designers have tried to prove it isn't, but failed. It needs four universal joints in the drive line, while a conventional car needs only two. The

joints are all special ones, very costly, the inner ones to allow the drive shafts to change length and the outer ones to transmit the torque smoothly even when the front wheels are turned sharply. Front hubs, suspension, engine mounts all need special attention when the front wheels are driven.

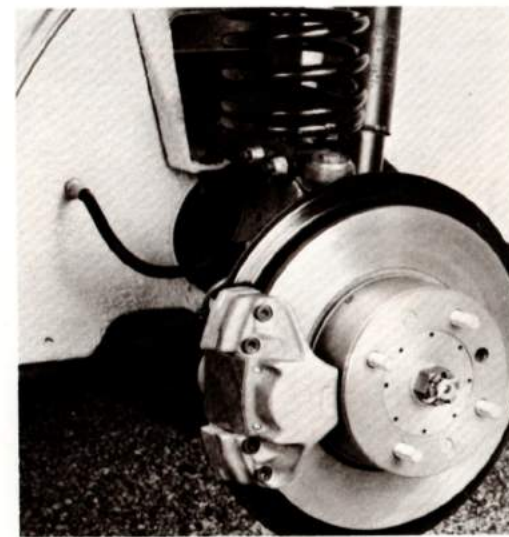
Even though there's no driven rear axle, a front-drive car still needs a rear suspension, and not necessarily a cheaper one. In fact, SAAB has given the 99 a costly and sophisticated rear suspension, one that actually "thinks" to give the car consistent handling whether it's empty or fully loaded.

Here's how it works. The rear wheels are carried on a tubular axle. Linkages at each end cause the axle to twist a little when the car leans in a corner, making it act as a bar resisting the car's rolling, tending also to reduce the power of the tires at the back to grip the road. The linkage geometry is such that the effect of the bar is reduced as the rear of the car is pressed down by added cargo, restoring cornering grip as needed to cope with the additional load.

This suspension is very clever. It endows the 99 with handling that's almost exactly the same whether the car's lightly or heavily laden. Such solutions aren't arrived at by chance. They're the work of engineers like Rolf Mellde, chief engineer in charge of development for SAAB, and Gunnar Ljungström,

his counterpart in charge of design. Mellde is one of those rare designers in the world auto industry capable of driving his creations right to the limit of their abilities, in rallies and races as well as on the road.

Rolf Mellde does not ignore reality. If he were designing an out-and-out racing car he'd probably give it rear-wheel drive, for best results with super-high power and a skilled driver at the wheel. But he believes that front drive, the more costly solution, is the right one for a family car driven by an average driver over different kinds of roads in varying weather conditions. As long as SAAB can af-



least one production car on the road running up 100,000 kilometers on the clock, 62,000 miles. These long-distance cars are driven in two shifts, around the clock.

When the last zeros click into place, these cars will be totally disassembled, their parts scattered in an orderly style, each one measured and evaluated. Data gathered this way will be used to improve both materials and methods. But this is more than a dry technical exercise. All the car's repair, maintenance and fuel costs will be tallied using the same yardsticks an owner would. SAAB engineers get a direct reading on whether or not their cars are actually delivering Total Economy.

One other final check on production quality is made. As in most factories, each SAAB is "driven" on a set of rollers indoors, at the end of the assembly line, to see if everything works right. The roller test is useful, quick and convenient, and SAAB is satisfied with the results it gives. But to be sure that the testers don't lose touch with reality, they're instructed to take every tenth car for a run on a five-mile road course near the plant. That gives them a frequent refresher on how the roller results relate to behavior on the road.

In design, as well as materials and production, money was spent on the SAAB to save you money. All SAAB cars, for example, are equipped with free-wheeling, a feature that used to be a costly extra on American cars.

Free-wheeling is a lot like an automatic clutch, one that releases the drive to the wheels whenever the engine speed drops. When you step down on the throttle, it engages again.

A simple and service-free device, free-wheeling offers these advantages:

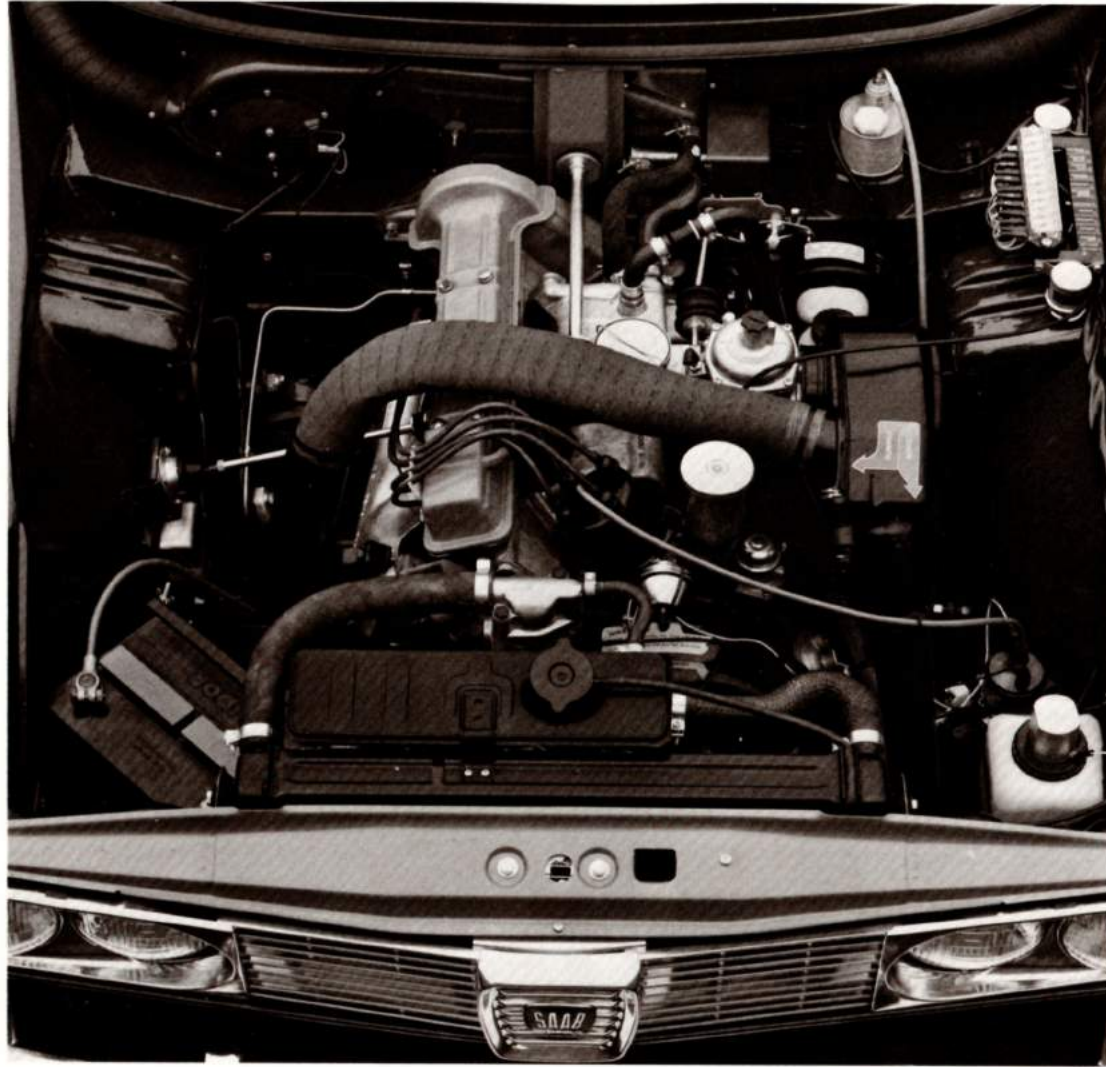
1. Shifting is easier. You can upshift and downshift without using the clutch.
2. Both the clutch and the transmission will last longer, the latter because the free-wheel relieves the transmission gears of stresses from the rotating clutch mass.
3. Because the free-wheel provides automatic "coasting," it extends fuel mileage from 5 to 8 percent.
4. Many safety experts say the safest thing to do when a car begins to skid is to de-clutch, to separate the engine from the drive. The free-wheel does this automatically.

Some people don't understand the free-wheel. They leave its control handle in the locked-out position and never know it's there. But those who try it find it another aid to Total Economy of driving.

SAAB spent more money than it had to on another design feature, one that saves you money in the long run. When it started to work on the 99's engine, it tested power units used by many other makers. Among the facts that emerged was the durability of engines with

overhead camshafts. Those with overhead cams would always run longer between valve adjustments than engines with pushrods and rockers, as far as 50,000 to 60,000 miles with no attention if they were adjusted correctly to start with.

That's why an overhead camshaft is a prominent feature of the 99 engine. It's not used to reach astronomical speeds or open super-large valves, as it would be in the racing engines on which it's a normal feature. The expensive chain-driven overhead camshaft is there, like so many other parts of this car's equipment, to make the purchase of a SAAB 99 a sound investment, not just a good buy.



*"SAAB designed the 99 for people who
keep track of what their driving costs." 17*

You may gather, and rightly, that SAAB is concerned about corrosion. These tests helped it put into effect some unusual measures on the 99. The spot welds in frames are susceptible to weakening through corrosion, so the body designers bent the metal to make small drainage passages next to any welds where water might otherwise be able to collect.

Surface finish is excellent. After a five-stage phosphating treatment to "roughen" the surface, the body passes through a vat where its primer coat of paint is literally plated on the surface by an electrolytic process. Extra primer is brushed on by hand in spots the automatic bath may not have reached.

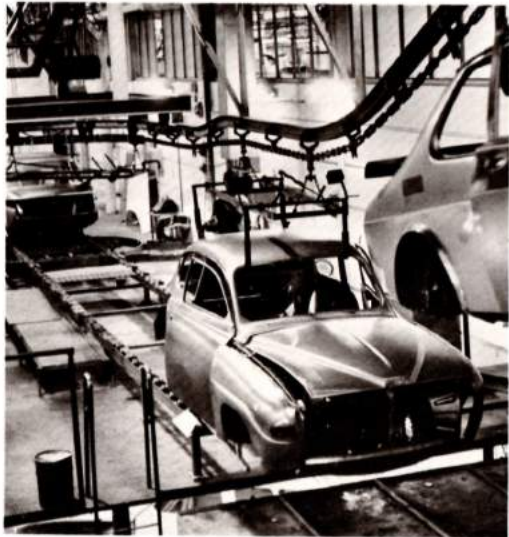
All SAABs are fully undercoated at the factory, an "extra" in most other small cars. The undercoating is applied at a pressure of 3000 pounds per square inch without the use of compressed air, so that it goes on thick and solid with no chance for impurities to be included.

After the body has received its first coat of lacquer, but before it goes into the baking oven, a sheet of asphaltic material is laid into the interior, covering the entire floor. When the body passes through the oven the sheet almost liquefies, seeping into every crevice and forming an $\frac{1}{8}$ -inch protective layer over the entire floor. It adheres so tightly and completely that no water can attack the metal under this coating, which also helps reduce road noise.

Another major part of the 99's development concerned its cold starting ability. Many changes were made before the engineers were satisfied with this feature of the all-new engine. When they started out, the 99 wouldn't start at temperatures below 0°F. This was considered unacceptable. Testing in the cold room, in which the temperature of each cylinder can be measured as the engine starts to fire and run, showed new manifolding was needed to improve the mixture distribution.

Other changes were made. Zenith-Stromberg designed a new carburetor especially for SAAB, with a special tube for the cold-start fuel supply to hold it out away from the manifold walls. Some reduction in performance had to be accepted to get good results, but finally the starting was satisfactory. The 99 will fire up without fail at 30°F. below zero.

After the 99 was introduced, a Swedish newspaper ran its annual cold-starting test for cars in Lapland. The new SAAB was only second-best among the twenty-odd cars tested. "That test wasn't fair," the engineers complained. "It was much too warm!" The thermometer had only been at 9°F. below zero. They were disappointed, but the buyer of a 99 won't be. The engineers did their jobs well.



People tend to assume that Swedish cars are made of "that famous Swedish steel," the kind they're always hearing about in the razor blade ads. Swedish steels are great for razor blades and for other small parts made to take high stresses with high precision. For the wide sheet steel needed to stamp out automobiles, however, SAAB buys most of its supplies abroad, indeed some from the United States.

This highlights Sweden's unusual position as a manufacturing nation. Because it's a prosperous country with excellent access to the world's trade routes, Sweden is able to buy what it needs abroad. This opens up to SAAB a broad spectrum of possibilities. It doesn't have to try to make everything at home; it can go overseas to all the world's auto parts producers and choose the components it feels will combine to make the best car. The electrical equipment, for example, is a blend of GM's Delco, Germany's Bosch, and Sweden's own Electrolux.

The engine of the SAAB 99 is a case history in the value of international industrial cooperation. Until recently, when it began buying its V4 from Ford of Germany, SAAB has always built its own engines. In 1960 it began thinking about the kind of power unit it would use in future models to replace its two-stroke engine range.

To get the best possible advice, SAAB signed a contract with Britain's famed Ricardo Lab-

oratories for the investigation of all feasible engine alternatives. Starting from scratch with four-strokes, it could afford to consider everything. The survey included flat-fours, vee-fours of 90 and 60 degrees, the in-line four, even an overhead-cam three-cylinder engine. It compared air and water cooling, pushrods and overhead-cam valve gear. An exploratory trip to Germany was made to evaluate the Wankel rotary engine.

In 1963, SAAB and Ricardo built two dozen experimental engines of different types for trials. For this project, SAAB set up a special 400-hour engine test program that has since been recognized as one of the toughest in the industry. Using computer-controlled dynamometers, it runs the engine through all speed and load ranges and combinations, from idling to full speed and power, up to the equivalent of 94 mph. The entire test is equal to an average speed of 74 mph over 28,000 miles.

SAAB tried its experimental engines on this cycle. It also tried the engines of other manufacturers, and was astonished at the results it obtained, confirmed in each case by testing not one but two engines. "Some went 400 hours with no trouble," I was told, "but some went far less. One engine lasted only 38 hours! We couldn't believe it, so we tested a third one, finally five in all to be sure it was really that bad."

All the results pointed toward a water-

Aren't there other SAABs besides the 99?

SAAB is so proud of its new 99 and the way it was developed that justice hasn't been done to the other products in its line. Yet some of them deserve mention. For example, you can't overlook the SAAB 37 Viggen, a multi-purpose combat aircraft capable, like its predecessor, the 35 Draken, of speeds in the Mach 2 range. There's also the twin-jet SAAB 105 training and light attack craft, which can be equipped with SAAB-built guided missiles controlled by a digital computer designed and made by DATASAAB.

Quite a company, this SAAB of Sweden. It's become even bigger with its reorganization as SAAB-SCANIA, the result of a merger with famed truck maker Scania-Vabis. Now the SAAB vehicle family includes a complete range of heavy-duty diesel trucks from a 160 horsepower six to a supercharged V8 rated at 350 horsepower. Together, as a SAAB-SCANIA official pointed out, these two firms will continue to show "that it is by no means necessary to be the 'biggest in the world' to create products of a remarkably high technical level."

All this know-how continues to benefit the SAAB 96 sedan and the 95 station wagon, two of the world's most highly-refined and thoroughly-developed cars. The sedan remains a model of aerodynamic perfection, a goal for other makers—and SAAB itself—to try to reach. Compact and tough, the 96 is a professional tool in the hands of rally drivers who

respect its precise and predictable handling, its rugged V4 engine.

Unlike most wagons, the SAAB 95 keeps the handy feel and easy parkability of the sports sedan from which it's derived. Yet it's a half-ton carrier with a Skinplated steel loading platform almost six feet long. With its flip-up seat at the rear the 95 can seat five adults and two children. For another extreme in seating capacity, SAAB offers the Sonett sports car, built for intimate travel for two. With a rakish profile and tailored interior the Sonett is the car that was created to answer the question: "Why doesn't SAAB build a sports car?" Now they do, and like every other SAAB, it's a good one.



A slotted roof keeps dirt from collecting on the 95's rear window.



One of the few front-wheel-driven sports cars: SAAB's Sonett.



Like all SAABs, the 37 Viggen is exceptionally maneuverable for its size and speed.

Front Cover: SAAB 99

Back Cover: SAAB 96

special photography/ Irving Dolin

art direction/ Karen Spencer

production/ Mobility Systems Co.

