

WHAT'S BEHIND...



Read about

Bofors, the giant 300-year-old weapons manufacturer serving the transportation industry.

Volvo-Köpingverken, expert gear-cutters and builders of the Volvo transmissions. 11

Olofström, the two-century-old forge which presses highest quality sheet steel into Volvo body stampings. 15

Volvo-Penta of Skövde, producers of the Volvo power unit and one of the oldest-established engine builders in Europe. 20

Volvo of Gothenburg, where power lines converge, where all components are assembled, where cars are rust-proofed and given many coats of finish in one of the world's most modern painting plants, and where everything is inspected-thoroughly and repeatedly. 23

All the photographs in this brochure are by Hans Hammarskiöld except the cover, the action shot on page 10 and the picture on page 31.

"WHAT'S BEHIND..."

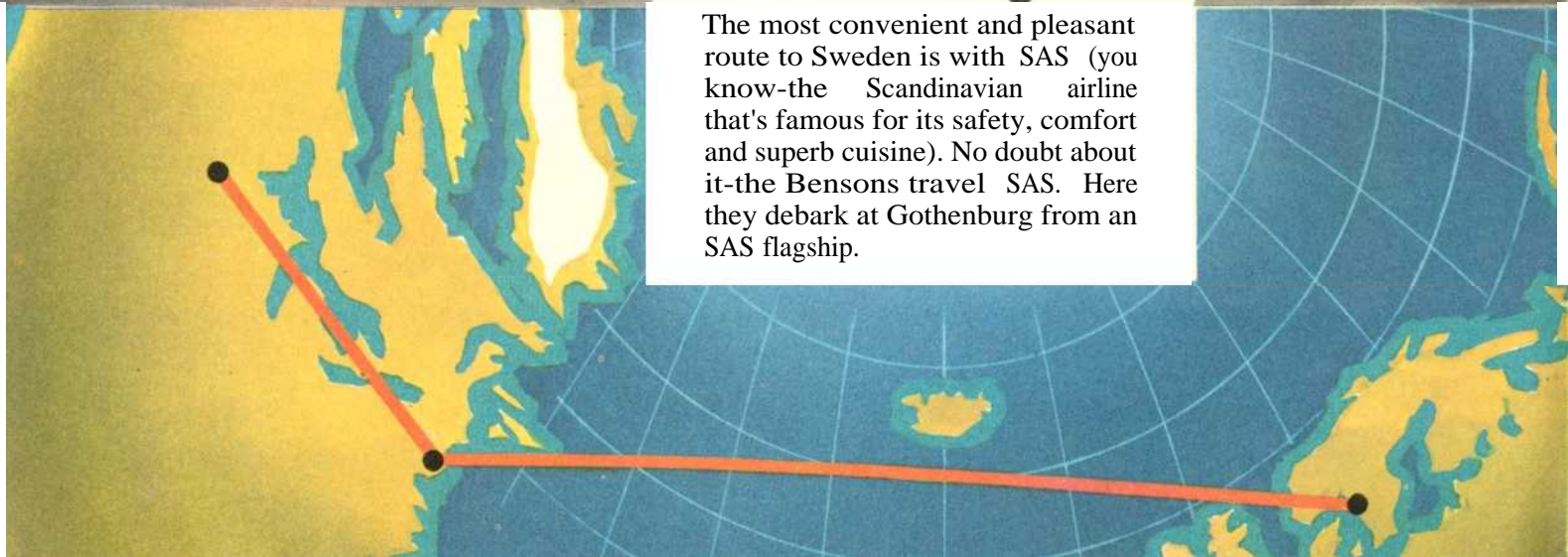


MEET PHILIP AND JANIS BENSON of Minneapolis, Minnesota. They love their Volvo. Every day they get a new thrill out of its wonderful driving characteristics-its roadability, convenience, comfort, pick-up, the way it "parks on a dime," and above all, the honest quality built into every inch. They often wondered, "How can a car be this good?" When Phil Benson, instructor at the University of Minnesota, received a year's fellowship from the American-Scandinavian Foundation to study theater in Sweden, he and Janis thought, "Aha! Sweden-now we can drop in and find out what's behind

VOLVO QUALITY?"



The most convenient and pleasant route to Sweden is with SAS (you know-the Scandinavian airline that's famous for its safety, comfort and superb cuisine). No doubt about it-the Bensons travel SAS. Here they debark at Gothenburg from an SAS flagship.





A first glimpse of the Volvo plant. Those strange-looking "mushrooms" help ventilate the spray booths in the painting department.

Welcome to Volvo of Sweden

Volvo headquarters are located in Gothenburg, Sweden's second largest city, her principal port. It's an ideal spot for the company which is Sweden's largest exporter to the United States. When the Bensons ask to look at the plant, Volvo's President, Gunnar Engellau, suggests that they start their tour by visiting Volvo suppliers. "They lay the foundation for Volvo quality. It's a solid base which we can build upon here at Gothenburg to achieve the results which you and thousands of other Americans have become acquainted with the past few years,"

President Gunnar Engellau bids Mr. and Mrs. Benson "Välkomna" to Volvo.





says Mr. Engellau. "You really ought to begin with the forests, mountains, and rivers up North. That's where we get our raw materials-plus the fuel and power to drive our factories."

The itinerary is set, and Mr. Engellau has loaned the Bensons a Volvo for their tour. They'll travel through central and southern Sweden to see Volvo's four largest sub-assembly suppliers. They'll also see some of the most beautiful scenery in Sweden.



First stop on the Volvo tour is a typically Swedish establishment: an ultra-modern factory with several hundred years of experience.

Bofors, 130 years older than the United States

There are many companies, especially in the machine-building and mining industries, whose histories date back to the misty beginnings of Swedish economic life. Often they began as a small forge or smithy, which grew into a *bruk*. The *bruk*, a typically Swedish institution, was originally a type of country estate on which iron-melting, rather than agriculture, was the chief occupation. From these early manorial establishments, an unbroken process of economic development led to the modern industrial concerns of today. One of the oldest and largest of these is the Bofors Company, founded in 1646 as a village smithy.

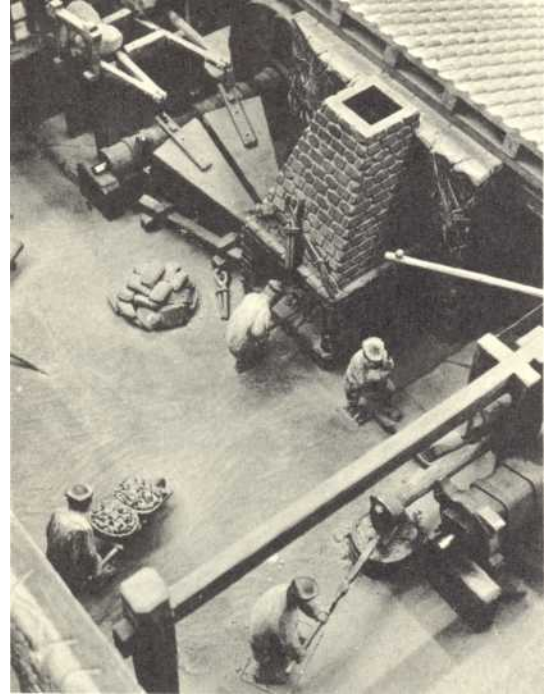
Today Bofors is a world renowned weapons-maker. The Bofors 40-mm. automatic gun, for example, was perhaps the most widely employed piece of artillery in World War II. Volvo now draws upon the vast experience and resources of Bofors for more peaceful ends. Crankshafts, gear blanks, and other Volvo forgings and steel parts which have helped create the Volvo reputation for quality come from Bofors.



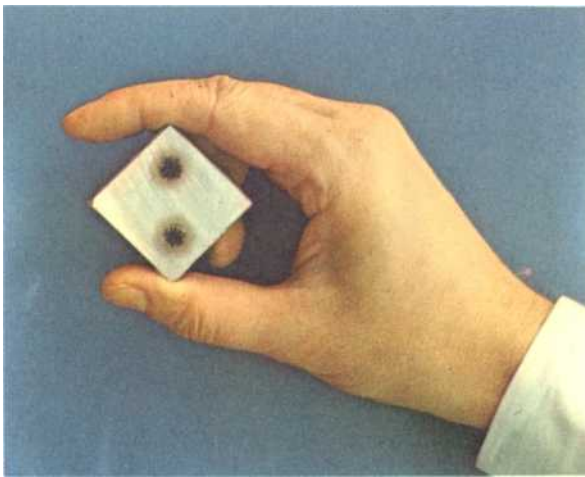
Finishing crankshaft forgings for Volvo in a duplex hammer which develops 290,000 foot-pounds.

Testing Volvo gearshift forks electroinductively in a Magnaflux machine.





Wooden model of the first Bofors forge.



Tapping a test melt in the laboratory-one stage in the constant succession of experiments and tests conducted at Bofors with the object of finding new and better materials for Volvo. (top left)

A piece of steel after spectrographic analysis of its composition.

Bofors makes forgings for Volvo crankshafts, gears, and other parts. These blanks are inspected meticulously for correct form and structure, and given a rough machining before shipment.





Tapping steel from a 35-ton electric arc furnace.



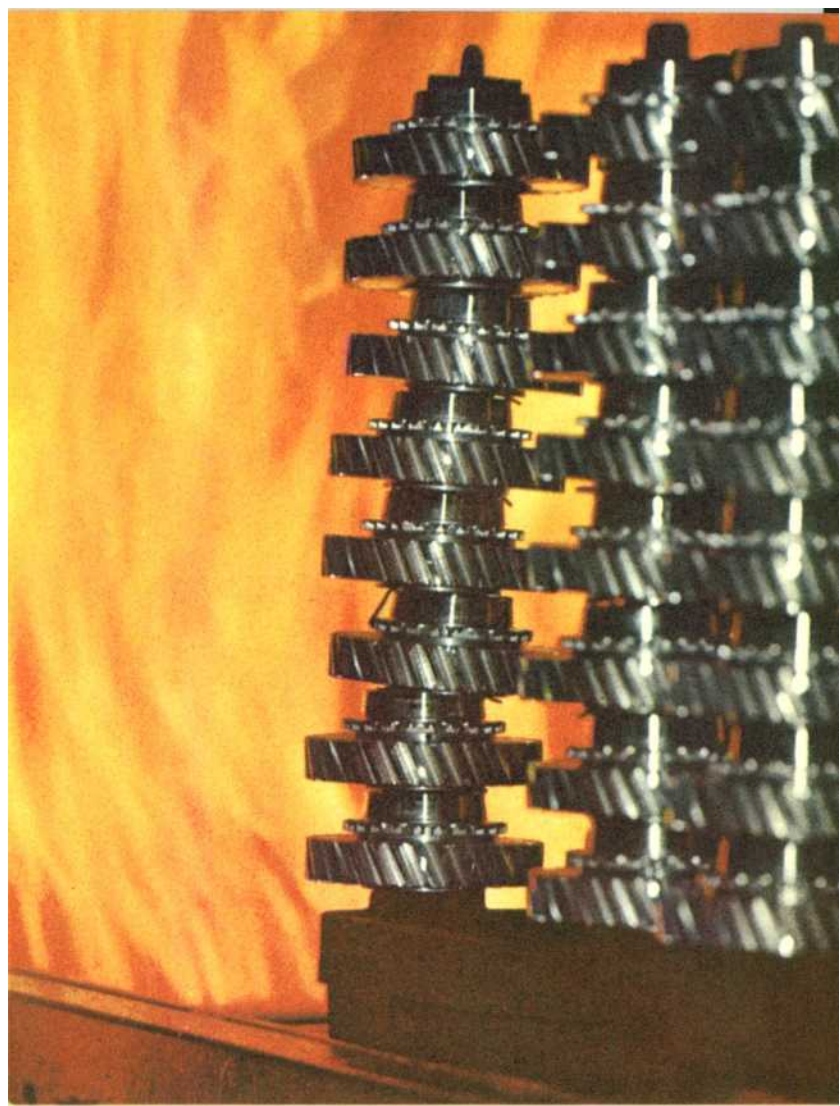
This is what happened to a Volvo in the gruelling Midnight Sun Rally last year. In spite of the rough treatment, Gunnar Andersson drove his Volvo to victory, another proof of Volvo's exceptional strength and durability.

With the sound of the giant Bofors forging hammers still ringing in their ears, the Bensons go on to

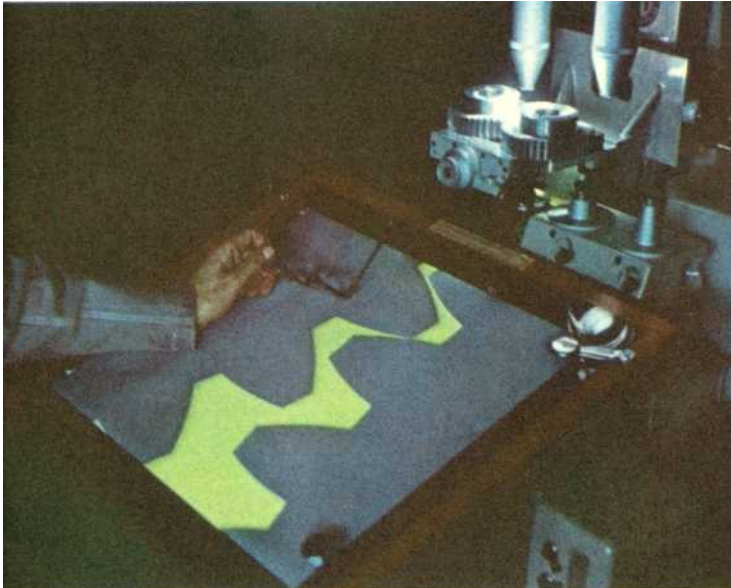
Köping-...perhaps the most exacting manufacturer in Sweden

Volvo-Köpingverken, though considerably younger than Bofors, has nevertheless been making precision parts for more than one hundred years. Before Volvo entered the picture, machine tools were the chief Köping product. It was only a short step to transmissions and differentials, which require the same high precision and strength in about the same places.

Now, all gear parts come to Volvo from Köping, including the four-speed synchromesh transmission

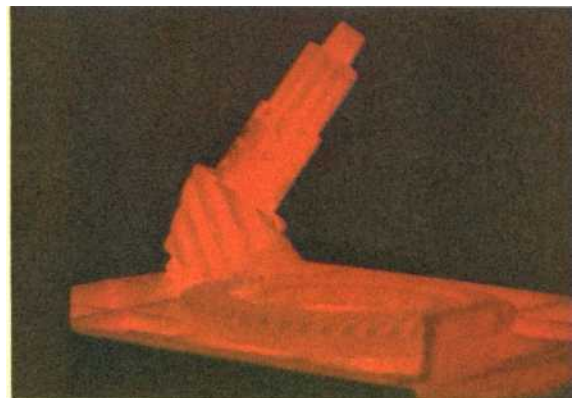


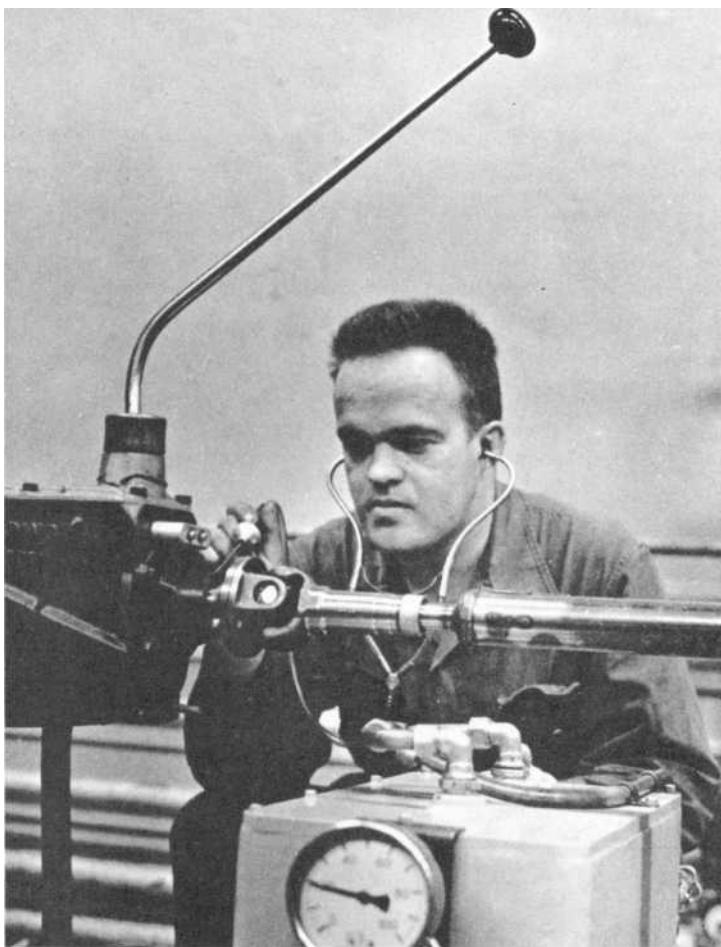
A crucial final operation on gears. A cluster of Volvo first-speed gears on its way into the Swedish-American Lindberg furnace. A protective atmosphere prevents oxidation while the gears harden.



In the inspection room, spot samples undergo several kinds of high-precision checks. The picture shows two gears, enlarged twenty times on a screen to reveal defects in tooth contour and mesh.

Parts for the rear axle assembly coming out of the continuous heat-treating furnace.





which makes Volvo one of the world's easiest cars to drive. A large proportion of the machine tools used in the factory are built by Köping itself.

As has been said, Köping is a precision plant. Everything must fit perfectly if the gears are to perform smoothly, silently, and safely.

The Köping workers are congenial people, and are always ready to take a liberal view of things-except when they find a part which deviates from the prescribed dimensions.

Inspection stations are closely spaced in the Köping plant and a careful tolerance check follows every operation. The well equipped development laboratory carries out a great deal of additional inspection and testing. This laboratory makes electronic, acoustical, and magnetic examinations, brutal fatigue tests, as well as visual inspections with enlargement up to 50,000 times.

Here's a man who's paid to wear out Volvo transmissions. It's monotonous work-and slow, too. He listens with his stethoscope to detect changes in the gear sounds.



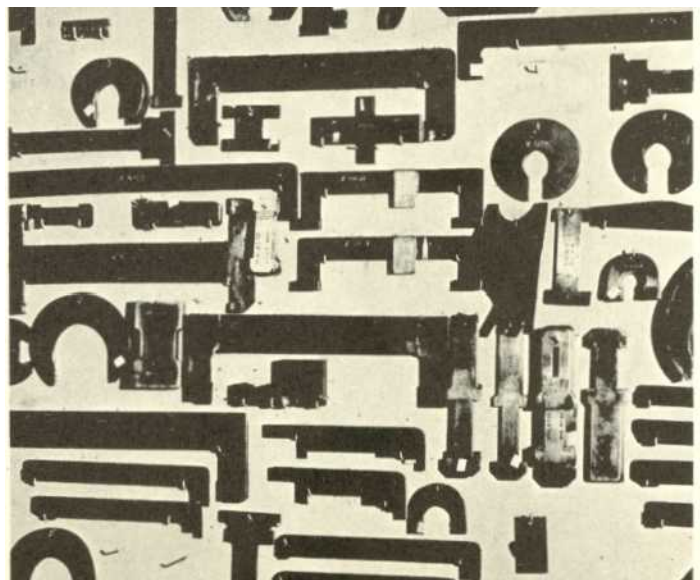
Transmissions are pulled Off the line for loading and deflection tests. Any bending or other changes in the gears under maximum load are revealed by instruments.



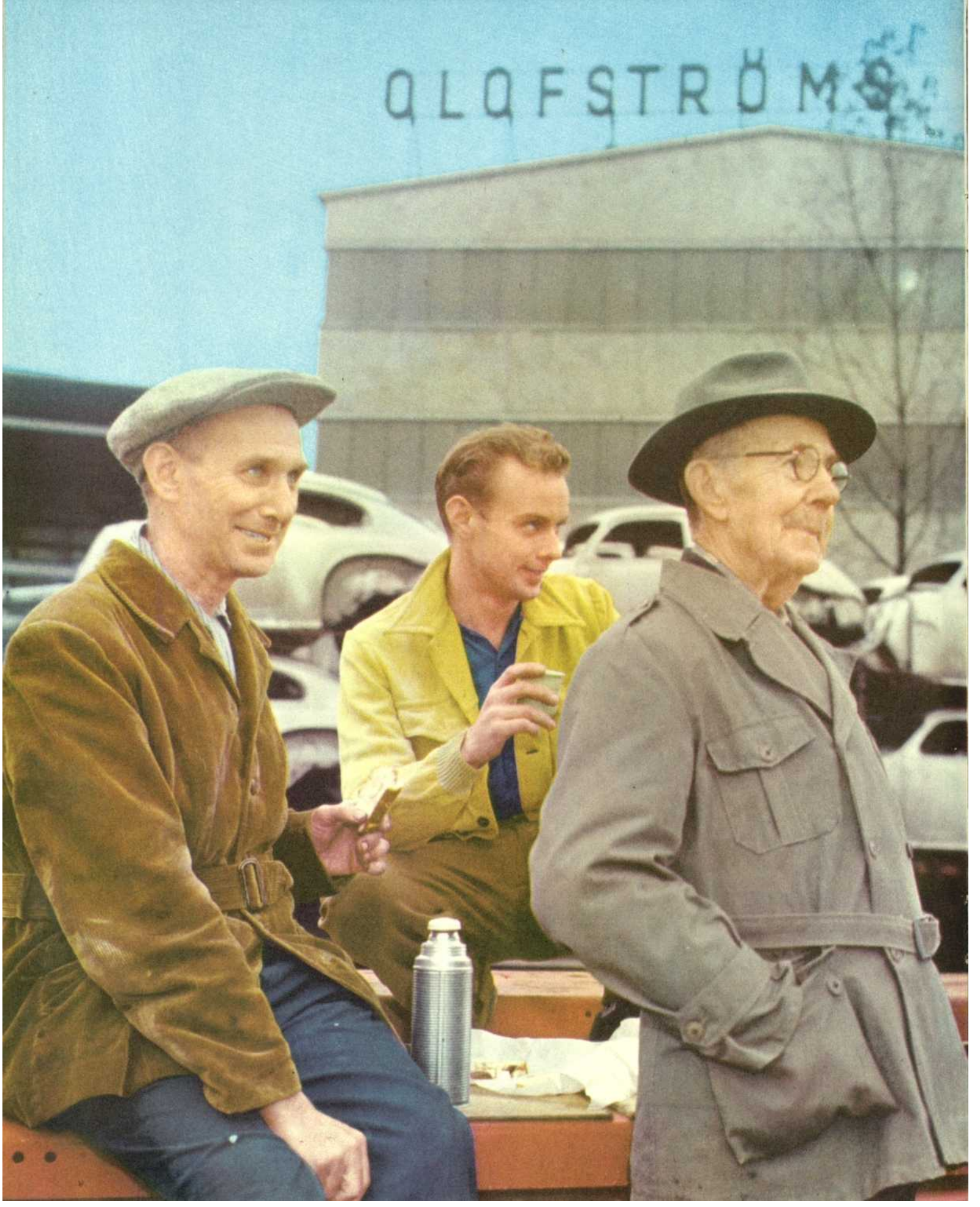


The gauges, too, must be checked with gauge blocks. Here we see a measuring jig for a gear being checked to a guaranteed tolerance of four micro-inches. All the hundreds of thousands of measuring tools and gauges are similarly inspected.

The Köping factory has a huge stockroom containing nothing but inspection instruments. The picture shows a few of them.



QLQFSTRÖM &



One of the great resources of the Volvo Company, and one of the factors which make it possible for Swedish automobile manufacturers to challenge their mighty billion-dollar competitors, is the Swedish tradition of craftsmanship—a tradition which can hardly be matched elsewhere. Bofors, Köping, Olofström, and many other builders of Volvo components have workers, engineers, and office employees whose fathers and grandfathers served the same firm—sometimes even in the same kind of job.

Illustrating this personal tradition of conscientious workmanship, here are three generations of Erikssons—Helge, his father Fredrik, and his grandfather Karl—all sheet-metal workers in the Olofström plant. Karl Eriksson, who is now 86 years old and retired on pension years ago, worked at Olofström for 60 years. Karl's father, too, was a sheet-metal worker at Olofström and was employed there for more than 60 years, and Karl believes that even his grandfather was an Olofström worker.

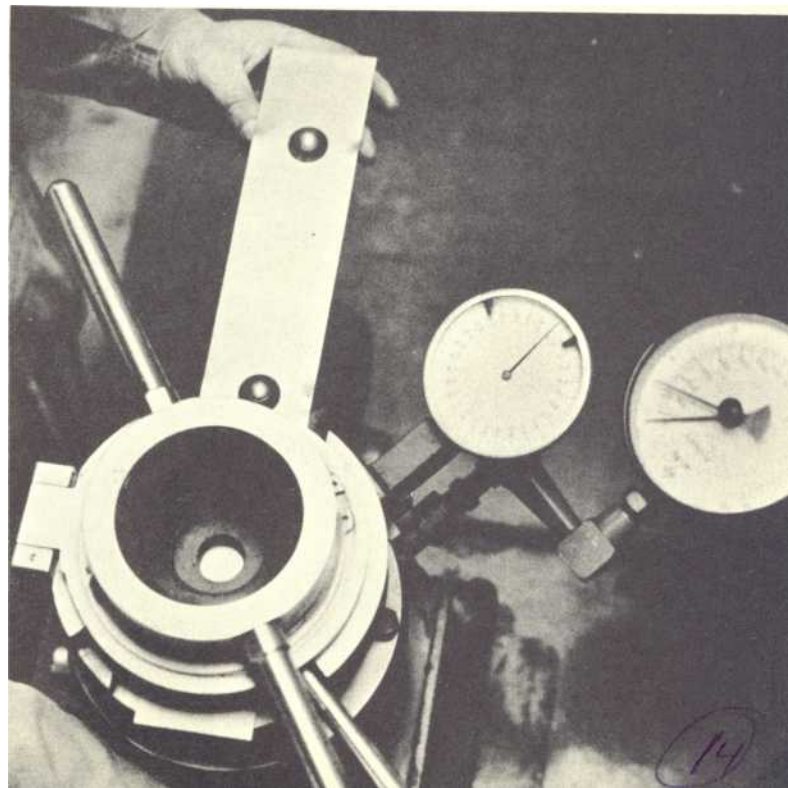
Olofström-200 years on the job

You can argue about what is the most important part of a car, but in an accident there's no question. A strong, well-made body is your best life insurance. To see how Volvo handles this detail, Mr. and Mrs. Benson go on to Olofströms Bruk in Olofström—probably the only community in Sweden bearing the Christian name of a commoner and industrialist. Here they meet still another of those robust veterans who seem more the rule than the exception in the Swedish industry. Olofströms Bruk, founded in the 18th century, soon grew to be the largest plate and sheet-metal works in Scandinavia and one of the largest in Europe. A walk through the vast bays of the Olofström plant is an exciting, almost alarming experience. There are an extraordinary number of things happening at once, and the noise is deafening. Giant presses—among the largest in Europe—cut and shape the roofs, sides, floors, and other Volvo body parts with amazing



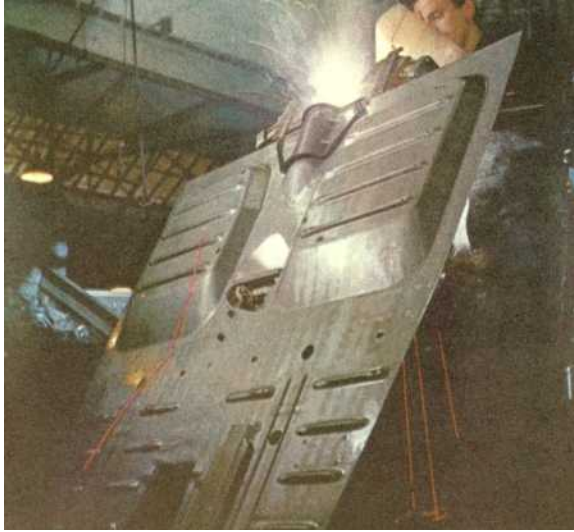
Making the body dies is expensive, hard, slow work requiring great precision. Here we see a side panel die being shaved to size. The red object in the middle is a plastic pattern from which the diemakers work.

Inspection begins even before the work gets under way. Tests are made, both in the laboratory and in the plant. One of them is the Eriksson test, designed to show the workability of the metal. There must be no cracks formed during pressing.









Welding the car floor.

speed. Long trains of loaded trucks rush up and down the aisles. Mechanical hands move bodies and panels in various stages of assembly. And every second minute an all-welded steel body comes off the assembly line to be greased and loaded on to a railroad car for shipment to Volvo in Gothenburg.

The hubcaps are an instance of the pains taken at Volvo to achieve superior quality. The caps are double, with steel inside and brass outside. The brass does not rust, and it provides a more adhesive base for chromium. The brass and steel layers are being joined here.

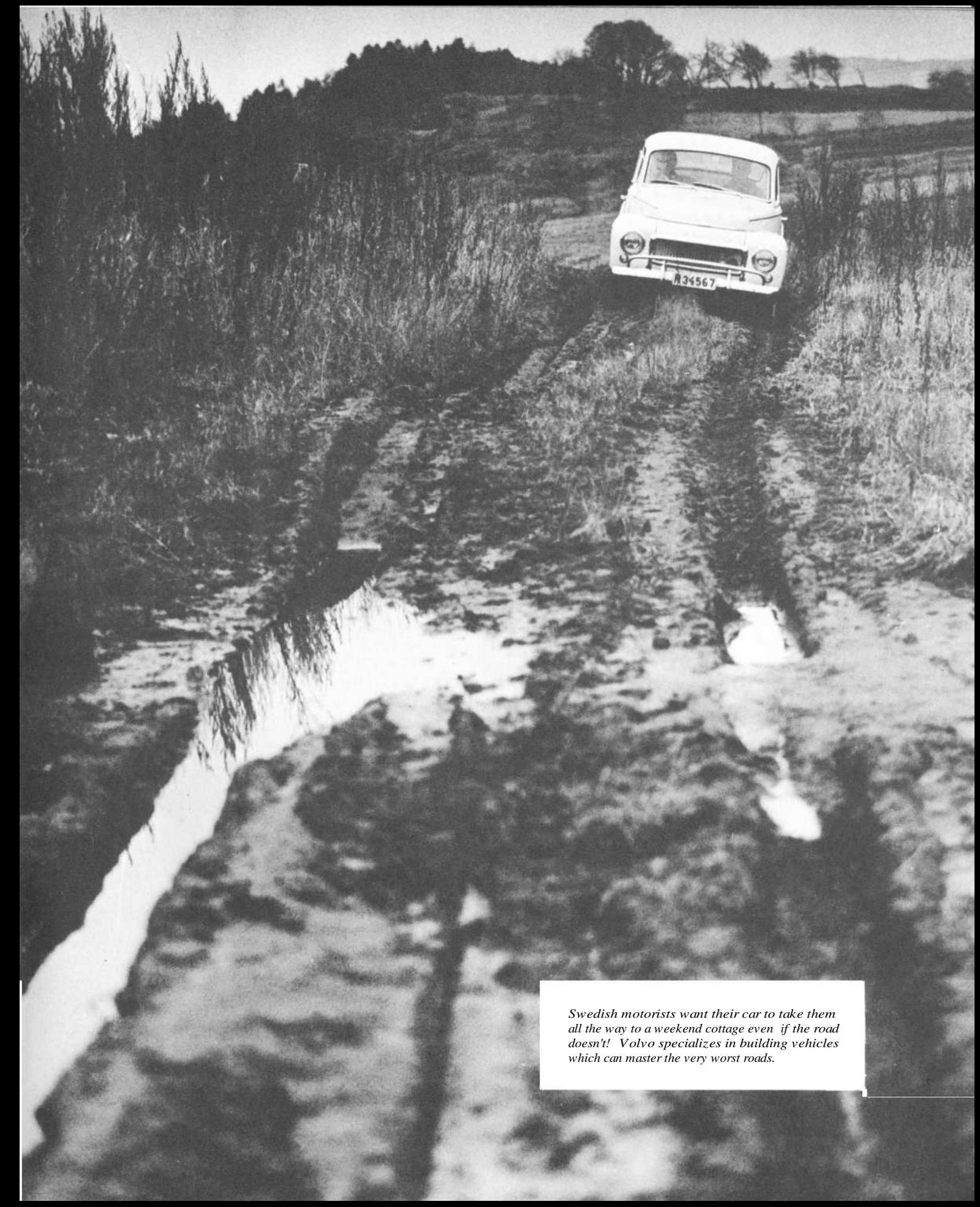


Extreme care is required. Here the window openings are being fixed in order to detect immediately the slightest tendency towards deviation. The readings obtained must be recorded for the guidance of the assemblers at the Volvo factory.



Sheet steel itself is a bulky and inexact material. To assure exact and unvarying dimensions, a wooden prototype is built. All measurements are taken from this model.

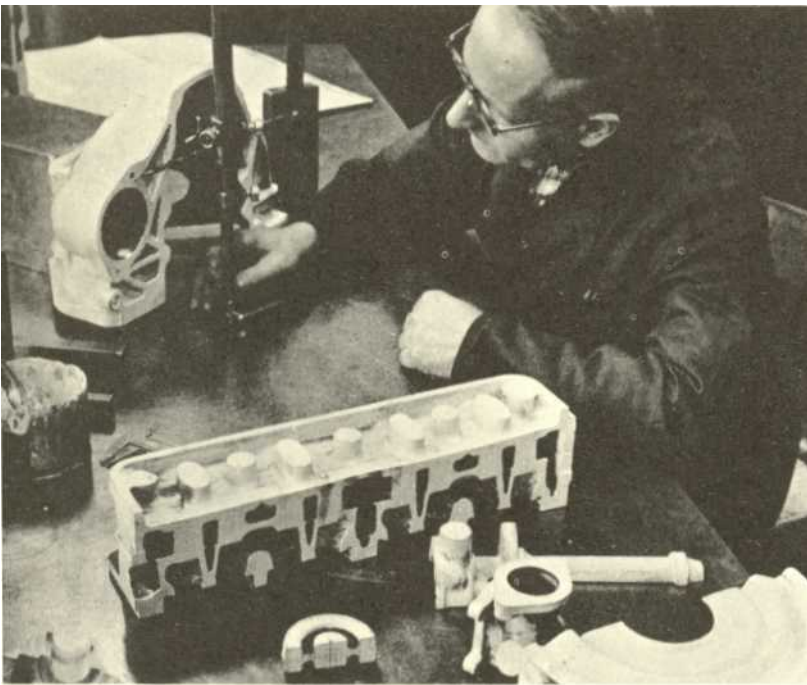




Swedish motorists want their car to take them all the way to a weekend cottage even if the road doesn't! Volvo specializes in building vehicles which can master the very worst roads.



All crankshafts and camshafts must pass Magnaflux inspection, which reveals cracks invisible to the eye, before the parts are fitted into the engine. This safety precaution is typical of Volvo-Penta working methods. All the shaft forgings passed the same inspection at Bofors.



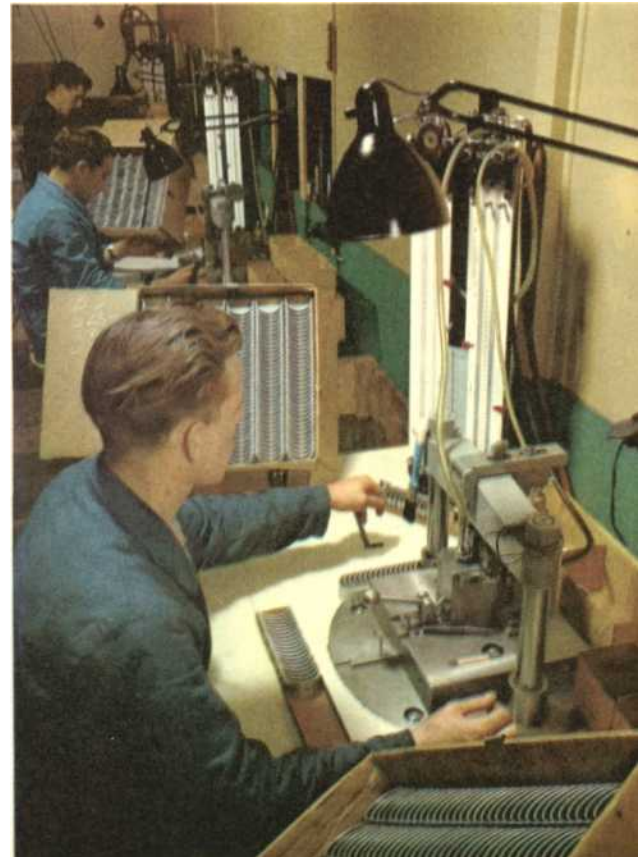
In addition to routine inspections, samples are taken from every lot of parts. Above, an inspection of material and dimensions. Blocks, cylinder heads, gears and other parts are sawed through at all points, and are closely examined and measured.

All the bearing shells are placed in special fixtures where they are subjected to the same pressure as in the engine, and under this condition the dimensions vital to bearing performance are measured.

Volvo is a Latin word.
It means I roll.

But NO VOLVO ROLLS WITHOUT AN ENGINE

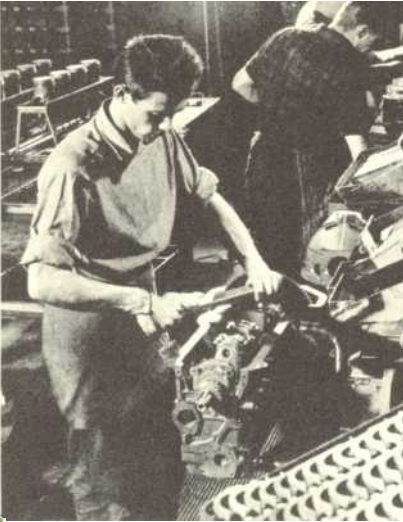
Next stop for the Bensons is the Volvo-Penta factory in the town of Skövde. Volvo-Penta is one of the younger Volvo suppliers. The company was not founded until 1868, but its marine engines had already established an international reputation by the time the Volvo Company began operations. Today, Volvo-



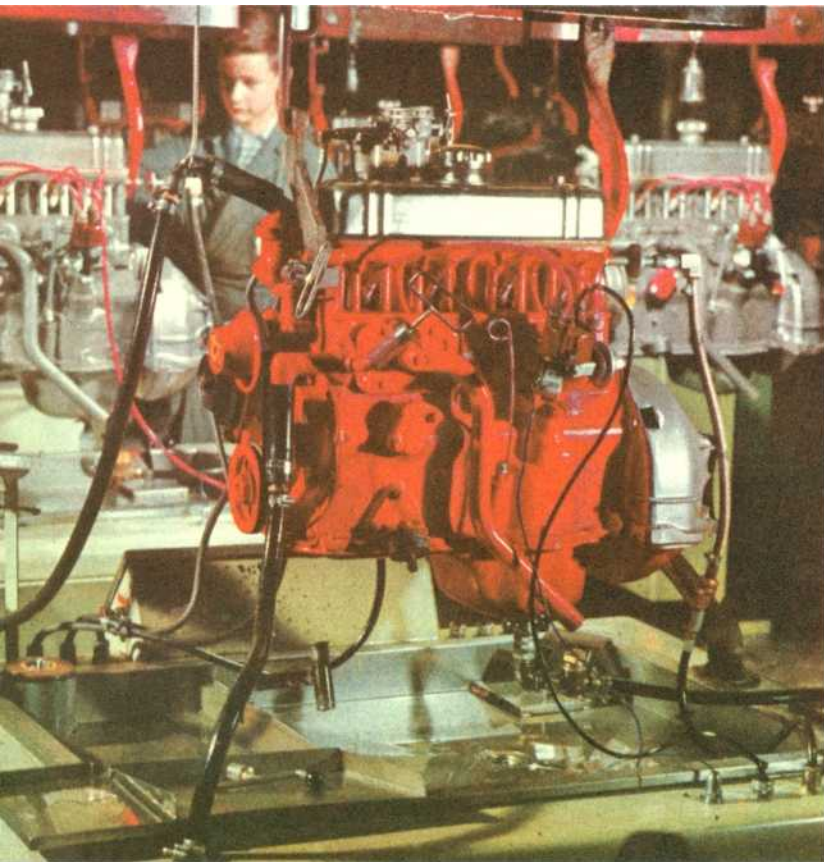


Block castings and cylinder heads on a conveyor. Here, too, precision is the rule. The temperature of the iron is taken before pouring. If it should deviate from the stipulated 2,624° F. by more than 50° F. the ladle goes back to the holding furnace. The iron is alloyed to Volvo's specifications. Nine types of ferrous alloys are used in the Volvo engine.

The inspection points are closely spaced on the assembly line, too. For instance, vital bolts are drawn up with torque-wrenches.



To prepare a steady supply of skilled craftsmen, Volvo-Penta has set up a vocational school having a three-year curriculum and equipped with the latest machines. The pupils start to take part in production during their second year. One of the pupils' assignments is to cut engines into demonstration sectioned units for the use of the Sales Division.



Penta is one of the largest and most modern engine manufacturers in Europe, with high-efficiency equipment and automation wherever quality can benefit. That this factory builds an engine which is a paragon of strength, reliability, and economy is not surprising. The Volvo engine, as built by Penta, is one of the most meticulously designed engines in the world, made of the finest materials, and under constant improvement.

The Volvo-Penta factory is, if anything, even less tolerant on the question of tolerances than the Köping plant. The allowances are minute, and Penta tries continuously to make them even smaller. Inspection is 100 per cent. All supplied parts, as well as all parts made at Volvo-Penta, are inspected, the latter after every operation as a rule. The labor which goes into Volvo engines is treated in the same exacting manner. For every job, there is a carefully prepared report of the qualities required of the man who is to perform it. Volvo-Penta tries to find a man for each job who fits it exactly. The result is extraordinary efficiency paired with high employee morale, since everyone has a job suited to him. Another indication of the careful efficiency engineering at Volvo-Penta is the fact that this plant has the lowest accident rate of all Swedish heavy industry, despite the molten iron and other dangerous materials handled. There are only 1.1 accidents per million working hours!

All engines are thoroughly test-run 18 minutes with gasoline, then inspected and adjusted.

Back to the starting place VOLVO of GOTHENBURG -where it's all put together

Volvo headquarters in Gothenburg was the starting point as well as the finish line for the Bensons' tour, just as it is the first and last step on the way from the Volvo idea to the Volvo car. All the signals are called in Gothenburg. The development laboratory, engineering division, drafting rooms, research division, testing rooms, the executive offices and sales division—all are here. Volvo of Gothenburg is both heart and brain, directing the widespread teamwork behind the Volvo automobile. All parts and sub-assemblies, in a never-ending stream, flow in to Gothenburg from suppliers and subsidiaries in all parts of Sweden.

Cars are picked at random for a run on Volvo's "washboard" which will do things to an automobile that even the worst roads in Sweden couldn't duplicate.

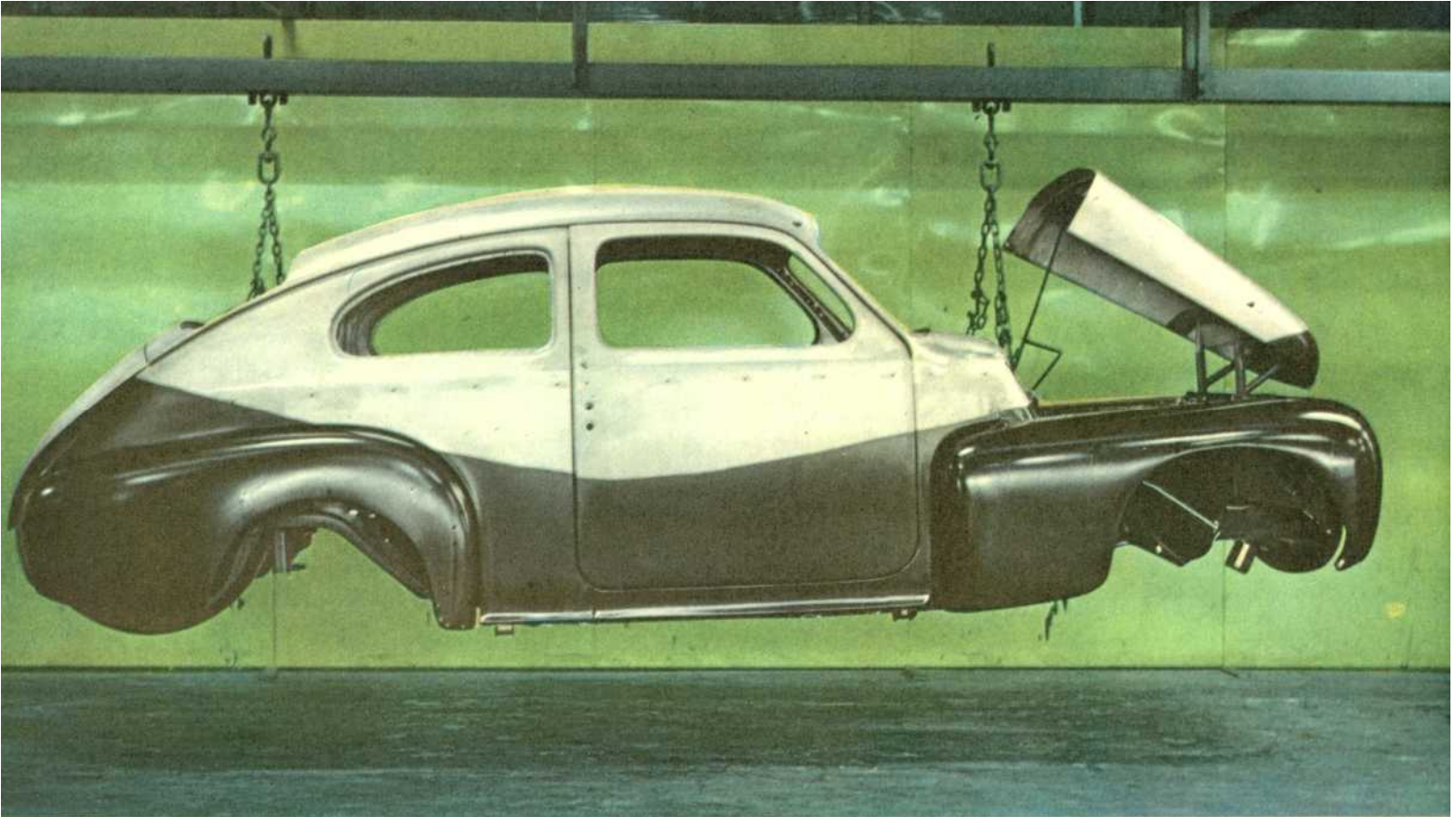


In Sweden, with its wide extremes of climate, a car must be able to take whatever comes along in the way of weather. And an occasional Volvo-owner in northern Sweden may well decide to take his car along on a vacation trip to Africa! That's why the Volvo development laboratory puts engines through conditions which pose every imaginable challenge. Here is a Volvo engine which has been chilled down to 40 deg. below zero -not unusual in the far north of Sweden.



The large Volvo development lab is always working towards the future. Here cars and engines are tortured to the limits of endurance. Here parts are analyzed. Here the search for new materials and methods never ends. The picture shows Volvo development engineers photographing the structure of steel through a microscope.





All Volvo bodies are rust-proofed throughout. The Volvo rust-proofing plant is one of the most modern in the world. During the one-hour trip the car bodies are degreased, rinsed, phosphatized, dried, and partly dipped in a paint-bath. They come out with every inch rust-proofed.

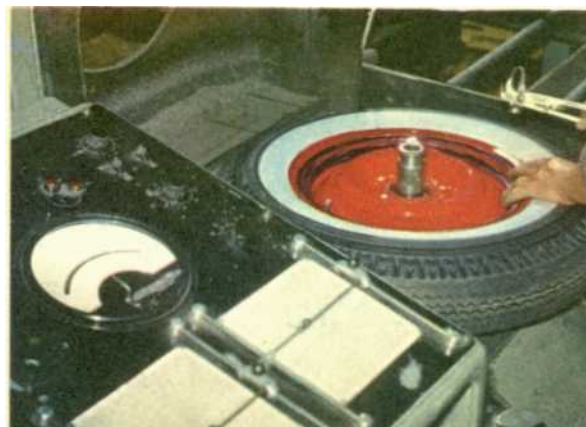
One of the spray booths in the painting department at Volvo. Volvo has one of the most advanced painting shops in the world with automatic and manual spraying. Although a never-ending stream of cars are sprayed with enamels in the spray booth, the air is always fresh and perfectly free from paint particles-the ventilation system renewing the air 650 times per hour!



The Volvo final assembly line. The operations are efficient and precise, and the inspectors-as in all Volvo departments-are highly skilled.

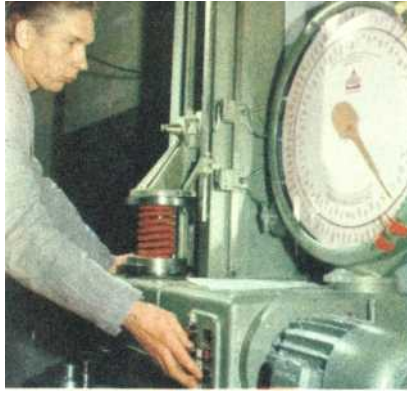
From these elements is produced the best-selling car in Sweden, victor over all foreign competition, victor even over the habitual Swedish love of all that comes from abroad.. Every Volvo owner, regardless of nationality, loves his car. It's fast, solidly built, durable, economical, easy to drive, maneuver and park. Something more: it's got that indefinable charm and personality which make it stand out from all other cars.

All wheels are balanced at the Volvo plant before assembly-a guarantee of maximum safety and minimum tire wear.



Inspection at Volvo

The Volvo inspection system is tough right from the start. All purchased materials and components are inspected at 40-odd stations. Then, as seen on the facing page, there are three inspections before painting; five inspections on the paint line; six inspections on the assembly line; inspections with lots of controls during the test-run; two inspections in the tune-up department; one hydrostatic test; one inspection in the rinsing department; and a meticulous final inspection. All Volvos go through the same scrutiny. In addition, there are a great many random checks which cannot be adequately described here. It is worth noting that each and every inspection on the assembly line includes from nineteen to forty-eight points, and that the inspection system itself is, in turn, rigorously inspected.



Testing springs at one of the forty inspection stations for purchased supplies.



Inspecting metal on newly-arrived bodies after degreasing.

Inspection of enamel base coat after spraying.



Inspection of enamel base coat after sanding.



Inspection of coolant thermometer for correct reading.



Inspection of brake cylinder for fluid, inspection of steering, motor and other components.



Inspection of front-end assembly work, heating system, and related parts.

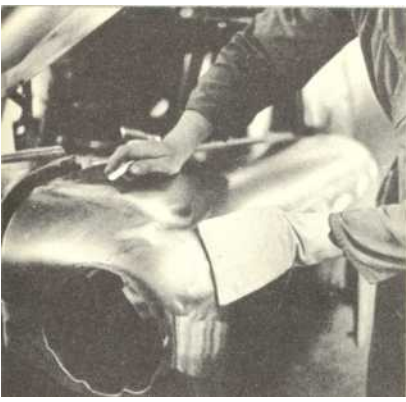
Five-mile test-run and tune-up of all accessories and controls.

Final inspection and final adjustment of steering wheel.

Inspection of lights, doors, wiring, gaskets - just about everything.

Inspection to see that any flaws found during test-run and in previous inspections have been corrected, plus a last-usually fruitless-search for faults.





Inspecting to make sure that any flaws found in previous inspection have been corrected.

Inspection of enamel top coat.



Inspection of rear axle housing and other sub-chassis elements for secure driving.

The water test. If the car gets through this high-pressure water dunking, it's not likely to leak later.



Overall final body examination before rust-proofing.

Final inspection of all painted surfaces.



Final inspection of all functions: checking wheel nuts with torque-wrench.

Inspection of enamel and trim before polishing.



The painting department: inspection of priming after watersanding.

Inspection of electrical equipment.



Inspection for flawless surface finish. Final approval.





The best components from the best suppliers make the best cars-that's the Volvo program

The Volvo tour is now over, and Philip and Janis are discussing what they've seen with the President of the Volvo Company.

"Well, Mr. Benson, do you think you've found the answer to your question, *What's behind Volvo quality?*"

"Yes, now I realize that the quality my wife and I admired so much, and

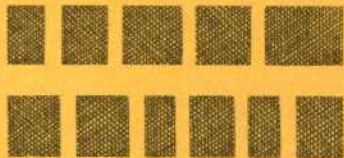
that made some of our neighbors a bit envious, is due largely to the conscientious and ambitious engineering and manufacturing specialists which Volvo has selected to build its subassemblies. You've been very lucky."

Mr. Engellau smiles. "Not just lucky. We've picked our subcontractors with great care. You visited four of them, but actually we have about one hundred and fifty suppliers in all parts of Sweden, all of whom have the same attitude towards their job-the same professional pride, you might say-as those you've seen. Every one of them sends us a product which can hardly be equaled anywhere. Volvo-owned companies and subsidiaries are just as uncompromising when it comes to quality. One of them is Svenska Flygmotor AB (the Swedish Aircraft Engine Co.), which makes all the jet and combustion engines of the Swedish Air Force as well as very advanced printing presses for the international market."

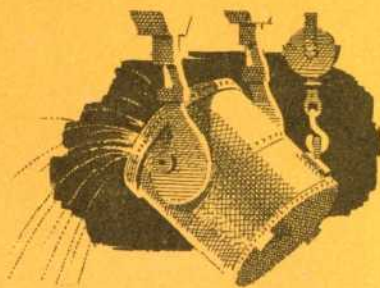
"And you still think you need the rigorous inspection system you have here at the Volvo plant?" Benson asks.

"Yes, we do. We have complete confidence in our contractors, but we still don't want anything left to chance. The possibility of any combination of errors affecting the quality of our automobiles must be eliminated. We're, naturally, proud of the cars we build, and we want all Volvo owners, whether in Gothenburg, San Francisco, Yokohama, Santiago, or Minneapolis, to have the same pride and pleasure in their own Volvo."

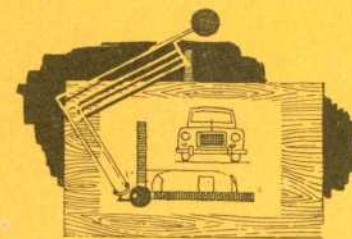
"Funny, that's just the way I feel!" says Philip Benson. And Janis agrees.



Inventive genius. The Swedes have technical imagination. It was a Swedish invention—the Johansson gauge blocks, the fundamental idea for the tolerance system—which first made possible the mass production of low-priced automobiles.



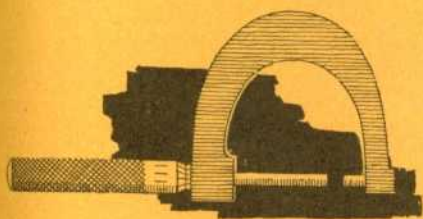
Swedish steel. Volvo has an invaluable advantage in Swedish alloy steels, unequaled for their strength and versatility.



Technical mastery. There are few countries which graduate so many engineers per thousand of population as Sweden. Swedish engineering schools are among the world's finest.



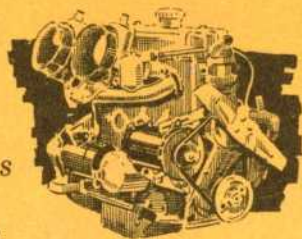
Generations of craftsmanship. The machine industry of Sweden is based on centuries of family and community tradition. Know-how and skill have been passed on from father to son—often through many generations.



Inspection. The Swedes are almost fanatic about inspections—troublesome at times, but an enormous advantage in making a precision machine such as the Volvo.

All this
is behind world-famous
Swedish quality-
the quality that identifies
VOLVO
of Sweden

Generous safety margins.

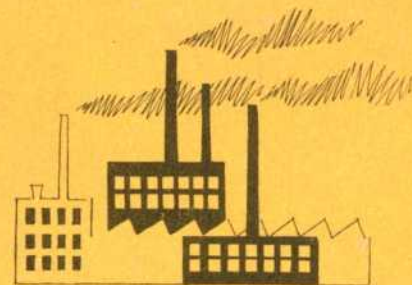


Better safe than sorry! The Volvo motor has a big margin of reserve: 85 h.p. with a displacement of 96.4 cu. inches. That means there's no danger of pushing it too hard. In bench-tests, 50 % greater horsepower has been obtained without damage.



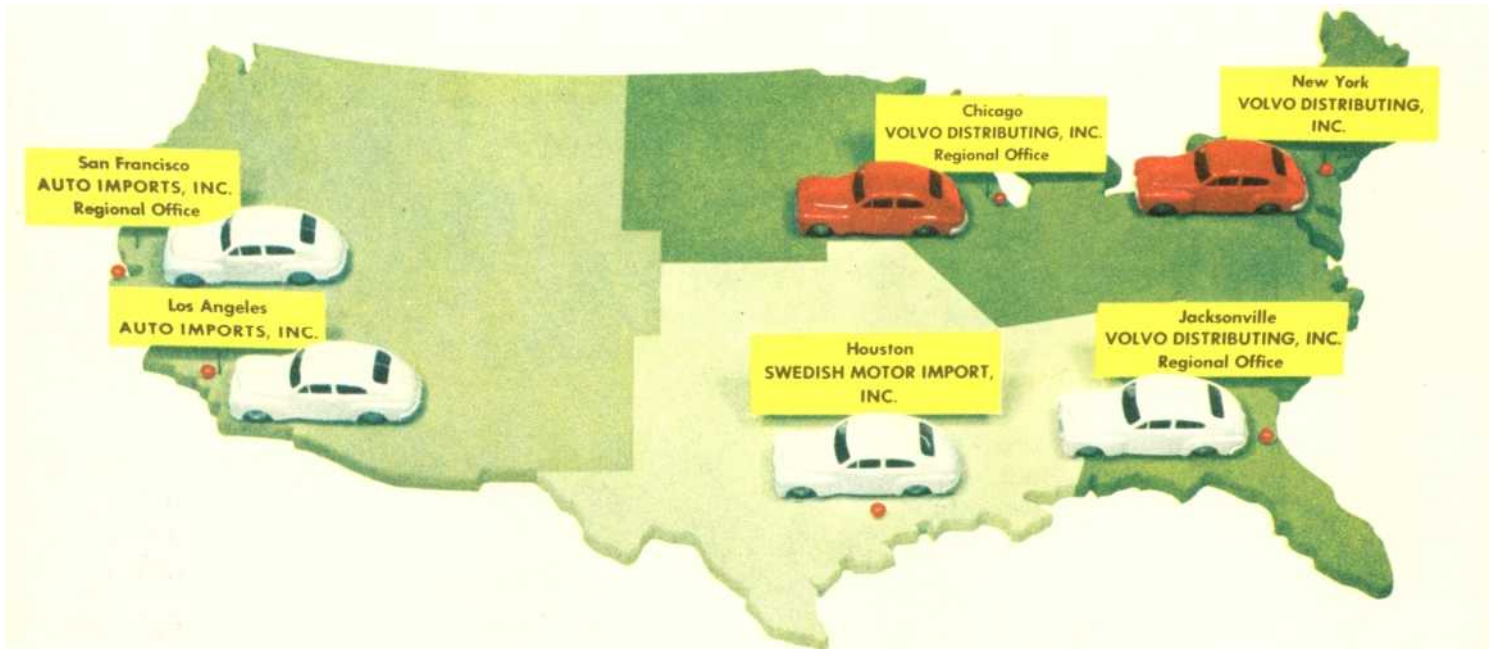
Bad roads, worse climate.

Hard winters and roads that are often in poor condition put the Swedish automobile manufacturer to tests not often exacted elsewhere. Volvo owners benefit accordingly.



Fine factories. Volvo and Volvo suppliers have the latest and best of production equipment.

VOLVOS ARE IMPORTED TO THE USA
BY VOLVO IMPORT, INC.
Englewood Cliffs, N.J.



400

From the beginning, distribution of Volvos in the USA has been based upon an efficient service and spare-parts organization.

Volvo Import Inc. is the Swedish factory's top organization in the USA. Cars are distributed by about 400 dealers working in three main territories. The map on this page gives a rough idea of how Volvo distribution is organized on the American market.

VOLVO DEALERS IN USA



INTRODUCING YOU TO THE VOLVO 122 S a beauty with many graces

A smart car embodying the sturdy qualities of engineering achievement and the restrained beauty of outstanding Scandinavian design.

Lines of grace that create true joy of ownership for the discriminating motorist. From any viewpoint and down to the smallest detail, the V O L V O 122 S is a perfect example of unobtrusive continental elegance that must be seen and experienced to be truly appreciated. A skilful blend of representative and sports characteristics, roominess and strength, this car is the natural choice of all those who value the subtle combination of these qualities while the range of body tones available is well in keeping with the personality of the car. The traditional aptness of Scandinavian styling and practical experience of the rigorous Swedish winters are responsible for the functional and graceful bodywork lines and traveling comfort even in the most severe weather and on the worst roads.

Generations of precision engineering lie behind the outstanding quality of manufacture and all the material used to build this graceful car.



**A PRODUCT OF
Superb Swedish Engineering**