
SAAB
SAAB TURBO

Saab Introduces the Power of the Future. The Turbo.

The SaabTurbo is an engineering masterpiece. Saab has taken the turbo power that dominates the big tracks—Le Mans and Indianapolis—and harnessed it to work at speeds you drive at everyday.

The SaabTurbo breakthrough is its ability to deliver 34% more torque at low 3500 rpm's. More torque at low rpm's means more power at your command in daily situations. When you have to pass, feel that surge of power shoot you ahead. Feel the take-off thrust of turbo power move you on to a highway. That's power!

Yet, the SaabTurbo isn't merely cold, engineering innovations. Its performance has definite psychic compensations. Here's how a few of the car experts have responded to driving one.

"Saab now has fetched up a model that'll get second gear rubber and double the double-nickel any day of the week . . . Saab'sTurbo installation offers more pleasure per dollar . . . than any other on the market."

Pat Bedard, Car & Driver.

"One heroic blast down the highway is enough to convert anybody."

David E. Davis, Jr., Car & Driver.

". . . SaabTurbo . . . a genuine Fourth-of-July driving experience, full of sudden pleasure and high spirit . . ."

Steve Thompson, Car & Driver.

"The SaabTurbo is exhilarating to drive . . . it's so much fun, the price is irrelevant . . ."

Road & Track.

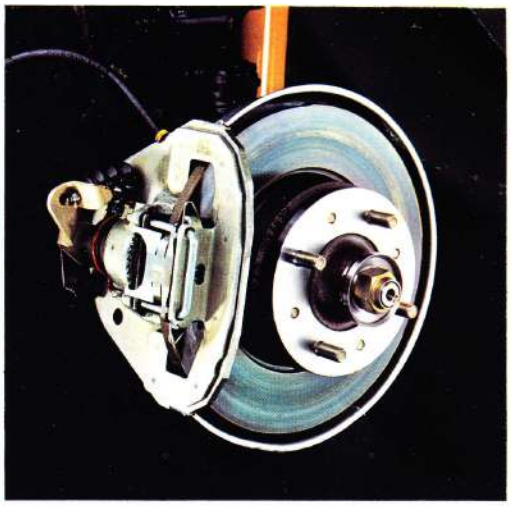
Yet, the Saab Turbo is a Lot More Than a Power Machine. Like Every Saab, it is a Consummate Road Machine.

Four-cylinder, 2-litre turbocharged fuel injection engine. The turbo-charging process captures energy normally passed out through the exhaust pipe and puts it back into the work process to obtain extra engine power.

Comprehensive instrumentation. Including tachometer and Turbo boost gauge which lets you monitor and control the turbocharger.

Coil springs combined with Bilstein gas shock absorbers all around to keep more tire on the road.

The rear spoiler improves stability and reduces fuel consumption at high speeds.



4-wheel power-assisted disc brakes. Braking application is uniformly firm and brake fade is virtually eliminated.

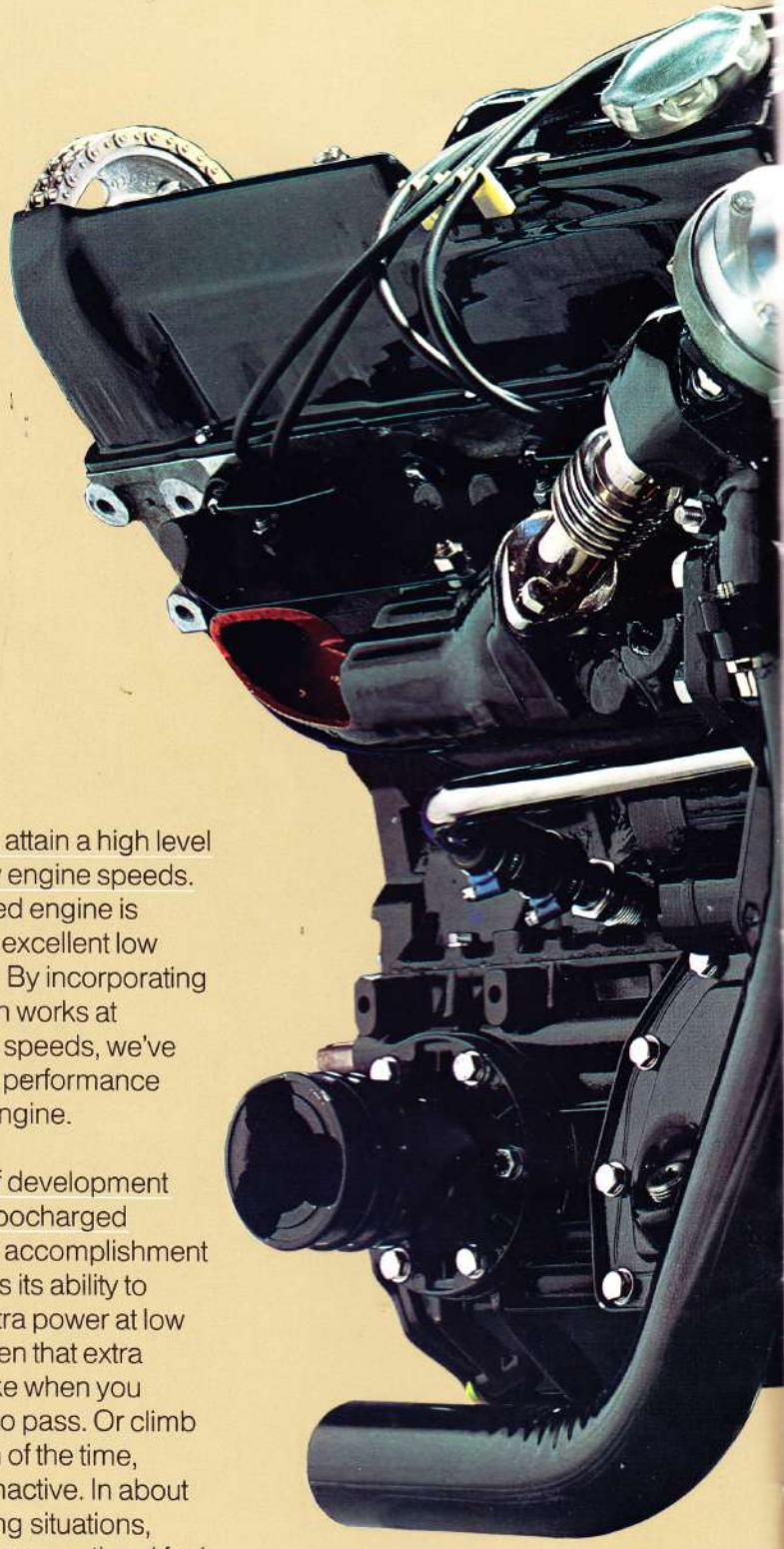
The SaabTurbo, An Exciting New Dimension in Driving.

Turbocharged engines have traditionally been reserved for powering very fast and expensive sports cars. Cars which were usually outside the reach of the average motorist.

A Turbocharged Engine Matched To a New Energy Approach.

The turbocharging of engines has been known for many years. The first turbocharged engine—a diesel engine for stationary applications—appeared during the 1930's. By the 1950's, turbocharging had matured sufficiently to be introduced on trucks and buses. The first turbocharged car was not launched until 1961. The primary aim in the turbocharging of car engines has been to attain as high a top speed as possible.

The aim in the development of the SaabTurbo was entirely different. Our primary goal was to match the turbocharged engine to present-day demands for better fuel economy, better environment through low exhaust gas emissions, and reduced noise levels. But without compromising the performance. High performance is obviously important for safe passing—and for the joy of driving, which is the ultimate proof of the general quality of this car.



A further goal was to attain a high level of power even at low engine speeds. The Saab fuel-injected engine is designed to provide excellent low speed performance. By incorporating a turbocharger which works at relatively low engine speeds, we've further improved the performance of our fuel-injected engine.

The result of years of development work: our unique turbocharged engine. The singular accomplishment of our turbocharger is its ability to start delivering its extra power at low speeds. But only when that extra power is needed. Like when you accelerate. Or want to pass. Or climb a steep grade. Much of the time, the turbocharger is inactive. In about 80% of normal driving situations, the engine runs as a conventional fuel injection engine—at its acknowledged low fuel consumption. But when you need power, the SaabTurbo is at your command.

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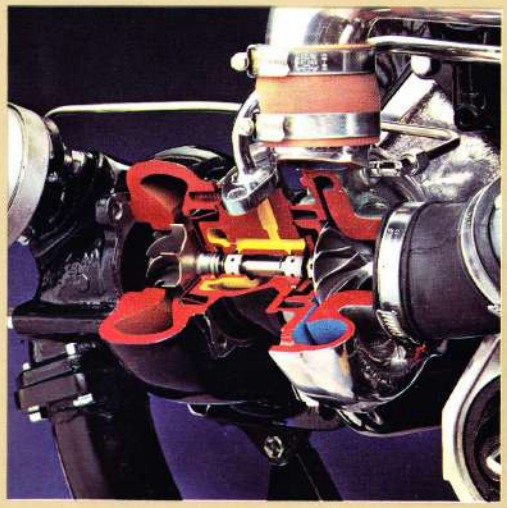


1 The Lambda sensor ensures that the fuel/air ratio will be ideal at all times, so that the three-way catalyst will always be fully effective in reducing emissions of regulated pollutants.

2 A small, light, exhaust gas driven turbocharger which comes into operation smoothly and provides a true surge of power.

The Saab Turbo Represents an Entirely New Approach in Turbocharging.

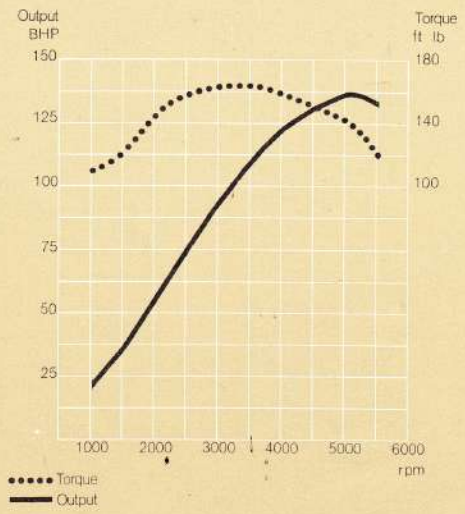
We have long searched for new ways to increase the performance of the conventional fuel injection engine. But we were not prepared to accept the disadvantages of the traditional approach.

If the maximum output of an engine is raised by increasing the number of cylinders or the displacement, the weight of the engine will increase and the efficiency under normal driving or part-throttle operation will be reduced. The fuel consumption of, say, a six-cylinder or eight-cylinder engine is thus high under all conditions. After all, the additional pistons are always running and consuming fuel, regardless of the actual power demand.

"Tuning" is another common means of increasing the performance of

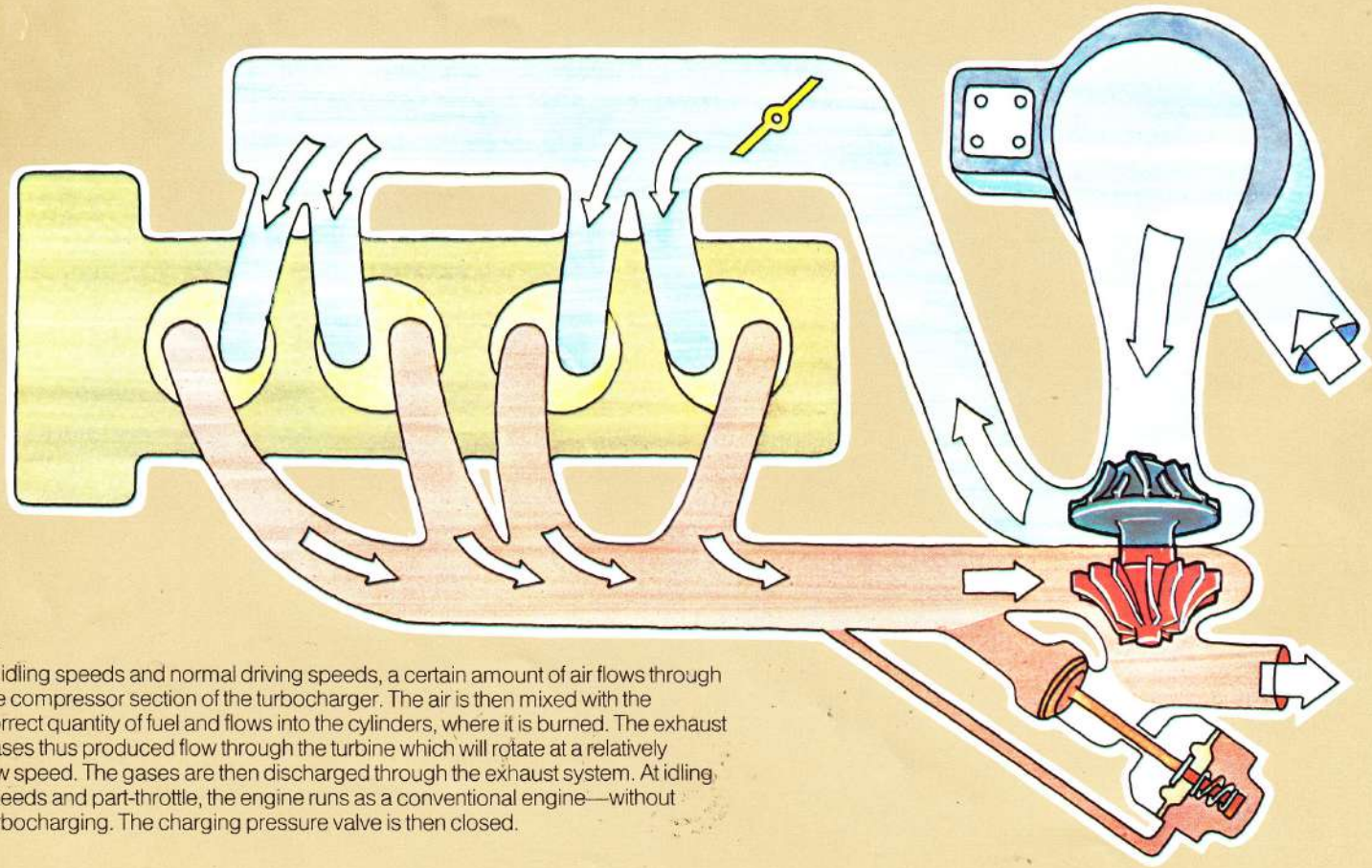
an engine. But tuning usually raises the peak engine speed and thus causes increased wear. A higher compression ratio, optimized valve timing, etc. improve the peak performance. But our main aim was to produce an engine with high torque and power at lower engine speeds, since this offers appreciably improved acceleration and, in our opinion, is a more sensible approach for today's driving needs.

This is how a traditional turbocharger works: The turbocharger consists of a turbine and a compressor, mounted on the same shaft. The turbine is driven by the exhaust gases from the engine. The larger the throttle opening and the higher the engine speed, the larger the flow of exhaust gases. And the higher the speed of the turbine.



At exactly the same rate, the compressor delivers fresh air to the cylinders at a higher pressure than normally. The quantity of air is thus larger than when the engine draws the air itself. This extra air and a suitably matched additional supply of fuel, generates more energy during every piston stroke. The torque will be higher and this, in turn, results in a greater engine power.

We have matched the turbocharged engine to everyday needs—ahead of all other car manufacturers. We owe this primarily to the stur-

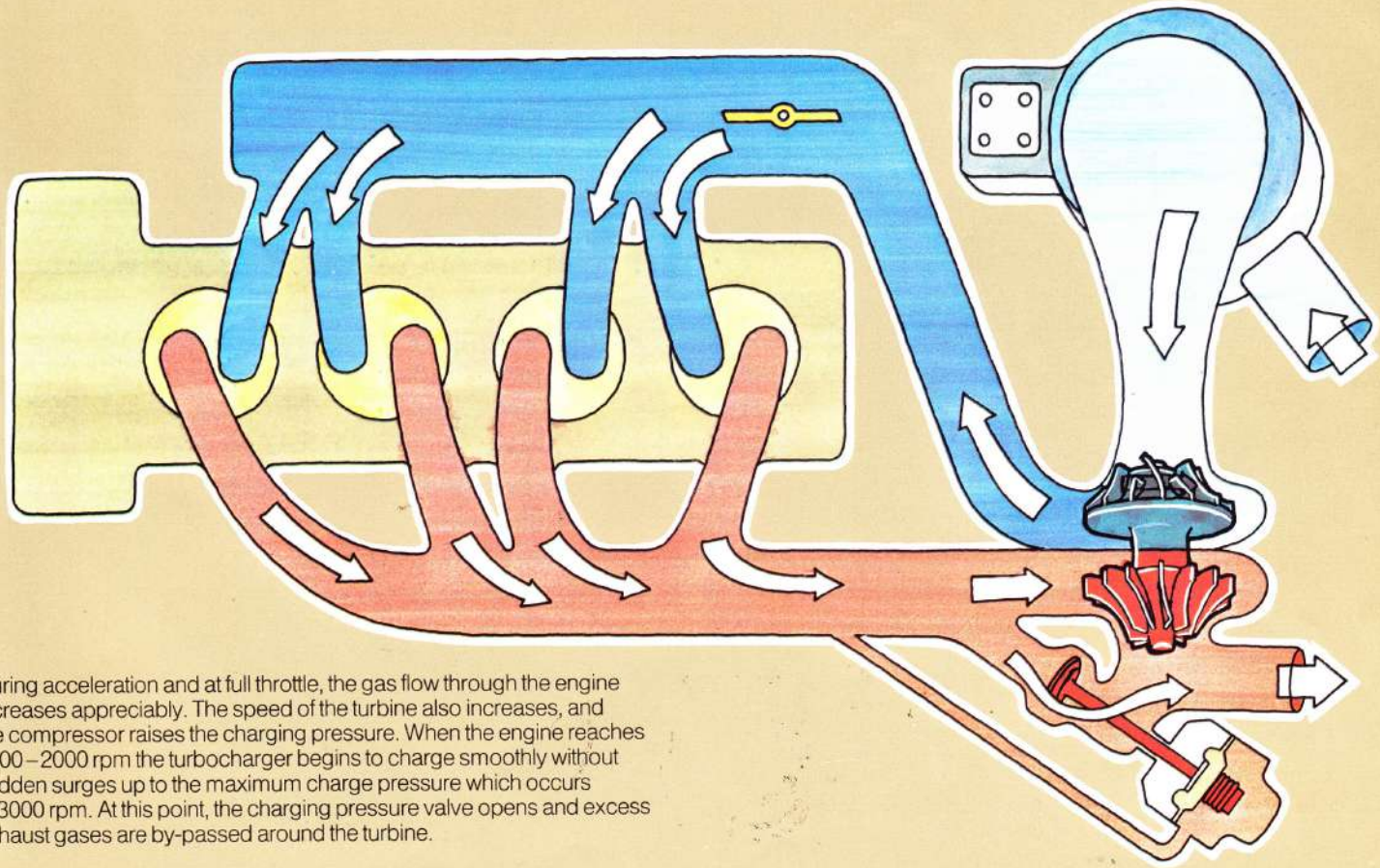


At idling speeds and normal driving speeds, a certain amount of air flows through the compressor section of the turbocharger. The air is then mixed with the correct quantity of fuel and flows into the cylinders, where it is burned. The exhaust gases thus produced flow through the turbine which will rotate at a relatively low speed. The gases are then discharged through the exhaust system. At idling speeds and part-throttle, the engine runs as a conventional engine—without turbocharging. The charging pressure valve is then closed.

diness of the standard Saab engine. Since its basic components already incorporate extra reserves of strength, turbocharging involved relatively modest modifications.

The engine of the SaabTurbo is different than other turbocharged engines. Significantly different. With high-performance sports cars, high output at high speeds is crucial. What we wanted to accomplish was to achieve high torque output at low speeds to make turbocharging effective in the range of road speeds where extra power is particularly important. So, our turbocharger comes in at engine speeds around 1500–2000 rpm and produces maximum torque at 3500 rpm. This way, the excitement and joy of driving a turbocharged engine is well within the reach of the average driver. And how successful were we? Just listen to what David Abrahamson of Car & Driver has to say, "The new SaabTurbo is a genuine performance car; strong, supple, good off the line, fast through the corners, whisper smooth and lovingly screwed together."

The charging pressure valve has an important function. On a turbo engine, the turbocharging pressure must be carefully controlled. If the charging pressure is too high, the combustion temperature may also be too high, and this may result in pre-ignition and damage to the engine. The SaabTurbo is therefore equipped with a unique charging pressure valve which effectively controls the charging pressure. When the turbocharging pressure valve is open, excess exhaust gases by-pass the turbine. This ensures that the charging pressure will be maintained at the correct level throughout the engine speed and load range.



During acceleration and at full throttle, the gas flow through the engine increases appreciably. The speed of the turbine also increases, and the compressor raises the charging pressure. When the engine reaches 1500–2000 rpm the turbocharger begins to charge smoothly without sudden surges up to the maximum charge pressure which occurs at 3000 rpm. At this point, the charging pressure valve opens and excess exhaust gases are by-passed around the turbine.

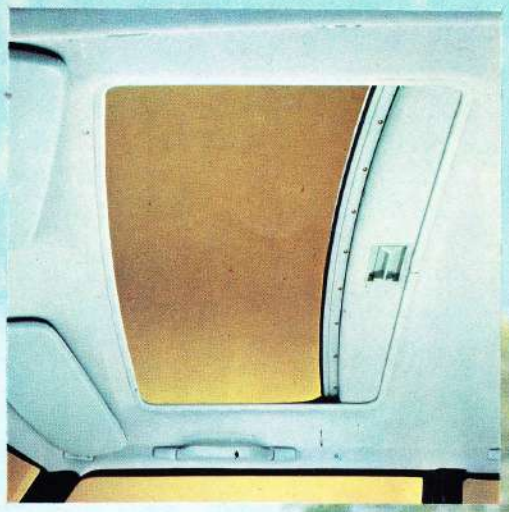
A Stunning Combination: Big Car Comfort and Sports Car Performance.

The SaabTurbo has much more to offer in terms of comfort than most other cars. An interior that gives ample comfort for five adults. Well insulated and silent, even at high speeds. Front seats which are among the most comfortable available today. And with extra adjustments for the driver's seat. A back seat which is comfortable and a broad 60" wide at the elbow level. A heating and ventilation system with extra capacity. A luggage compartment with a capacity of 15.4 cu.ft. and which can easily be converted to a "cargo space" of 53 cu.ft.

Add to this the sports car performance and a top speed of over 110 mph and you have a car which is unique and pace-setting.

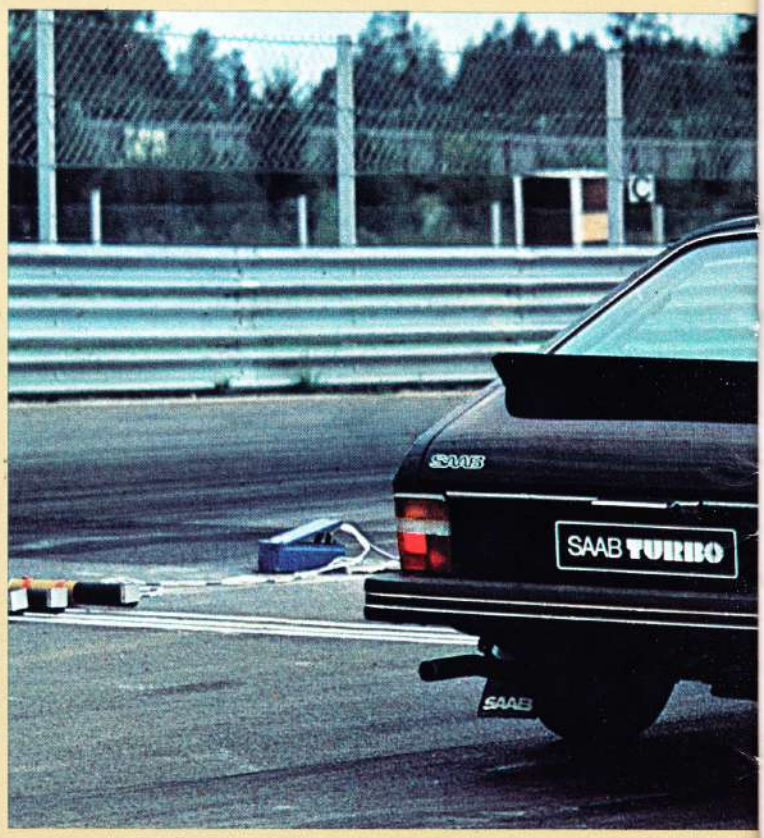
An interior tailored in elegant Bordeaux Red.

The back seats. Exceptionally spacious. Plenty of elbow room. And, thanks to front wheel drive, no awkward 'hump' to push one's legs into one's chest.



The sliding steel sun roof is standard equipment.

When you fold down the back seat of the SaabTurbo, you'll have an enormous amount of space. Ideal for luggage, skis, camping gear, etc.



Our preliminary work on turbocharging began back in the early 1970's. When the 1974 oil crisis hit, and with it, the increased demand for moderate fuel consumption even for high-performance cars, we were prepared. By that time, we already had a big leg up on a turbocharger solution.

Bench tests in a sophisticated engine laboratory. We have obtained ample proof that the mechanical stresses have not been significantly increased by turbocharging. On the contrary, the turbocharged engine has become more reliable, due to the reduced compression ratio and the waste gate concept.

High-speed tests in Germany. The characteristics of the engine have also been tested under the conditions often prevailing on the European Continent. Some of the tests have been run by the Swedish rally drivers, Stig Blomqvist and Per Eklund, who covered nearly 75,000 miles at speeds around 100–110 mph.

Winter tests in Canada. One of our test cars was driven over a 14-day period at White River, at temperatures below –40°F. The tests were focused mainly on road behavior, starting, performance of the crankcase ventilation and the air preheating.

High-temperature tests in Death Valley in the USA. We chose Death Valley —one of the hottest places in the USA —to run our high-temperature tests to check the cooling system and test the general performance of the engine under extremely hot conditions. The series included testing the Saab Turbo on mountain passes at an altitude of over 6500 ft.—while towing a fully loaded trailer. In other words, under extremely difficult conditions.

High-altitude tests in the Rocky Mountains. Tests at very high altitudes in the Rocky Mountains revealed that the loss of power normally occuring at high altitudes is less pronounced on the SaabTurbo.

General tests on the road. Our testing has not been confined.to high-speed tests on fast motorways. We have also run long-term tests on particularly difficult roads in Sweden Test cars powered by turbo-charged engines have covered a total distance of more than 930,000 miles. This corresponds to 37.5 times the circumference of the earth.

Broad tests by 100 test drivers, most of them "private motorists". For a period of six months, 100 private individuals and professional drivers in Sweden, Finland, Germany, Switzerland and the USA have each been given a Saab Turbo to use. The reactions have been very favorable throughout. Not only regarding the performance of the turbocharged engine, but also the general character of the car.

Impartial, comparative tests have more to tell about the SaabTurbo.

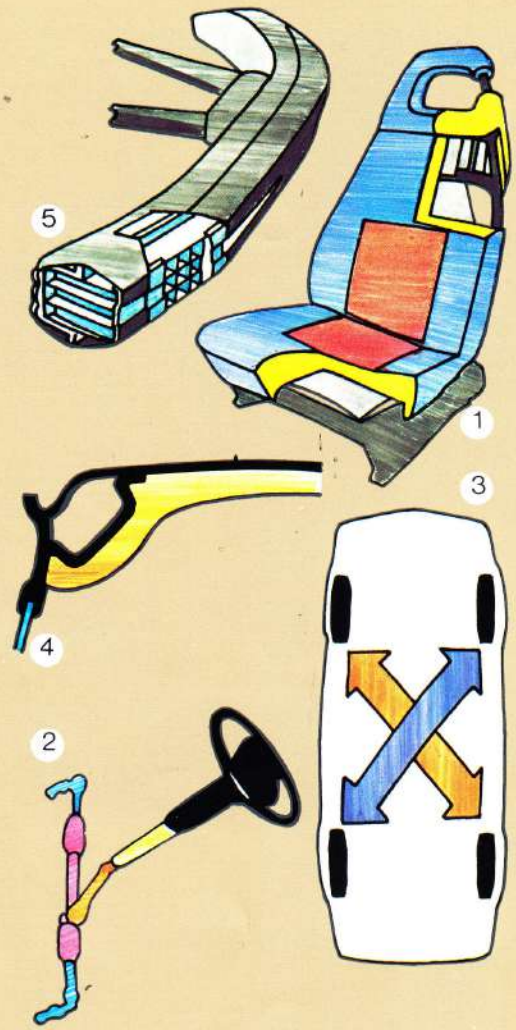
Many of the world's leading motoring periodicals have had their say about the SaabTurbo. Many have also undertaken more comprehensive comparative tests, which reinforce further the image of the SaabTurbo as a very lively, safe, roomy and practical car.

Saab Has Often Been the Leader in a Straightforward But Unconventional Approach.

The Saab seats (1) offer superb comfort. The seating is comfortable, mainly owing to the firmness of the padding and the carefully dished seat and backrest. And the seating position can easily be adjusted. The driver can alter the height and slope of his seat. In addition, the seat and also the backrest are electrically heated—an idea which Saab developed long before other car manufacturers.

We were early to appreciate that rack-and-pinion steering (2) is the ideal system for cars with front-wheel drive. Rack-and-pinion steering provides accurate response to the slightest movement of the steering wheel. As in many other cases in the past, other car manufacturers now follow our lead.

Saab was one of the first car manufacturers in the world to produce a dual circuit brake system (3). We chose to run the two brake lines diagonally. As a result, if one circuit should fail, braking will still be available on one front wheel and the opposite rear wheel. And the distribution of the braking effort onto the front and rear wheels will still be as favorable as under normal conditions.



For further safety, all Saab cars are equipped with a thick, separate roof-lining (4) of molded fiberglass, which is not only impact-absorbing but also insulates against heat, cold and noise.

When the strength of bumpers was the subject of legislation in the USA in 1972, our impact-absorbing bumper (5) was already on the production line. We were thus the first among the world's car manufacturers to conform with these stringent requirements. Saab-bumpers are based on the principle of cellular plastic blocks which are compressed in the event of impact, but then resume their original shape and function.

The SaabTurbo. The Power Of the Future.

Technical Specification SaabTurbo, 1978.

Engine.

General description. Four-cylinder, liquid-cooled, in-line engine with overhead camshaft. Longitudinally arranged in the engine compartment. Integrated with the clutch, gearbox and differential. The engine block slopes at 45°. The engine block is made of alloy cast iron. The cylinder head is made of light alloy. The crankshaft and camshaft are both mounted in five bearings. Camshaft and pistons of special type. Turbo-compressor. Sodium cooled exhaust valves. Three-way catalyst, decel solenoid.

Dimensions and performance. Displacement 121 cu in (1985 cm^3). Cylinder bore 3.54 in (90 mm). Piston stroke 3.07 in (78 mm). Compression ratio 7.2:1. Net horsepower SAE 135 hp (100 kW) at 5000 rpm. Torque 160 ft. lb. (216 Nm) at 3500 rpm. Weight/power ratio 21.1 lb/hp (9.6 kg/hp). Top speed over 110 mph. Acceleration from 0 to 60 mph in 9.5 seconds.

Fuel system. Mechanically controlled, Bosch CI fuel injection with Lambda control. Fuel requirement, unleaded, 87 pump octane (91 RON). Capacity of fuel tank 14.5 US gals (55 litres).

Turbocharging system. Turbo-compressor of Garret manufacture, charging pressure regulator with diaphragm-controlled, spring-loaded valve. Safety system with pressure switch. Maximum charging pressure: 0.50±0.05 bar.

Electrical system. 12 V/60 Ah maintenance free battery. 14 V/65 A alternator. Bosch breakerless ignition system. 1.1 hp (0.8 kW) starter motor.

Cooling system. Of pressurised type. Uprated cross-flow radiator and separate expansion tank. Liquid capacity 8.5 US quarts (8 litres). Electrically driven, thermostatically controlled fan. Thermostatically controlled, air-cooled oil cooler for the engine oil.

Power transmission.

General description. Manual gearbox. Single disc, dry, heavy duty clutch. Clutch and primary reduction located at the front of the engine. The gearbox and differential are below the engine. Primary chain drive. Two permanently lubricated drive shaft universal joints for each front wheel.

Reduction ratios. Engine/drive shaft: Bottom gear 12.0:1, second gear 7.3:1, hird gear 4.9:1, fourth gear 3.5:1, reverse gear 13.2:1. Primary reduction 0.9:1. Final drive ratio 3.89:1.

Chassis.

Brakes. Disc brakes all around. Brake pad area 35.3 in^2 (228 cm^2). Total swept area 392 in^2 (2527 cm^2). Diagonally split, dual circuit hydraulic foot brake system, with 9-inch vacuum servo. Self-adjusting foot brake and handbrake. Handbrake acting on the front discs. Outer front brake linings of semi-metallic type.

Wheel suspension, springing. Independent double wishbones and pivot mounted coil springs at the front. Lightweight rigid rear axle, with twin leading and trailing radius arms, Panhard rod, coil springs. Double-acting, telescopic, gas sh ck absorbers of Bilstein manufacture all around.

Steering. Rack-and-pinion steering. 3.4 steering wheel turns lock-to-lock. Jointed and telescopic steering column. Turning circle diameter 34.4 feet (10.5 metres).

Wheels and tires. Aluminum alloy wheels of special design (spare wheel of pressed steel). Wheels: 5 1/2 J×15" H2. Tires: 175/70 HR 15, Pirelli CN 36, steel belted radials.

Dimensions and weights.

Overall length	179 in (4550 mm)
Overall width	66.5 in (1690 mm)
Height, unladen	56.7 in (1440 mm)
Wheelbase	97.4 in (2473 mm)
Track, front	55.5 in (1410 mm)
Track, rear	56.3 in (1430 mm)
Max. load length, back seat folded	71.7 in (1821 mm)
Trunk capacity, SAE, parcel shelf removed	15.4 cu.ft. (435 litres)
Trunk capacity, total, back seat folded	53 cu.ft. (1500 litres)
Curb weight, approx.	2700 lb (1230 kg)
Gross vehicle weight	3810 lb (1730 kg)

Equipment.

Aluminum alloy wheels (spare wheel of pressed steel). Front spoiler. Rear spoiler. Sun roof. Effective bumpers—"self-restoring" after a low-speed impact. Large well-arranged and non-glare electrically controlled outside rear-view mirrors. Reversing lights. Windshield wipers with interval operation relay. Tinted glass windows. Openable rear side windows. Reflector on driver's side door edge. Built-in towing hooks front and rear.

Padded three-spoke sports steering wheel. Comprehensive set of warning and indicating lamps. Speedometer, tachometer, turbo boost gauge, coolant temperature gauge, fuel gauge, clock, odometer, tripmeter. Controls with illuminated symbols. Stereo loudspeakers in the doors. Interior day/night rear-view mirror on collapsible mounting. Tough shield beneath the instrument panel to protect the knees. Roof lining of molded glass fibre.

Seats with integral lumbar support and head restraints. Bordeaux red plush seats. Electrically heated driver's seat. Inertia reel-type seat belts. Grab handle above the passenger door. Folding center armrest at the rear. High capacity heating and ventilation system with 12 air outlets. Electrically heated rear window.

Non-glare interior lighting. Map reading light behind rear-view mirror. Fully lit glove compartment and luggage compartment. Courtesy light operates automatically from every door. Automatic light control—the headlights and exterior lights are switched off when the ignition is switched off.

Adjustable luggage compartment. Extra luggage space underneath a panel at the extreme rear of the luggage compartment. Easily accessible spare wheel. Luggage compartment floor fully carpeted. Fabric-covered, removable parcel shelf.

Exterior colors: Cardinal red metallic, Black, Sterling silver metallic, and Anthracite grey metallic.

■ The manufacturer reserves the right to make changes at any time and without notice.

■ A Tourist Delivery Plan is available. Your dealer will supply specific information.

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