Bumper Cars from Volvo

By Stuart Bladon

Huge energy-absorbing bumpers identify all models of 144 and 164 Volvos for 1974. Additional safety features including relocation of fuel tank. Bosch Jetronic fuel injection adopted for 144GL and 145E Estate car, offering a small power increase

NEW FOR 1974 —MORE SAFETY AND BETTER FUEL INJECTION

AS PREDICTED in last week's Road Test of the Volvo 164E, massive front and rear bumpers feature on all models from Volvo in 1974. Although the sight of huge energy-absorbing bumpers has become more familiar in recent years as an essential item of all safety car projects, this is the first time they have been seen on a production car; and it may take a while for this initially ugly though functional item to be accepted in the styling of the new cars. Other changes are also concentrated on the safety aspect, and the 144 is also given the new Bosch K-Jetronic fuel injection system.

At both ends, the bumpers are rubber-faced and mounted on big energy-absorbing mountings. The 164 still has the side and indicator lamps mounted on top of the bumper, yet the cars are claimed to absorb at either end the impact of collision at a speed of 5 kph (3.1 mph) without damage. The front bumper stands about two inches clear of the apron, but the gap between bumper and body is filled in at the rear by extension of the rubber moulding. Without this, road dirt would tend to be thrown back against the bodywork. These collision-bumpers should also help to reduce damage — at least to the car wearing them — in impacts at higher speeds; but they add some 5in. to the overall length of both cars. This takes them over the important 15ft 6in limit, which will mean another £3-£5 each way on cross-channel shipping costs.

Rigidity has been further improved by welding the window frames to the doors, claimed to give added strength in a roll-over. The side-aspect of the cars, as well as visibility on the front quarters, has been improved by deletion of the front quarter vents, which should also reduce wind noise.

Again in the interests of safety, the fuel tank has been moved forward to a position just behind the back axle. Although it might be feared that this will mean reducing its size, it is in fact slightly bigger than before, now holding 60 instead of 58 litres (13.2 gal). The tank also includes an expansion tank of just over 1 gal capacity, and the filler is now concealed behind a front-hinged flap.

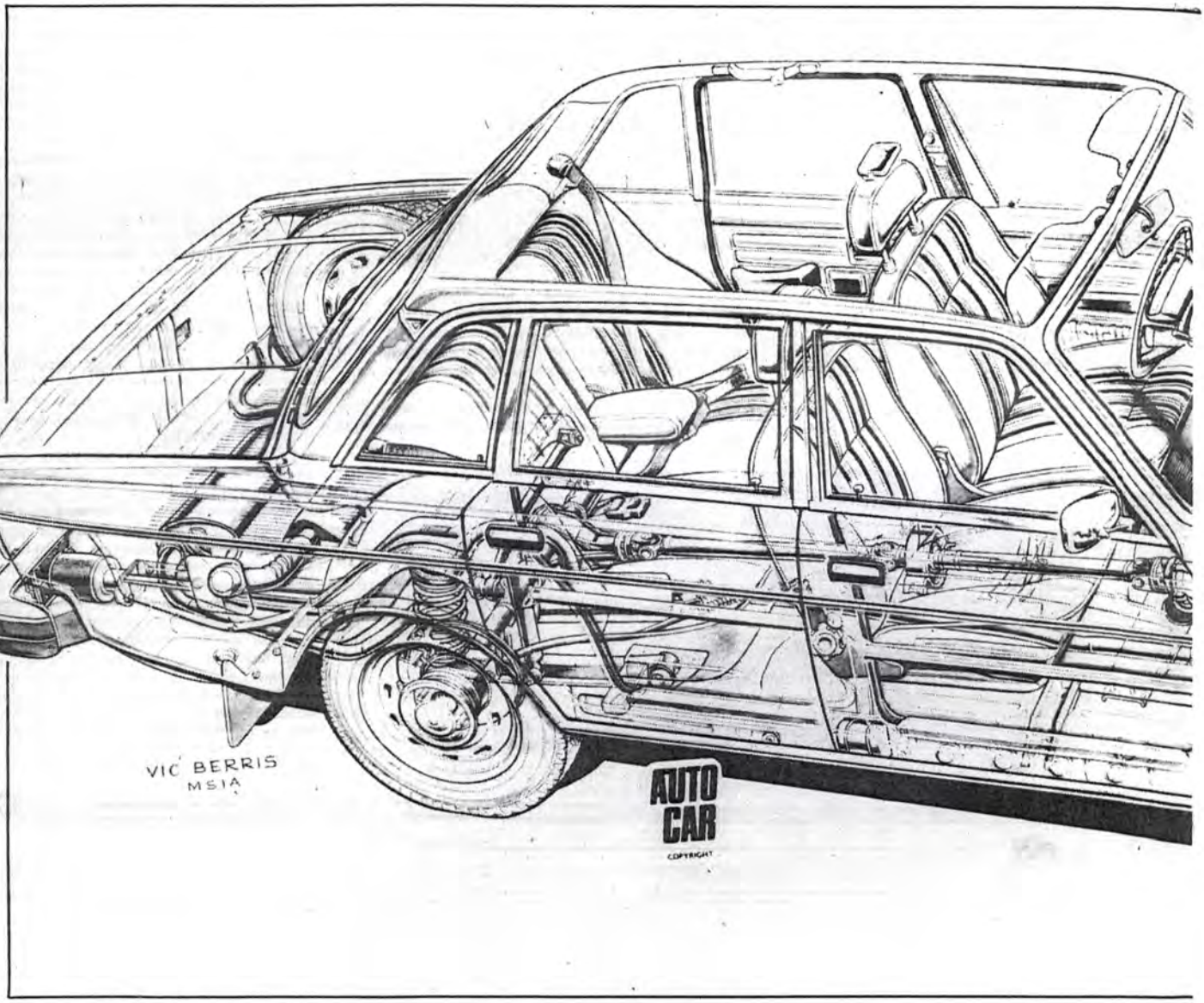
Seating has been improved, and the idea of electric seat heating, previously an option for countries exposed to very cold weather, now becomes standard for the driving seat of the 144GL and 164. The heating element is thermostatically controlled to come on with the ignition once the temperature drops to 14 deg C (57 deg F). It is claimed to heat up from freezing point to 26 deg C (78 deg F) in three minutes, and at this temperature it automatically cuts out. The seat adjustment mechanism now picks up on both runners for extra safety in a collision — Volvo say ECE requirements for seats to withstand a force of 120 lb are easily met. To and fro seat adjustment is now by raising a full-width bar at the front of the seat, and for backrest angle there is a much more convenient rotary adjusting hand wheel at the base of the squab. Longitudinally striped flame-resistant

Above: Hard rubber mountings are used for the bumpers, and the front bumper stands well clear of the bodywork.

Below: Flame resistant cloth upholstery is now used for the seats, except in the 144GL and 164E, which still have leather. Deletion of the front quarter vents improves visibility and reduces wind noise. The window frames are welded to the doors for additional strength.

PRICE TABLE

Model	Basic Price £	Total Price £
144 De Luxe (Single carb.)	1,842	**2,195.05**
Automatic	1,993	**2,374.98**
144E De Luxe (Injection)	2,090	**2,490.57**
144GL (Injection, overdrive, sun-roof)	2,392	**2,850.46**
Automatic	2,467	**2,939.83**
145 Estate Car	2,123	**2,529.90**
Automatic	2,257	**2,689.58**
135E Estate Car (Injection)	2,400	**2,860.00**
Automatic	2,576	**3,069.72**
164E (Electronic injection, overdrive, power steering, sun-roof)	2,895	**3,449.87**
Automatic	2,971	**3,540.43**
164TE (As 164E automatic plus air conditioning, cartridge player and headlamp wipers)	3,373	**4,019.48**



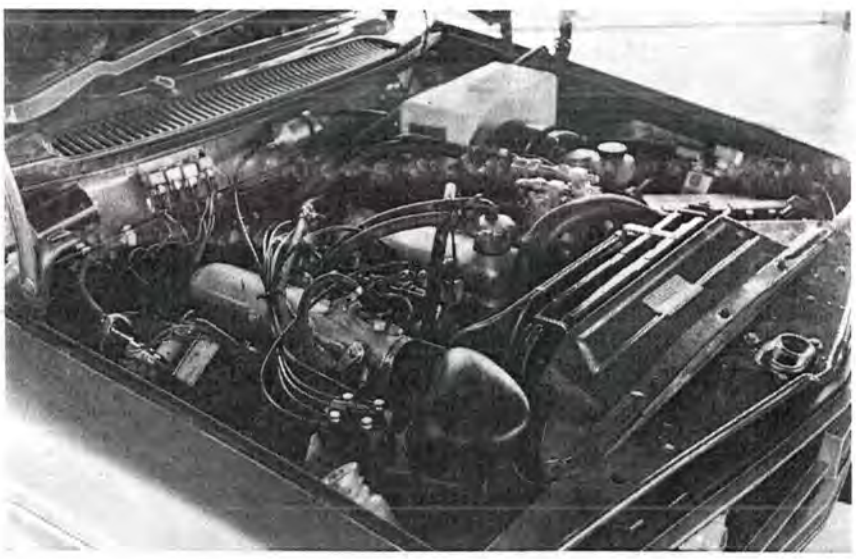
material is used for the cloth seat upholstery except in the 144GL and 164E, which retain leather upholstery.

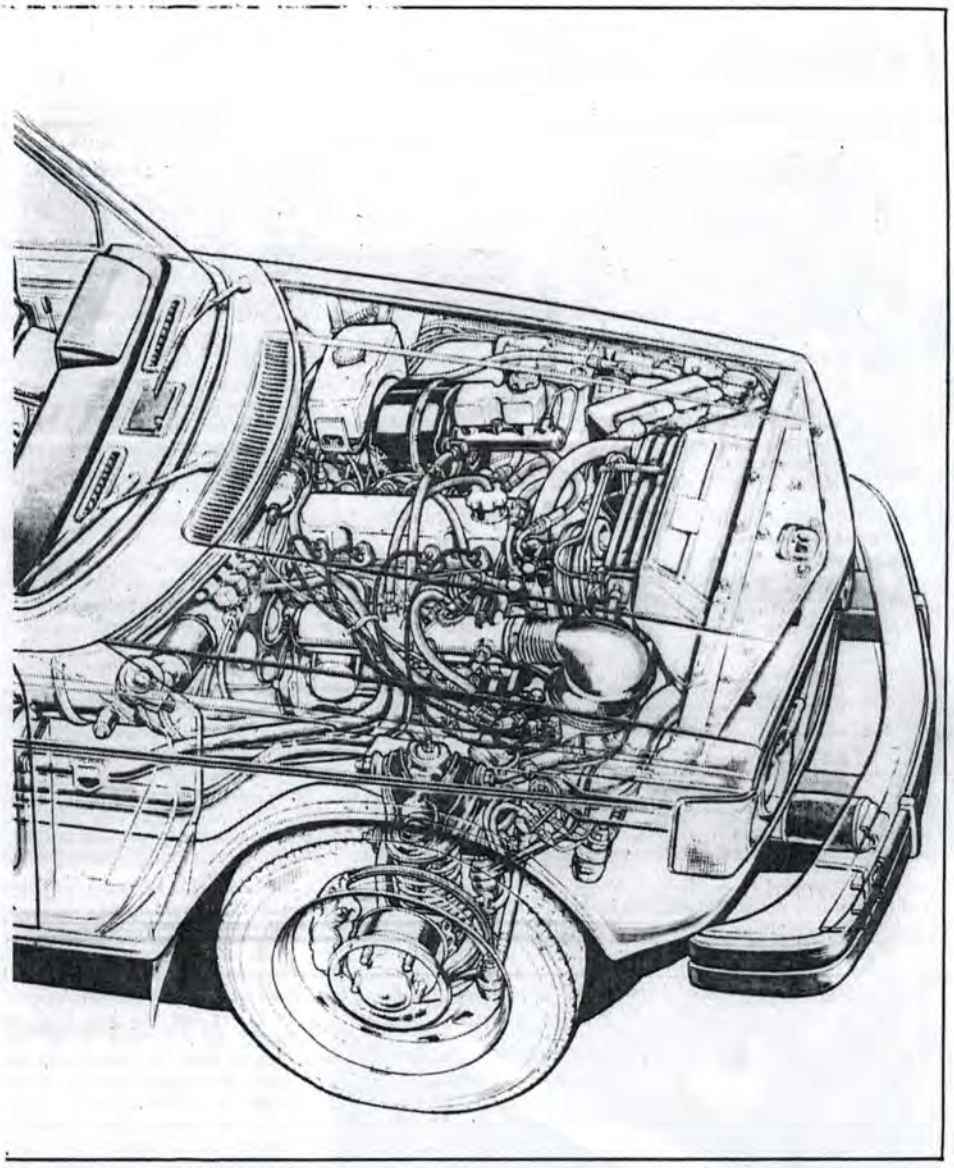
Previous Volvos had overlap couplings to prevent intrusion of the steering column in event of an accident. These are retained, but in addition the centre part of the column now incorporates an energy absorbing zone surrounded by a corrugated "bellows", to absorb the weight of the driver's body progressively if he is flung forward on to the wheel in an accident. Facias are largely unchanged, but incorporate a warning tell-tale which comes on if any bulb in the dipped headlamps, tail or stop lamps fail to function. Halogen headlamps are available with wipers to clean their glasses.

The carburettor version of the 164 is discontinued, but a new top model called the 164TE is introduced having automatic transmission, refrigeration, headlamp wipers and a cartridge player, but as the price is over £4,019.48 this seems expensive. Even after allowing for the cost of refrigeration, the cartridge player is running out at some £200.

In other respects, the Volvo 144 and 164 series continue as before except for the change of fuel injection on the 144 mentioned earlier; the 164E retains the Bosch electronic injection.

Bosch K-Jetronic constant flow fuel injection is standardized on the 144GL and the 145E Estate car. The single carburettor 144 De Luxe continues in production





New colours for 1974 are dark red and dark yellow.

New Injection for the 144

A full description of the new Bosch fuel injection, by our German correspondent Olaf Fersen, was published in the 16 August 1973 issue of *Autocar,* and it is only intended to give here a summary of its operation. The chief difference from former injection systems is that the fuel spray is continuous all the time the engine is running; the injection sprays into the air inlet stream behind the inlet valve.

Fuel is delivered by electric pump under pressure to the engine, and the system remains pressurized even when the engine is switched off. The driver's throttle control adjusts the position of a butterfly valve in the air stream in the usual way, and the air then passes through a conical opening obstructed by a disc. The more the driver opens the throttle, the more air is admitted, and the flow pushes this air flap progressively farther out of the way, in proportion with engine speed as well. The movement of the disc (which simply measures air flow into the engine) is linked by a pivoted arm to four fuel meters. Again, the more the air flow, the higher the pistons in the metering cylinders are moved, exposing an increasing area of their escape valves through which petrol can pass to the engine.

There are the usual provisions for automatic enrichment of the mixture for cold starting, acceleration and high speed running. Cold starting enrichment is achieved by an additional injector, controlled by a bi-metallic spring, and once the engine has started the bi-metallic spring is heated electrically to reduce and finally cut off the rich mixture at the same rate as the progressively warming engine requires.

This new injection system is claimed to give very accurate metering of the fuel supply to the engine, thus reducing exhaust emissions, and because the system remains under pressure while the engine is at rest, it should give easier starting, especially when the engine is still hot — often a problem with some injection systems. It features on the 144GL and the 145E Estate car, and gives 4 bhp more than the Bosch system, the new output valve being 124 bhp (DIN) at 6,000 rpm. Torque is unchanged. □

The rear bumper has a rubber section behind the unit to fill in the gap between this and the apron. As the fuel tank is repositioned farther forward, it has been possible to make the rear part of the boot deeper

SPECIFICATION

FRONT ENGINE, REAR-WHEEL DRIVE

ENGINE

Cylinders	4, in line
Main bearings	5
Cooling system	Water; pump, fan and thermostat
Bore	88.9,, (3.50in.)
Stroke	80mm (3.15in.)
Displacement	1,986 c.c. (121 cu. in.)
Valve gear	Overhead; pushrods and rockers
Compression ratio	10.2-to-1. Min. octane rating: 97 RM
Induction	Bosch K-Jetronic fuel injection
Fuel pump	Bosch high pressure
Oil filter	Full flow, throw-away canister
Max. power	124 bhp (DIN) at 6,000 rpm
Max torque	123 lb. ft (DIN) at 3,500 rpm

TRANSMISSION

Clutch	Borg and Beck diaphragm spring
Type	8.5in. dia.
Gearbox	Four-speed all-synchromesh
Gear ratios	Top 1.0; OD top 0.797 Third 1.36 Second 1.99 First 3.41 Reverse 3.25
Final drive	4.10 to 1

CHASSIS and BODY

Construction	Integral with steel body

SUSPENSION

Front	Independent: double wishbones, coil springs, telescopic dampers, anti-roll bar
Rear	Live axle on trailing arms, radius rods, Panhard rod, coil springs, telescopic dampers

STEERING

Type	Gemmer, hourglass cam and roller
Wheel dia.	16.5in.

BRAKES

Make and type	Girling all-disc
Servo	Vacuum, direct-acting
Dimensions	F 11.6in. dia. discs, wide shoes R 11.6in. dia. discs, wide shoes
Swept area	F 212 sq. in., R 198 sq. in. Total 410 sq. in. (304 sq. in./ton laden)

WHEELS

Type	Pressed steel disc., 5-stud fixing 5in., wide rim
Tyres — make	Pirelli Cinturato
— type	Radial ply tubed
— size	165-15in.: 175-15in. on 145E

EQUIPMENT

Battery	12-Volt 60 Ah.
Alternator	55 amp a.c.
Headlamps	Robo 100/90 watt (total) halogen, with remote-controlled wipers
Reversing lamp	Extra
Electric fuses	12
Screen wipers	Two-speed, self-parking
Screen washer	Standard, electric
Interior heater	Standard, thermostatic water valve
Heated backlight	Standard, two-level
Safety belts	Standard
Interior trim	Leather and PVC seats, PVC headlining
Floor covering	Carpet
Jack	Geared screw pillar
Jacking points	2 each side under sills
Windscreen	Laminated
Underbody protection	Underbody rails galvanized before painting; sealing compound elsewhere