SEDAN COMPARISON: AUDI, PEUGEOT, SAAB & VOLVO

Road Test—4.5-Liter Mercedes-Benz 350SLC

ROAD & TRACK®

NOVEMBER 1972 UK 25p SWEDEN KR. 6.50 INKL. MOMS SEVENTY-FIVE CENTS

ELECTRONIC IGNITION SYSTEMS TESTED & COMPARED

The Ultimate Porsche 911—New BMW 520, AUDI 80

FOUR FAMILY SEDANS

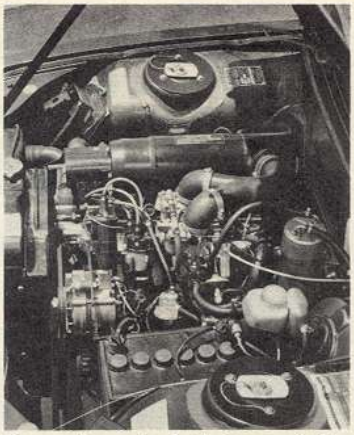
One from Germany, two from Sweden and one from France—with distinct differences in style, engineering & quality

PHOTOS BY PHIL STOTTS

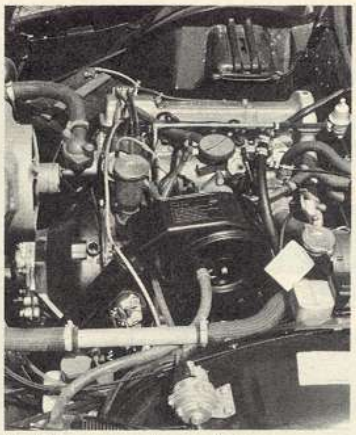
THOUGH THE AMERICAN car industry is well into small cars with its Pinto and Vega now, there remain distinct gaps in the choice of car types available in domestic models. As is traditional with the U.S. carmakers, one is the combination of a high degree of quality—both design and assembly—with compact size. In general, this is where the imported makes come in, and particularly the Europeans.

Say, for instance, that one wants a relatively small 4-door sedan in which to transport a family. There's enough budget to buy something well above the minimum, and more room

Audi: it's all up front.



Peugeot's engine is slant-mounted.



Saab's overhead-cam four.

Volvo—no carburetors here.

is needed than Pinto, Vega, Datsun, Cricket et al offer as well as more performance and refinement. The next step up in American cars would be the Hornet-Valiant-Nova-Maverick class, and though these are big enough (perhaps too big) they are engineered and finished as low-priced cars, offering little more than the minimum in suspension, brakes or comfort details.

So one turns to the imports and finds an interesting array of sedans that are Europe's middle-class cars. There's considerable technical variety and originality in them, they seem to be intelligently designed, they're not subject to the yearly obsolescence foisted upon middle-class American cars, they get decent fuel economy, and their chassis designs most probably were conceived with brisk driving styles, rather than the doddering U.S. style of driving, in mind.

Four sedans from Europe fall neatly into this category: Audi 100, Peugeot 504, Saab 99E and Volvo 140 series. They're all 4-5 seaters with adequate, but not lavish, space for four fullsize people and trunk capacity to match. They have 4-cylinder engines of about 2-liter displacement with 4-speed manual transmissions as standard equipment. One—the Saab—is very little longer than a Vega, and the longest one, the Volvo, is still shorter than the Maverick 4-door while containing considerably more space inside. In short, these are cars with the emphasis on efficiency and practicality, not high style although the Audi has a measure of that too. They're all rather tall and have exceptional ground clearance.

They all cost nearly $4000, so they must justify what seems a high price relative to their size and power (in America bigger is better!) by technical sophistication not available in the U.S. cars. Three of the four cars in this group, for instance, have 4-wheel disc brakes, something not available on any American sedan. Radial tires are standard on all of them, and their chassis were planned from the beginning for radials. All have unit steel body-chassis construction. Two in the group have front-wheel drive, again something one doesn't get in a practical-size ⟶

GENERAL DATA

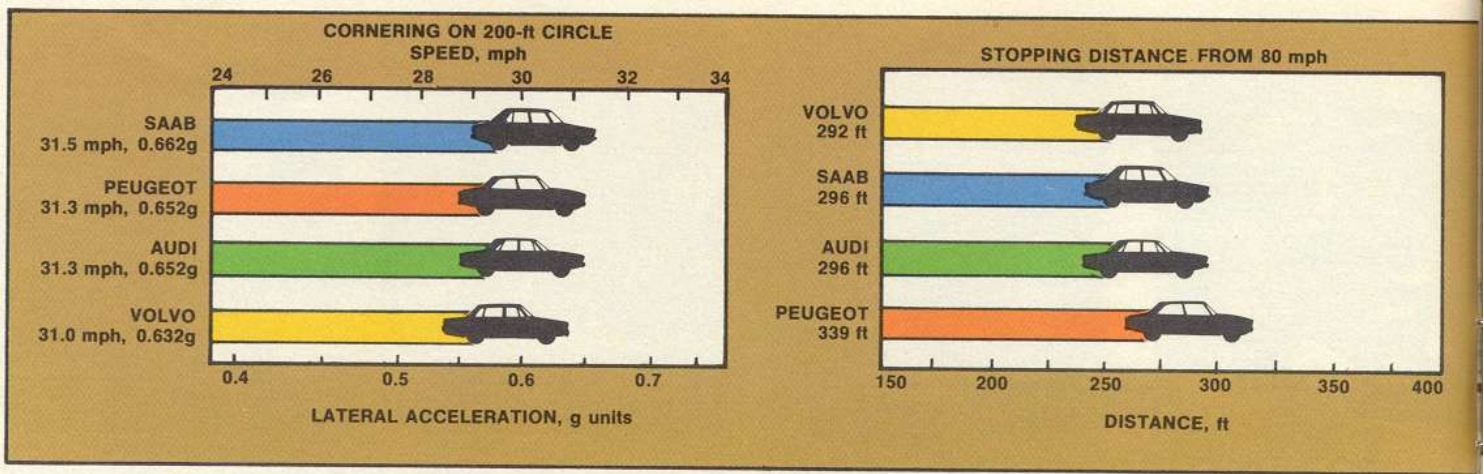
	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Basic POE price*	$3955	$3735	$3795	$3955
Price as tested*	$4436	$3795	$3850	$4531
Engine position/ driving wheels	f/f	f/r	f/f	f/r
Body/frame	unit	unit	unit	unit
Curb weight, lb	2480	2690	2520	2735
Test weight, lb	2840	3035	2880	3095
Distribution, f/r, %	60/40	53/47	60/40	52/48
Wheelbase, in	105.3	108.0	97.4	103.0
Length	182.6	177.0	172.0	182.7
Width	68.1	66.5	66.5	67.1
Height	56.1	57.5	56.7	57.3
Ground clearance	6.2	6.5	6.8	6.5
Tire size	165-14	175-14	155-15	165-15
Fuel capacity, U.S. gal	15.3	14.7	11.9	15.3

*POE prices can vary slightly for east, west and Gulf ports; given for west coast. As-tested prices include dealer prep for all cars; for Audi, automatic transmission, radial whitewall tires, tinted glass, vinyl upholstery; for Volvo, air conditioning, AM/FM stereo radio, armrest glovebox.

ENGINE & DRIVE TRAIN

	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Engine type	L4 ohv	L4 ohv	L4 sohc	L4 ohv
Bore x stroke, mm	84.0 x 84.4	88.0 x 81.0	87.0 x 78.0	88.9 x 80.0
Displacement, cc	1875	1971	1854	1986
Compression ratio	8.2:1	7.5:1	9.0:1	8.7:1
Bhp @ rpm, SAE net	91 @ 5200	92 @ 5500	97 @ 5200	112 @ 6000
Torque @ rpm, lb-ft	111 @ 3500	120 @ 3000	105 @ 3200	115 @ 3500
Fuel system	Solex 2-V carb	Solex 2-V carb	Bosch elec. inj	Bosch elec. inj
Fuel requirement	91-oct	91-oct	91-oct	91-oct
Transmission	4-sp man	4-sp man	4-sp man	4-sp man
Optional	3-sp auto	3-sp auto	3-sp auto	3-sp auto or overdrive
Standard final drive ratio	3.89:1*	3.89:1	4.22:1	4.10:1
Engine speed @ 70 mph, rpm	3870	3700	4020	3800

*Audi has indirect 4th gear



FOUR FAMILY SEDANS

domestic; and one of the two rear-drive cars, the Peugeot, has independent rear suspension. Two of them have electronic fuel injection to get emission control along with clean running, and the Saab has pioneered crash bumpers of the type U.S. legislation mandates for 1973. They don't look bad either, as so many of next year's bumpers do.

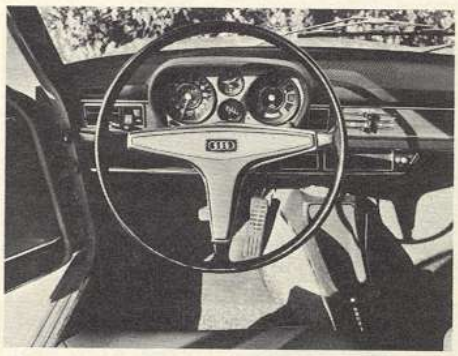
All four cars in the group have attractive interiors in which bits of equipment like carpeting, cigarette lighters, trip odometers and fully adjustable seatbacks are standard, and on one or more cars in the group there are items like tinted glass, heated rear window, folding rear armrest and a clock as standard equipment. These are cars that are essentially fully equipped and their option lists are short.

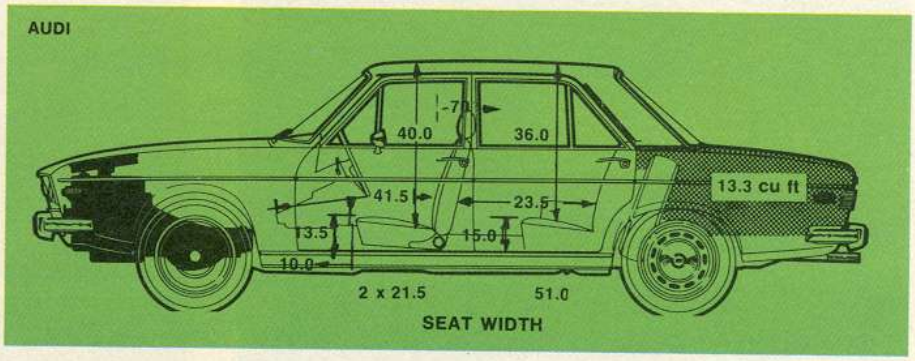
All four are available with a 3-speed automatic transmission at extra cost. Air conditioning can be ordered on all, but on three of them it's an add-on unit installed in the U.S. and may not be as satisfactory or well integrated into the interior as it is on U.S. cars.

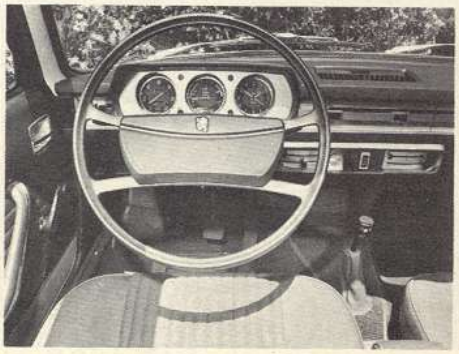
In this group the Audi, Saab and Volvo can be had as 2-door sedans (and the Volvo and Peugeot as 4-door wagons); but we wanted to try the 4-door sedans because of their all-around utility value. This eliminated the BMW 2002, a smaller and sportier 2-liter and strictly a 2-door. Another possibility, the Alfa Romeo 2000 Berlina, is a 4-door of relatively sporting nature but roomy accommodations. Believe it or not, we couldn't get the Alfa for this test, but since it's built only with a 5-speed manual transmission for the U.S. its appeal may be to a different sort of buyer than the one attracted to the four cars we did test.

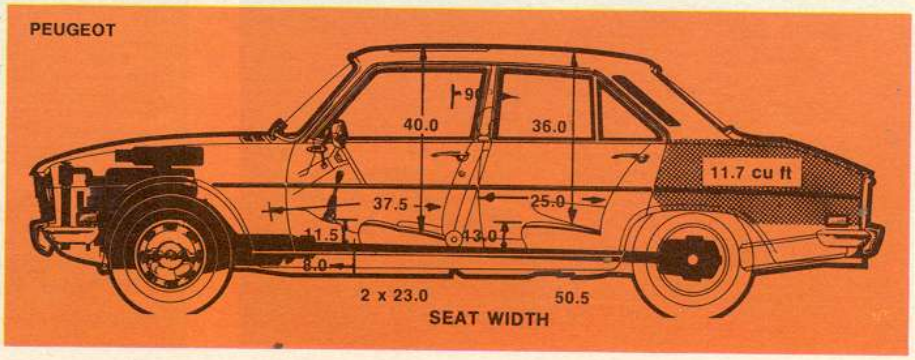
The Cars

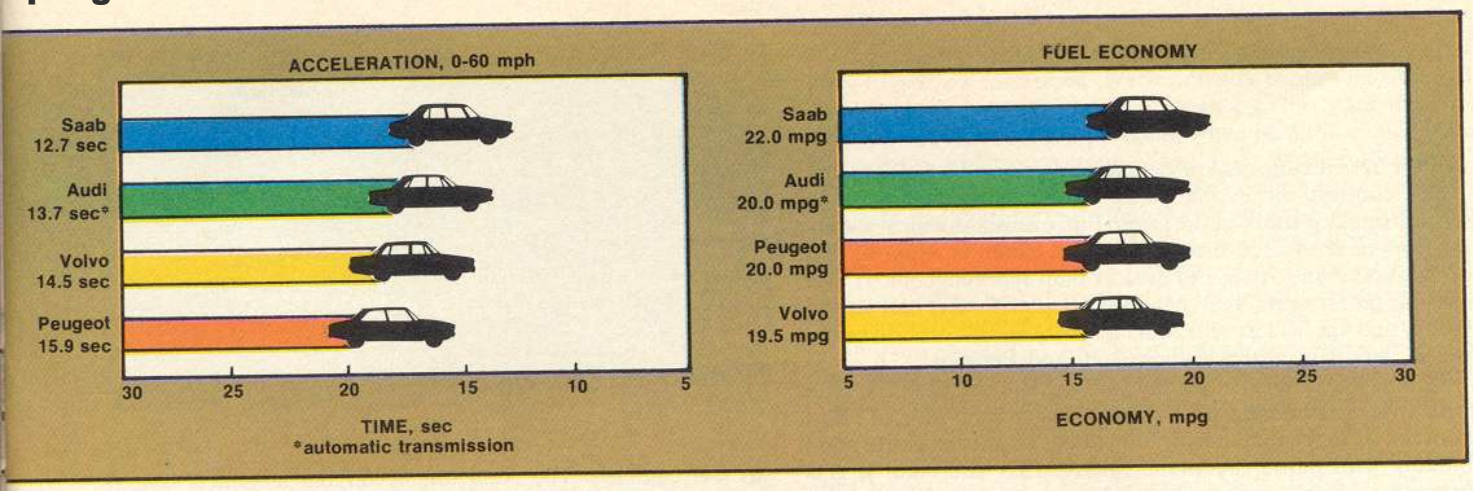
THE AUDI is the most stylish car of the group and within a tenth of an inch of being as long as the Volvo; it's also the widest and lowest of the four. But it's also the lightest. Audi has a smaller, less attractive series, the Super 90, but it's the 100, with its (intentionally, we're sure) Mercedes/BMW-like styling inside and out that has put the make on the U.S. map. Our test car was the familiar 100 LS; recently Audi has added the plainer 100 and fancier 100 GL to the U.S. line but all are mechanically identical. This means an inline 4-cyl pushrod-ohv engine of Mercedes design—Mercedes was part owner of the manufacturer Auto Union when the engine was designed—mounted 'way forward and canted to the right, driving the front wheels. The engine is carbureted and there have been serious problems since the beginning of the 1972 model











run with driveability; we understand now that if the latest Solex carburetor is adjusted right to the rich limit of the factory specifications the engine will run decently.

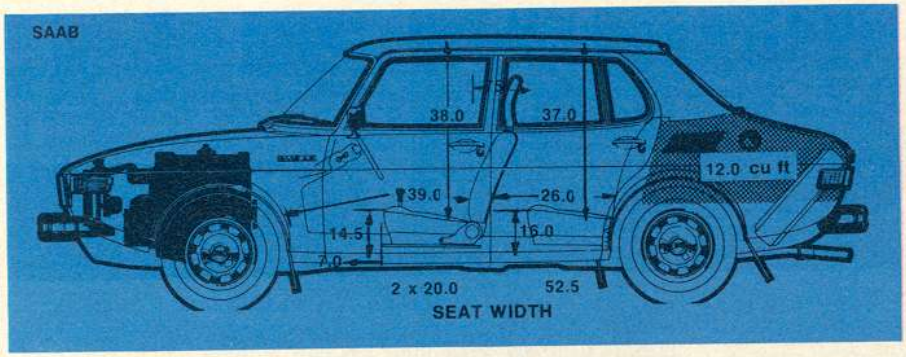
The Audi front-drive package puts the front disc brakes inboard, right next to the differential, and though the disc/drum system performs well there has been a wear problem. Average life for the brake pads is around 6000 miles and dealers generally have replaced them four times during the longer-than-usual warranty period. The very latest production examples now have larger brake calipers but at this point we don't know if they have solved the problem.

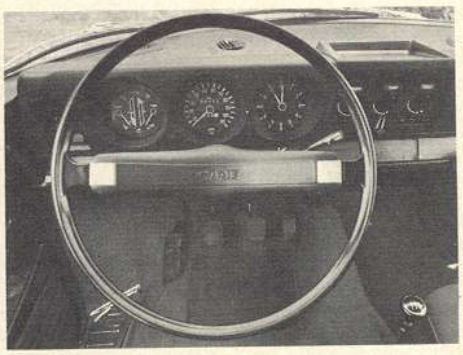
But the Audi mechanical layout produces an exceptionally efficient automobile, with a roomy interior and large trunk in a handsome and compact exterior package, and Americans have taken to it to the tune of over 20,000 sales per year.

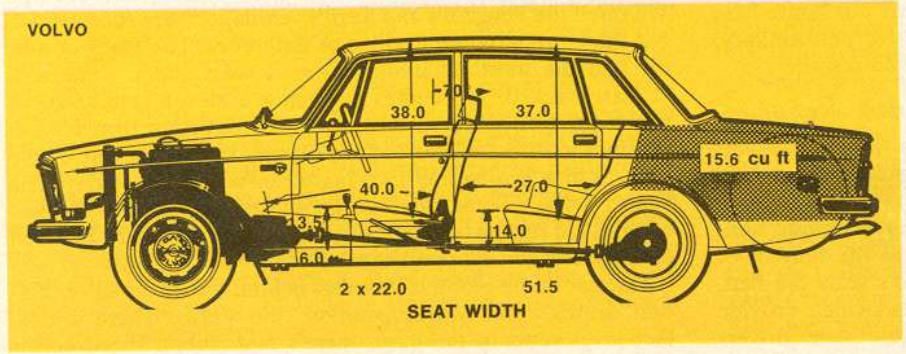
Peugeot, by contrast, has been selling cars here for a long time but never has built up much sales volume; currently the make's sales run about a fourth of Audi's and this means dealers are harder to find. Peugeots have the reputation of sturdy, dependable cars and we've never heard much to contradict that impression. The 504 is the larger of two lines sold in this country and is a front-engine, rear-drive car. Its engine is also a pushrod inline 4-cyl unit. It's the only one in the group to have independent rear suspension, but then this is a feature more essential to a rear-drive car than to a front-drive one. It has disc brakes all-around. The 504 is shorter than the Volvo but even taller and is the second heaviest car in the group. It's the only one to have a sunroof as standard.

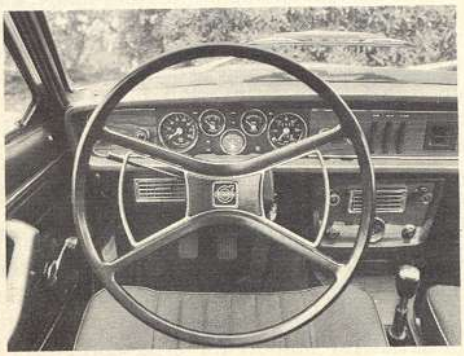
Peugeot also has had carburetion and brake problems. The best explanation we have of the 504's ills is that with its super-lean carburetor jetting it is particularly susceptible to clogging of the jets with dirt. A Peugeot representative tells us that the U.S. distributor now strongly recommends that dealers install an inline fuel filter to remedy this—at the expense of the customer—and it astounds us that this still isn't being done at the factory! The brake trouble was noise, early 504s having a bad case of disc-brake squeal. A new pad material and repositioned rear discs have solved this, says Peugeot, and our test car didn't have an inordinate amount of squeal.

Saab, the "No. 2" Swedish carmaker, isn't a trend-following company and the 99 is a highly individual car. All Saabs have had front-wheel drive, although the power package was rearranged for the 99 from the earlier Saab design that's still used in the Sonett and 95-96. Saab hasn't been an engine builder since dropping the old 2-stroke, and the 99's engine comes from Triumph in England (it will be built by Saab in 1973, however). It's the only overhead-cam design in the group, and despite the smallest displacement of the four it cranks out a healthy 97 bhp—thanks in no small measure to its electronic fuel injection. It has the highest compression ratio of the four, though ➳









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like the rest it runs on low-octane fuel.

The shortest car in the group by 5 in., the 99E has the second-smallest trunk in the group but, overall, the most roomy interior—its combined front and rear legroom is equal to that of the Volvo and Audi and greater than the Peugeot's. It also has the tallest seats, rear headroom equal to the best in the group, and the widest rear seat; its front headroom, however, is 2 in. less than in the leading Audi and Peugeot.

In the chassis department the 99E has all-around disc brakes with a vacuum booster, plus a clever diagonal division of effort between its independent hydraulic brake circuits to assure good braking with partial hydraulic failure. Like the Audi it gets by with a simple beam axle at the rear, though it uses coil springs there in contrast to the Audi's torsion bars. Whereas the Audi has an anti-roll bar at the rear only, presumably to minimize the typical front-drive understeer, the Saab has no a-r bar at either end.

Volvos are big sellers in the U.S.—they're going at the rate of over 40,000 per year now—and their success is built upon claims of durability and reliability. These attributes they have generally had, but there were some years—notably 1968 and 1969—when their production quality slipped so badly as to tarnish the reputation. Things seem to be sorted out now. Our test car was the 144E, the 4-door 140 with electronic fuel injection; it is the heaviest car in the group as well as the longest and has the largest trunk by a good margin. Surprisingly, though, its interior dimensions aren't the most generous.

The 140 series has been around since 1966. It now uses a 2-liter version of the faithful Volvo B engine, another pushrod inline 4, and for markets west of the Mississippi only the E versions, with Bosch electronic fuel injection like the Saab's, are sold while the carbureted S versions are also available elsewhere in the U.S. Besides the automatic option, 140 buyers have the option of an overdrive 5th gear, the only one in the group. The Volvo sedans have disc brakes at all four wheels with an unusual and effective reserve braking circuit, different from the Saab's; rear suspension is by a live axle on links and coil springs.

The Test

FOR THIS comparison test we first pressed the four sedans into daily use for a week, installing the usual R&T logbook in each car's glovebox for drivers' comments. Then, following our usual comparison-test procedure, we mapped out a 150-mi trip that would put the sedans through the kind of use they normally get: some 2-lane country road motoring, but considerably more freeway and stop-go urban traffic use. The cars went in convoy, and drivers switched cars according to a plan that would give each driver a period of driving covering each type of use described above. At each stop the drivers recorded their comments and scored the cars in 18 areas of performance, handling, ride, braking, comfort and assembly quality. At the end of the day's driving all the drivers assembled to tally their scores and discuss their findings. Finally, all the cars were taken to Orange County International Raceway near our home base in coastal southern California for the objective performance, handling, braking and noise tests. Here are the results.

Comfort, Controls, Accommodation & Vision

ALL OF these sedans have good front seats—individual seats for two people only, with carefully designed contours and adjustable backrest angle. The Saab also has a seat warmer for the driver and the Volvo has that company's unique lumbar-support adjustment that varies support at the bottom of the backrest. We found the Audi's and Saab's seats the best, though the Audi's wrapped-around backrests (which provide good lateral support for brisk cornering) cause some drivers to feel confined. The Audi has by far the lengthiest fore-aft adjustment and ties with the Peugeot for greatest headroom (the latter gets a boost from its indented sunroof). But the Volvo, with its 6-window body, gives its driver the best outward vision by a small margin over the others.

PERFORMANCE

	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Lb/bhp (test weight)	31.2	34.8	29.7	27.6
Standing ¼ mi, sec	19.5*	20.4	18.4	20.0
Speed at ¼ mi, mph	69*	66	72	69
0-60 mph, sec	13.7*	15.9	12.7	14.5
Brake fade, % increase in pedal effort in six 0.5g stops	55	4	nil	52
Stopping distance from 80 mph, ft	296	339	296	292
Control in panic stop	good	fair	excellent	good
Overall brake rating	very good	good	excellent	very good
Cornering capability, g	0.652	0.652	0.662	0.632
Fuel economy, mpg (trip)	20.0*	20.0	22.0	19.5

*with automatic transmission

The Saab, however, scored best overall on its interior. Its seats are the highest off the floor, which cuts front headroom but still leaves rear headroom equal to the Volvo's for best-in-group, and though relatively soft they're firm enough to provide good support in the important places. The Saab's rear seat is the widest, and by a small increment over the Volvo and Peugeot it's the easiest to climb into and out of. We found its materials and styling inside the best in the group; the seat upholstery is a soft fabric that may not have the durability of vinyl but is cooler in the summer and warmer in the winter as well as distinctly luxurious in feel; door panels are a most attractive vinyl. The 99E's instrumentation and controls also got the top rating; dials are readable, well lighted at night and, except for some vague symbol language in the minor instrument cluster, well designed. So are the controls, which include two column stalks for dim-bright, wiper-washer, directionals and a daytime headlight flasher.

For rear seating room the Saab and Volvo are essentially equal, the nod going to the Volvo for its fold-down rear armrest or the Saab for its extra inch of seat width. The Peugeot's front seats are the widest.

It seems to us that all four cars have adequate trunk capacity for their passenger space, but for those to whom this is a critical factor, the Volvo wins by over 2 cu ft at a huge 15.6 cu ft. There's a high lip over which stuff must be loaded into its trunk, but every car in this group shares this detraction to some degree or another, and the Volvo's spare-tire location is the best because it can be removed without unloading everything from the trunk.

At highway speeds the Volvo is the quietest, slightly better than the Saab and Peugeot despite an air leak around one ventwing. Both the Volvo and Peugeot's engines seem relaxed at road speed, though the Peugeot's develops a mild boom from about 75 mph upward. The Audi is the noisiest; its engine is quite audible and its wind-noise level is on the high side too.

The state-of-the-art in car ventilation has improved a lot in recent years. Two of these sedans are up to it, two are not. We rated the Peugeot's and Saab's ventilation provisions equal, but there are important points of difference. The Peugeot puts through the most air if its blower is used and a window is at least cracked; this comes through a dash-top vent, parts of which are pulled up to control the air direction. But it's not possible to direct all the air toward one side of the car or the other, which can be a critical matter on a hot, sunny day. The Saab's delivers somewhat less air but doesn't need a window open to aid its flow-through system, and the air can be directed entirely at a lonely, overheated driver if he wants it.

One car in the group is seriously behind the others in ventilation, controls and instrumentation: the Volvo. There are no face-level vents in the dash, there's that ribbon speedometer

COMPARATIVE STANDARD FEATURES

Feature	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Disc brakes	front	4-wheel	4-wheel	4-wheel
Vacuum brake assist	no	yes	yes	yes
Radial tires	yes	yes	yes	yes
All-independent suspension	no	yes	no	no
Automatic choke or enrichment	yes	no	yes	yes
Tinted glass	no	no	yes	yes
Heated rear window	yes	no	yes	yes
Adj. front seatbacks	yes	yes	yes	yes
Folding rear armrest	no	yes	no	yes
Clock	yes	yes	yes	no
Sun roof	no	yes	no	no
Energy-absorbing bumpers (1972)	no	no	yes	no

we've never liked, and the radio is two-thirds of the way across the panel from the driver, a real reach. But soon after this is published the 1973 version, with its revised panel, instruments and ventilation, will be available. A photo of this will be found in the "Ampersand" section. Our test car had Volvo's dealer-installed Rallye instrumentation, a set of small round white-on-black gauges, but since this is not a factory option we rated the standard arrangement in our comparisons.

Contributing to a feeling of comfort and security on a psychological basis is a solid, rattlefree body. Here the Saab was the most impressive: despite its moderate weight it has the solidity of a small tank. Not far behind is the Volvo, and the Audi would have been the Volvo's equal but for some underbody rattles.

Performance, Economy & Drivetrain

THERE ARE two distinct levels here: the Audi and Saab, and the Peugeot and Volvo. It was not possible to get a manual-transmission Audi at the time of our test (about 70% of the Audis sold in the U.S. have the automatic) so we had to pit an automatic car against three manually shifted ones. No matter; the automatic Audi is highly responsive and comes so close to matching the quickest of the lot—the Saab—that it's certain the manual version would equal it.

The Peugeot and Volvo with manual transmission are sickly, to be blunt, and we'd advise anyone interested in an automatic version of either to try it first; it may be downright unacceptable. These two have lower compression ratios than before—the Volvo, like the Audi, tumbled from over 10:1 to its present level, and despite its impressive on-paper ratio of power to weight it's sluggish—especially in its low-speed response. Peugeot has had to go all the way down to 7.5:1, and though no power decline is admitted by Peugeot, there definitely has been one. Our 1971 2-liter 504 would equal the present Volvo in 0-60 time, but the 1972 won't. There seems to be confusion at Peugeot on the power rating anyway; last year the net power rating was 87 bhp and the gross 98; now they say a net rating of 92 bhp but we'll bet they mean gross.

The earlier 1760-cc Audi engine was a real noisemaker, but today's manually shifted 1875-cc Audi 100 is noticeably quieter. The automatic version, like many automatic versions, is so much noisier than the manual that it's right back where it started, so to speak. Consequently the Audi engine rated as noisiest in the group by a clearly discernible increment, even though its peak noise reading at redline was no higher than for the otherwise calm Saab engine. The Peugeot's power unit is tranquil unless driven very hard, and so is the Volvo's, and perhaps in this case the noise readings at 70 mph give a better indication of the engines' general noise level than the peak readings do.

In fuel economy, once again it's a contest between the Audi and the Saab. The Saab, whose compression ratio is still relatively high, was the winner with 22.0 mpg, and the Audi engine must still be pretty efficient to have done an even 20 with automatic. The Volvo and Peugeot are close together and about 2 mpg lower; remember, they are heavier.

Driveability is a big subject these days, what with lean mixtures, retarded spark and sparse choke action the order of the day to get low emissions. We've already mentioned the early problems of the Audi and Peugeot carburetors. Our test Audi still showed traces of the problem: when cold the engine stumbled badly upon acceleration, and even when fully warm it didn't respond eagerly to a little extra accelerator foot. The Peugeot had nothing more than a little surge at medium speeds in 4th gear, but then it had had its fuel filter installed.

But the two fuel-injection cars should be clean, right? Right, but not quite. The Volvo was. It started quickly on its automatic enrichment, though a few times it did die once like most carburetor engines do. After that, though, it was smooth running straight through to fully warmed up. The Saab, however, would stall occasionally while driving during its warmup period although it ran very well when warm. One exception: with this fuel injection system the fuel supply is shut off on deceleration but comes back on when the engine gets down to something like 1500 rpm. When this happened the Saab engine would jerk its powertrain sharply.

Of the three stick-shift cars, the Peugeot had the best gearbox. Not that there were problems or even criticisms with the gearboxes themselves, but there were notable differences in the shift mechanisms. The Saab got lowest marks. Its gearbox is ahead of the engine and the linkage has to go a long way to get back to the passenger compartment; it is a bit vague and sticky, and because our test car was a relatively low-mileage one this was probably at its worst. The Peugeot was our first 504 with floor shift and we must say it's an improvement over the traditional Peugeot column lever; we rated it the best, as we said, because it took less effort to shift than the very stiff-shifting Volvo and was equally precise. Our recollection of the Audi mechanism is that it's quite satisfactory—better than the Saab's, probably because its gearbox is behind the engine—and about as good, on balance, as the Peugeot's.

Ride, Handling & Braking

NOW WE'VE sat in them and accelerated them. What about flinging them around corners and charging down rough roads with them?

To answer the first question, none of the four sedans is really meant to be flung about. They're mostly good-handling cars and all have good road stability, mind you, but not a one makes any pretense at being a sports sedan.

We rated the Peugeot best in the ride department, no surprise as this is so often a strong point with French cars. It has gobs of suspension travel; Peugeot has long experience at tuning suspension to radial tires and Michelin the longest experience at making radials as smooth as possible. Never mind the road surface with the Peugeot: just keep going, as fast as you like. The Saab came in second. On normal road surfaces its harshness is low, and a road full of bumps and humps doesn't upset it. It does have a problem, however: coming out of a dip its front end may well leave the road briefly. There seems to be an overabundance of damping in the rebound direction of its front suspension movement. This also manifests itself as a tendency for the inside wheel to hop and lose traction even on slight irregularities when cornering.

The Audi rides very well generally, and overall we rated the test car's ride equal to the Saab's. But the Audi too had a problem, and in the case of the test car it was a bad one. On light braking, or on a wavy highway surface that often generates what we call "freeway hop," a terrific shake of the entire power unit up front would get going. Slight misalignment of a brake disc was probably responsible for setting off this shake on the light braking, but there was no such excuse we know of in the freeway situation. An ex-staff member who owns a current 100 drove the car briefly and told us that his car has a slight case of this shake but nothing like our test car; we gather that the slight degree is normal. Otherwise the Audi's ride was impressive; it takes dips with aplomb and the ride over most kinds of bumps and non-regular undulations is well damped but pleasingly firm.

→

FOUR FAMILY SEDANS

WARRANTY & MAINTENANCE

	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Service intervals, mi:				
Oil change	6000	3000	6000	6000
Filter change	6000	6000	6000	6000
Chassis lubrication	none	3000	none	none
Drivetrain lubrication	18,000	6000	12,000	24,000
Valve adjustment	6000	12,000	18,000	12,000
Engine tuneup	6000	6000	6000	6000
Warranty period, mo/mi	24/24,00	12/unltd.	12/unltd	6/unltd

The Volvo's ride is the least satisfactory overall. Basically it's a harder ride, but at least it's without the upsetting problem of the particular Audi we tested.

Our handling comments always cover both subjective and objective data, and in this case the two diverge more than usually. Our four drivers on the test trip rated the Peugeot best, followed in order by the Audi, Volvo and Saab. The Peugeot on the road feels responsive; its steering is fairly light and quick, and the all-independent suspension keeps it in good shape on rough surfaces, though as with the Volvo, its body rolls a bunch. The Audi understeers impressively little for a front-drive car, its steering is quite light, and there's little of the so-called "fwd effect" in which the steering tightens when power is applied in a corner. The Saab, on the other hand, has relatively stiff steering that gets considerably stiffer when there's power being applied. And finally there's the Volvo, which seems clumsy in any kind of cornering maneuver with gobs of body roll.

But get the four on a smooth skidpad and other answers come up. The Saab, on its Michelin ZX tires, got around the fastest even though its front ones were scrubbing merrily away. The Audi scrabbled and screeched around but tied for second-best time with the Peugeot, once again revealing that it could be sent into oversteer fairly easily by lifting the throttle foot. At least the Volvo approached its road impressions by coming in last, and it's interesting that the current Volvo 140 series, like most Volvo sedans of the past, oversteers even in the steady-state condition of a smooth skidpad. All you need to do to get its tail out is to tweak the steering wheel.

For everyday use all four cars have good brakes, and in our comparison drive the drivers rated the four sedans essentially equal. But braking data is primarily objective: how far does it take to stop in an emergency, and how well do the brakes resist fade in repeated vigorous applications? In the emergency stop three of the cars—the Audi, Peugeot and Volvo—are virtually equal; a 4-ft difference in stopping distance from 80 mph cannot be measured repeatedly with any certainty. But the Peugeot, whose rear wheels locked too readily in "panic" stopping, took much farther to get stopped: 339 ft.

Our brake fade results were almost predictable—almost. Two of the cars with all-disc brakes showed next to no fade in our 6-stop test and the one with a disc-drum combination, the Audi, took about a half more pedal effort to stop on the sixth stop than on the first. But the other all-disc car, the Volvo, showed as much fade as the Audi. In summary, one car—the Saab—has the best brakes in the group, with no fade in the fade test, the best directional control in the panic stop and a stopping distance as good as the best in the group.

Fully Loaded

IT OCCURRED to us, as we experienced the leisurely performance of the Volvo and Peugeot and contemplated their roominess, to wonder how they'd perform when loaded to their makers' maximum allowable weight. So we ran some extra acceleration tests with full load. Here are those results, which may be critical to those who load cars heavily:

INTERIOR NOISE, dBA

	Audi 100 LS	Peugeot 504	Saab 99E	Volvo 144E
Maximum, 1st gear	82	78	82	78
Constant 70 mph	78	76	75	74

	Audi	Peugeot	Saab	Volvo
Maximum weight, lb	3550	3760	3510	3800
0-60 mph time, sec	17.1	19.8	15.9	18.1

Defects

THIS BATCH of cars, contrary to the "quality" image we and most of their customers expect of them, had their share of defects, either apparent at the time we picked them up or developing while we had them. They were:

Audi: rattling exhaust heat shields; rattling seatbelt mechanisms; stoplights that stuck "on"

Peugeot: carpeting poorly cut and installed; inoperative door lock

Saab: sticky door latches; inoperative clock; inoperative interior lights

Volvo: wind leak around left ventwing; inoperative headlights

Summary of Results

THE AUDI was our overall winner, by a small margin over the Saab. In making their ratings our drivers attempted to imagine the Audi as a manually shifted car and compare it fairly with the other three on this basis—all of them personally prefer manual shifting. Three of our four drivers rated the Audi best; one gave the Saab the nod. The Saab was rated second by three, the Peugeot by one. The Peugeot got three thirds, the Audi one. And the Volvo was fourth choice unanimously.

In our various subjective categories, the Audi got "firsts" in steering, driving position, styling and overall quality of assembly. The Saab garnered seven such firsts: engine, instrumentation-controls, body structure, ingress-egress, rear seating (a tie with the Volvo, as mentioned earlier), interior styling-materials and ventilation. It was also ranked first in braking; that's a combination subjective-objective rating. The Peugeot got that subjective "first" in handling as well as ride, general noise level, gearbox and ventilation (a tie with the Saab). Volvo, other than the tie with Saab on rear seating, got only one clear first: in trunk space.

What about the other side, the "worsts"? The Volvo got five: ride, engine, instrumentation-controls, driving position and ventilation. So did the Peugeot, in braking (but bear in mind the Audi's wear problem), body structure, interior materials, exterior styling, and trunk space. The second-overall Saab looked worst in four areas: subjectively, handling; steering, gearbox and outward vision. Finally, the Audi got three worsts—noise level, ingress-egress and rear seating.

LET US recap all this so our conclusions will be perfectly clear. We liked the Audi best; but remember that its superior styling played a part in that rating. Taking that out of the ratings would have given it and the Saab virtually equal scores. From this it hardly needs saying that, styling aside, the Saab is the Audi's equal and is a very competent car indeed.

Then we move down to the Peugeot. One of our testers said that if it had a better engine he'd have rated it first. But as it stands it has a severe handicap—it just needs more power. The Volvo seems terribly old-fashioned now—not that it was very modern when it was introduced. Subjectively, as we mentioned, it's a clumsy car. Its great reluctance to get going from a stoplight adds to that impression. At least for 1973 its instrumentation, controls and ventilation will be improved.

So there you are—four roomy, economical-to-run family sedans, two nearly equal, one a cut below, one two cuts below. Now you know what we think; take your choice.