

THE VOLVO 960: IT SHOUTS INCONSPICUOUS CONSUMPTION

As the nineties unfold, a different world with new values is emerging. In place of opulence, today's automobile customers seek comfort and security. The raw power expected of engines in the past has been tempered by concerns for fuel efficiency and low emissions. Unchanged in this set of customer values is the demand for quality. Volvo with its long history of producing high quality automobiles has shown itself more than able to address these stringent requirements. Enter the Volvo 960.

From the outside the 960 sedan shares the more fluid lines Volvo introduced on its 940 series in 1991. The distinguishing features of the 960 lie under its characteristically Volvo skin. Most outstanding are its all-new drivetrain and its Side Impact Protection System.

The inline six-cylinder engine which powers the 960 is the first in a new family of lightweight aluminum alloy engines designed and built by Volvo. The extensive use of aluminum and finite element design techniques have resulted in a very compact engine which is both strong and light. The cylinder head has four valves per cylinder for increased efficiency. They are operated by belt driven double overhead camshafts via hydraulic tappets which require no adjustments. A great deal of attention has been paid to the smooth flow of gases into and out of the engine. Both intake and exhaust manifolds have long individual runners for high torque at relatively low rpm.

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A quick look under the hood of the 960 reveals a clean engine compartment with an amazingly small engine! The new inline six is only four inches longer than Volvo's proven four-cylinder engines. Absent from the engine is the conventional distributor, which has been replaced by individual ignition coils which sit immediately atop each of the six spark plugs. A Bosch Motronic 1.8 engine management system handles both the ignition timing and fuel injection functions. The Motronic system also includes a self diagnostic function for easy maintenance. This sophisticated engine management system, along with the new combustion chamber shape, permit this high output engine to operate without the need for premium unleaded fuel. EPA fuel economy figures are impressive at 18 mpg city and 26 mpg highway. No gas guzzlers here.

The principal attributes of inline six-cylinder engines are their inherent balance and smoothness. The B6304F engine delivers these qualities and a great deal of performance as well. Rated at 201 hp at 6,000 rpm, the engine delivers over 1 hp per cubic inch of displacement. A decade ago, this type of output was considered amazing. A medium size engine at 2.9 liters or 178 cubic inches, it delivers a very pleasant combination of performance and fuel economy. In most driving circumstances, it is really torque that makes a car feel responsive. With 197 lb. ft. of torque available at 4,300 rpm, and 80% of that available from 1,000 rpm, the driving experience is very lively indeed.

To efficiently deliver the engine's output, Volvo has developed a new four-speed electronically controlled automatic transmission. The driver can select from three driving modes: economy, sport, or winter. In the economy mode, upshifts are gentle and executed at relatively low engine speeds for best fuel economy. Switching to sport mode allows the engine to rev higher before shifting for increased performance.

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The winter mode will lock out first and second gear so that starting off in low traction conditions, like ice and snow can be accomplished with minimal wheel spin. The 960 also features an automatic locking differential which further assists starting traction in slippery driving conditions.

Another unique feature of this transmission is the 'down slope mode' which senses when the car is descending a hill and automatically engages a lower gear to provide engine braking. This feature is typical of the attention to details that Volvo engineers are famous for.

Safety is always among the primary concerns in the design of a Volvo, and the 960 is no exception. Almost everyone knows about Volvo's front and rear crumple zones and safety cage design. Through their accident investigation work in Sweden, Volvo engineers determined the next important area for safety development was side impacts, which account for about one out of every five collisions. The problem here is more complex because the space between the occupants and the impact is relatively small.

The solution Volvo developed is called SIPS or Side Impact Protection System. Its concept is to transfer the forces of a side impact across as much of the structure of the car as possible, so that the energy may be absorbed and the occupant area remain largely intact. To accomplish this several of the structural members of the car had to be made even stronger and additional reinforcements added. Virtually none of this is obvious from the surface, but the changes include redesigned and strengthened B-pillars, reinforced door sills and roof rails, and redesigned floor members.

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SIPS is designed to force the impact energy of a crash around the occupants of the car, so that the deformation is transferred from the doors and the B-pillars to the roof, floor, and sills. Volvo designers initially used mathematical modeling to determine the size and location of reinforcements. Laboratory testing of prototypes confirmed the design solutions. SIPS today surpasses by a wide margin the side impact government requirements that will be introduced in the U.S. for model year 1994.

The list of standard safety features on the 960 sedan is a long one including: driver's side air bag, pyrotechnique seat belt pretensioners for both front seats, self adjusting three-point seat belts in all five seating positions, and an integrated child safety booster cushion in the rear arm rest. Dynamic safety features are also numerous: power assisted rack and pinion steering, four-wheel power disc brakes with ABS, and an automatic locking differential are all standard.

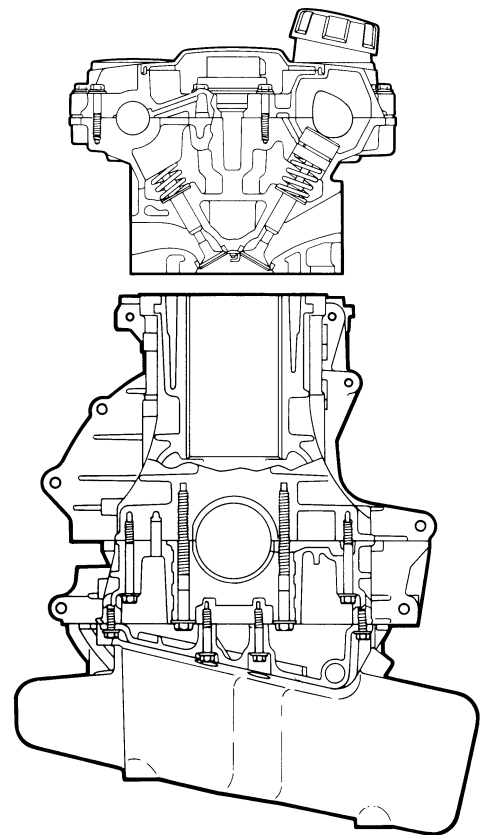
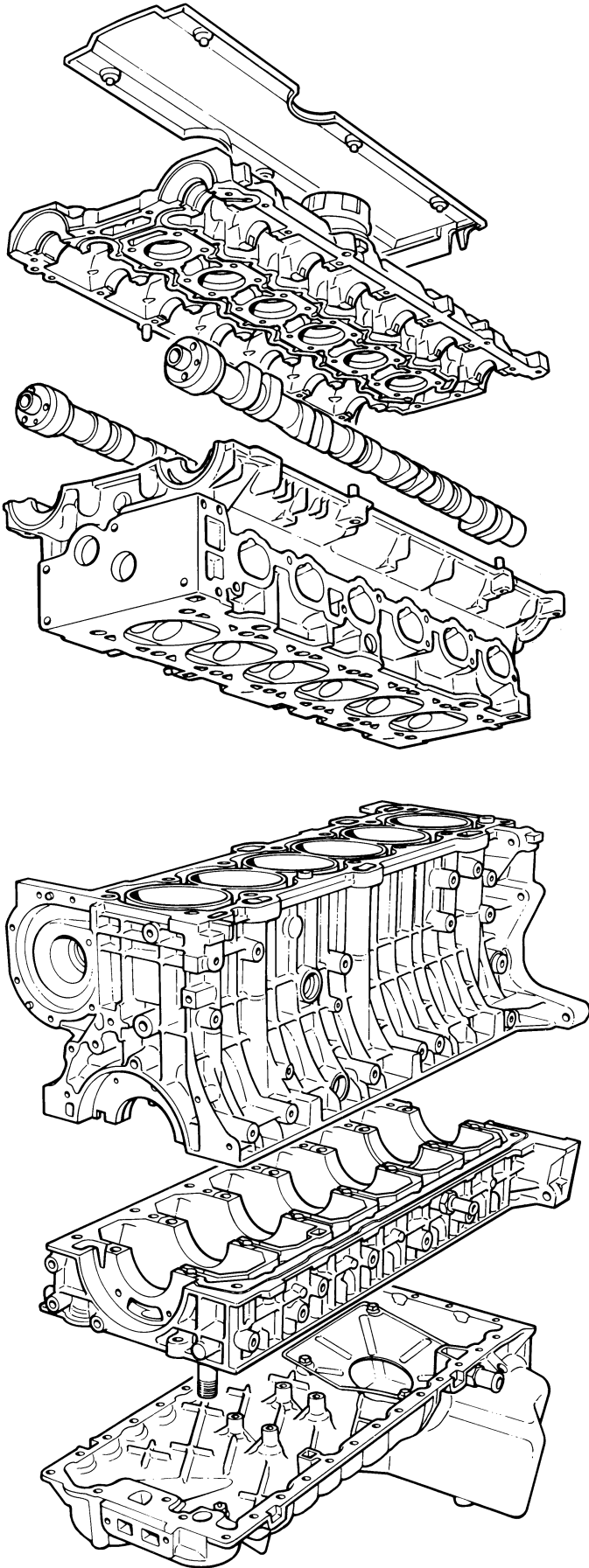
Automobiles in this market segment are known for their creature comforts as well as their performance. The 960 also delivers on this front. Both orthopedically designed front bucket seats are power operated with three memory positions. All seating surfaces are leather. An automatic climate control system regulates cabin temperature, while a six-speaker AM/FM stereo cassette system fills the air with sound. Power-operated features include sunroof, windows, remote mirrors and antenna. For those who need to carry bulky objects from time to time, Volvo offers a wagon version of the 960. This well mannered wagon has all the amenities of the sedan and the extra versatility provided by a wagon.

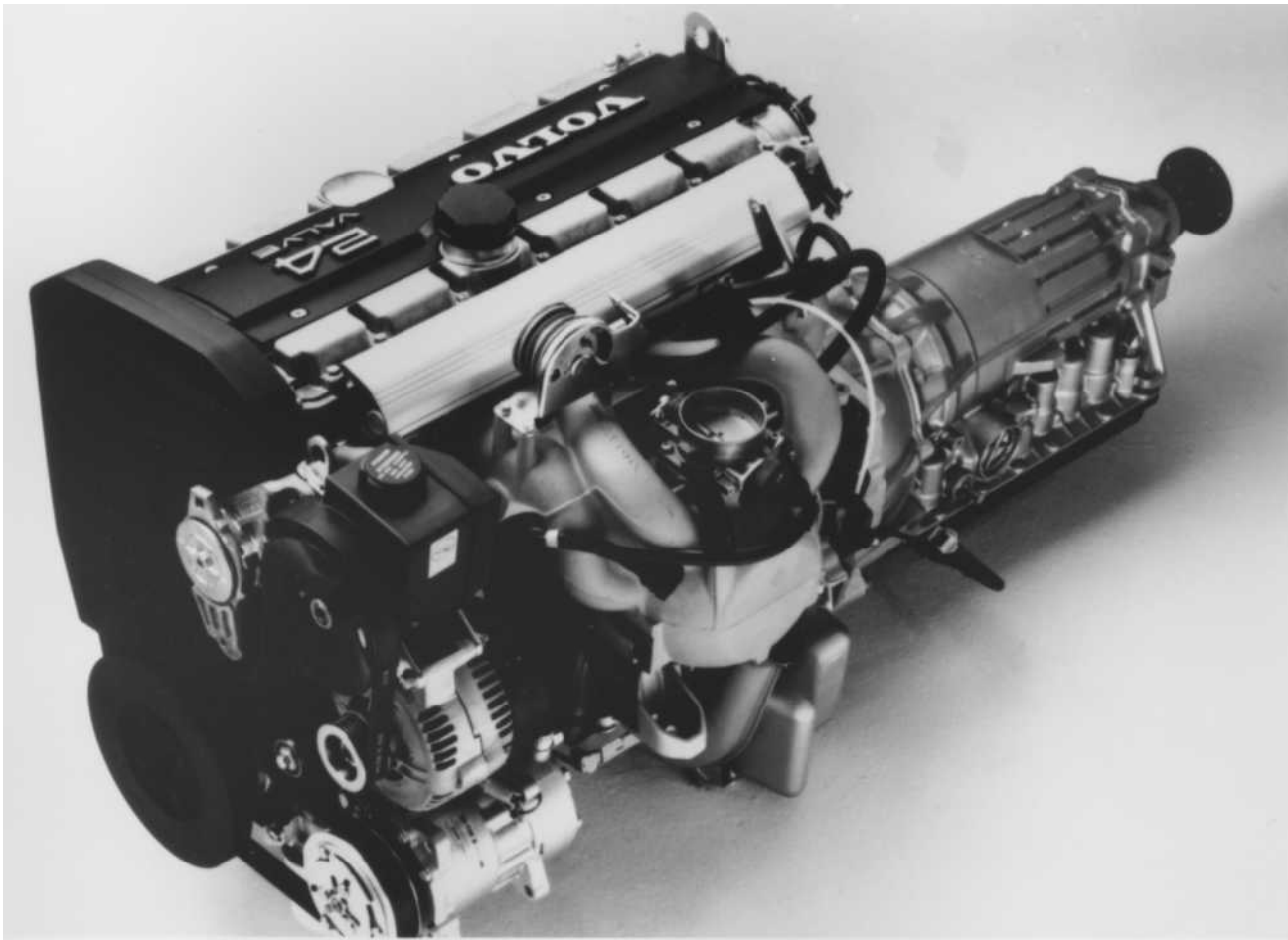
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The Volvo people are justifiably proud of the new 900. It demonstrates their continuing dedication to safety, the sophistication of their drivetrain technology, and their ability to produce a top-of-the-line car that will compete with the best cars from around the world. The 960 is not a car that will announce to your neighbor that you have just won the lottery. What it will do is provide you with a stylish way to transport your family in safety and comfort at a price that says you made a rational choice. Think of it as inconspicuous consumption ... a very satisfying concept in these times.

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Aluminum Alloy
In-Line 6 Cylinder
3 Liter 24 Valve
201 HP at 6000 RPM
197 lb ft at 4300 RPM








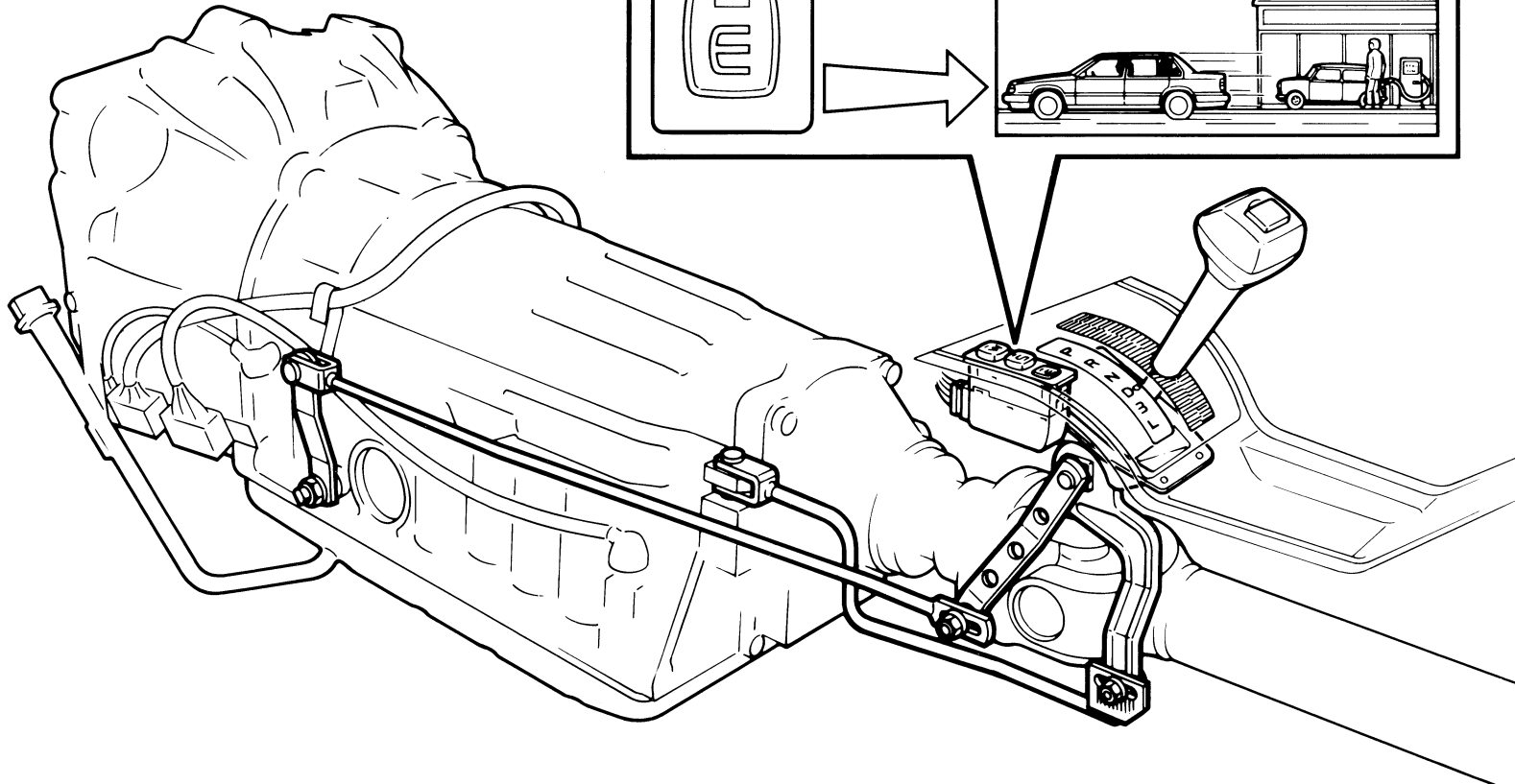
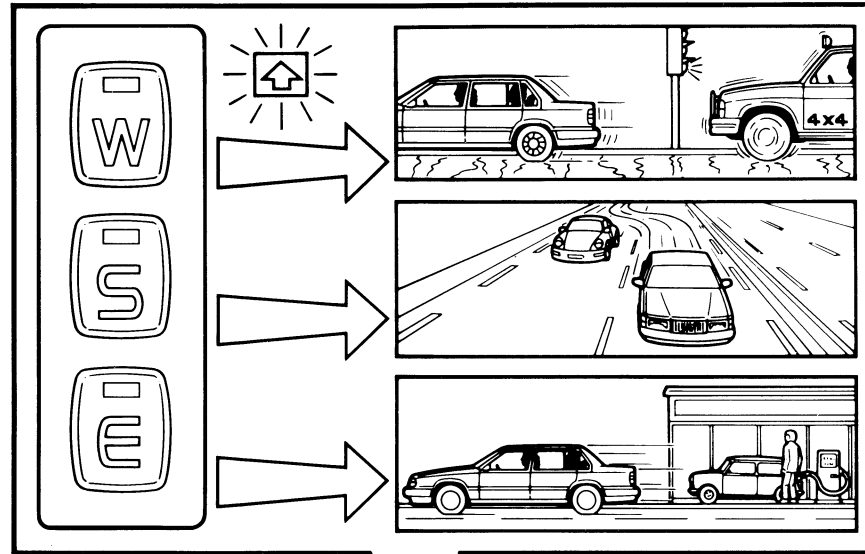
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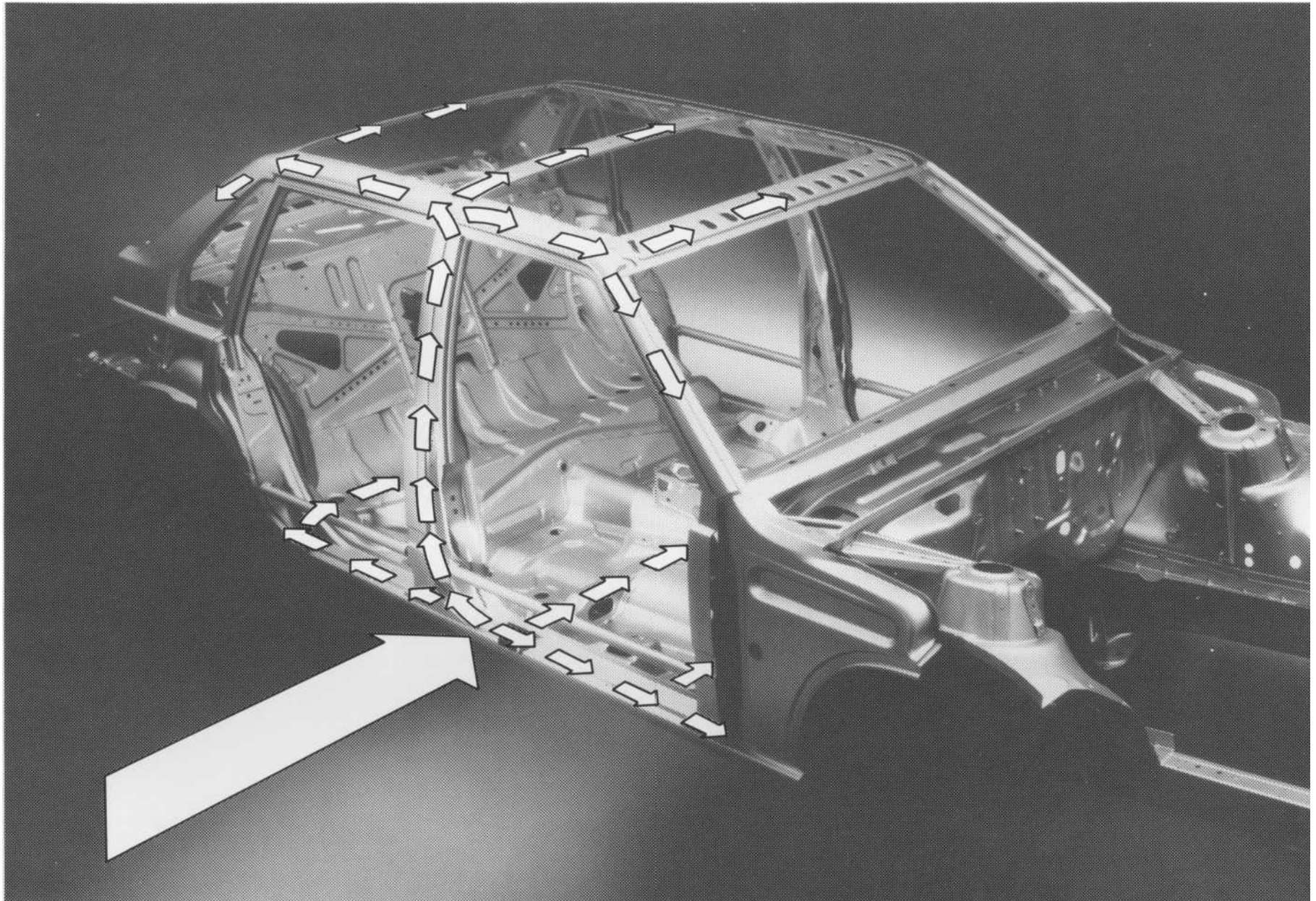
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3 Liter 24 Valve
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AW40

Driving modes

-  **Winter**
-  **Sport**
-  **Economy**





VOLVO SIPS: SIDE IMPACT PROTECTION SYSTEM