Motorway Express

**Dated but rejuvenated by fuel-injected engine;
effortless high-speed cruising;
poor visibility; very heavy steering; good ride;
superbly finished but expensive**

To many the Volvo 1800 is the ultimate grand tourer. Perhaps frequent appearances on television in *The Saint* series as Simon Templar's personal transport have irretrievably linked the Volvo's distinctive shape with excitement. In this context it is surprising to reflect that the basic design is 10 years old.

Volvos have been available here since 1959, the P1800, as the car was originally known, appearing late the following year. Initially the bodies were built by Jensen Motors but in 1963 Volvo took over, gave the car a more powerful version of the 1780 cc B18 engine and renamed it the 18005. With only detail improvements, which included a further increase in power output, the 18005 continued in production until 1968. That year the whole Volvo range received an engine increase to 1985cc, exhaust emission control equipment was fitted as standard and the engine given the designation B20. The announcement of the 1800E in Sweden last year brings history up to date.

It's basically the same car as its predecessor. Alloy wheels, `E' badges on the rear panel, and a slightly different grille identify the new model externally; internally the facia has been improved and the seats now have built-in headrests. Under the skin there are now split-circuit brake lines operating all-round discs and of course fuel injection replaces carburetters.

We haven't road tested an 1800 since 1962; even then we thought the driving position rather vintage and the scuttle high. The past decade has seen a dramatic increase in glass area, a

PRICE: £1 ,725 plus £529 7s. 6d. tax equals £2,254 7s. 6d. Extras fitted to test car: wing mirrors S (pair). Total as tested £2,259 7s. 6d.

general lowering of waist lines and considerable progress in the field of ergonomics. These factors combine to make the substantially unchanged Volvo seem positively old fashioned though the adoption of Bosch electronic fuel injection has certainly give the car a lot more zest.

The increased power, up from 105 to 120 bhp DIN, is reflected by the performance figures-a maximum speed of 108 mph and a 0-50 mph time of 7.1 sec. Even so, the 1800E is still more of a marathon runner than a sprinter. The standard overdrive makes it a very relaxed high-speed tourer and reasonably economical. But its performance on secondary roads is less satisfactory and it doesn't compare well with some of its more modern rivals in the £2300 bracket.

As Sweden is a fellow EFTA country the price is not inflated by import duty. What you pay for is the car's superb finish and general quality feel. Volvo AB are the largest foreign buyers of British-made automobile equipment (about £21 million annually) so patriotic buyers need have few qualms about not buying British. Imports began a couple of months ago but Volvo intend to sell the 1800E in limited numbers only, so if you are prepared to pay Elan or E-type money for Volvo engineering in a sporting tourer then the 1800E is worth short-listing.

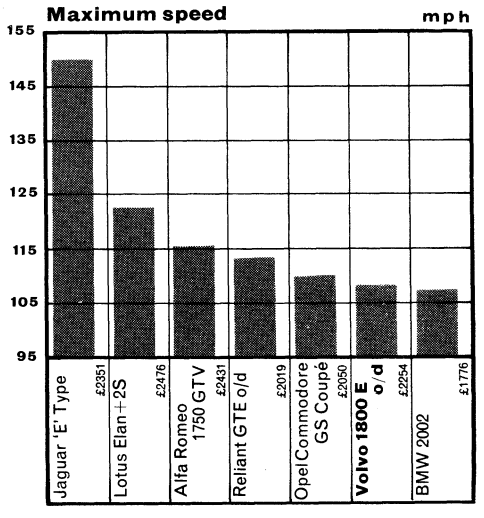
Performance and economy

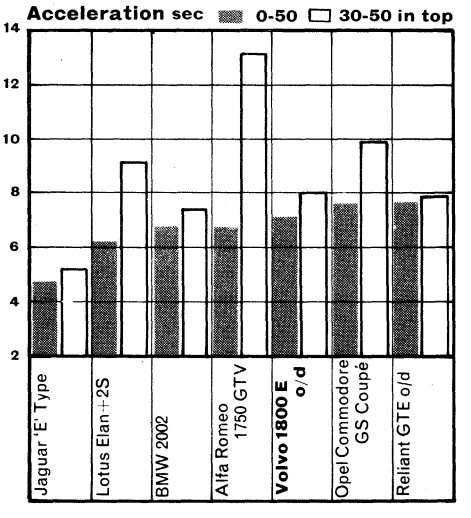
The Bosch electronic fuel-injection equipment used on the 1800E (the E refers to fuel injection) includes an electronic control unit. This picks up signals from various senders in the engine and then regulates the opening time of the injection valves and hence the amount of fuel supplied. The senders transmit information to the control unit on engine rpm, cooling water temperature, inlet air temperature, manifold vacuum and the position of the throttle butterfly which is located at the forward end of the cast alloy inlet manifold. An electric fuel pump, aided by a pressure regulator, maintains a steady pressure of 30 psi to the injection nozzles, themselves located just upstream of the inlet valves.

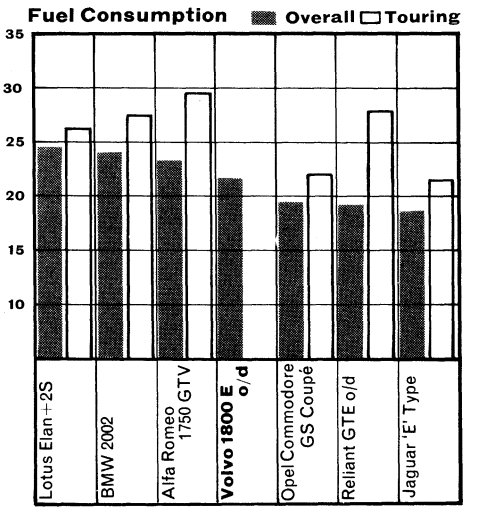
The cold start procedure is to leave the throttle alone and to keep the starter turning for up to 15 seconds until the engine fires. At each new attempt a starting valve functions and squirts fuel into the inlet manifold. Nevertheless as cold starting is not immediate and the engine hesitates before it runs evenly, it's best to remain stationary until the control unit sorts things out. Then the car will pull away without hesitation. The warm-up period is very brief. For subsequent hot starts, you depress the accelerator half way and let the slow pre-engaged starter turn the engine until it fires.

The additional capacity of the B20 engine was obtained by increasing the bore of the B18 from 84.14 to 89.9 mm, keeping the stroke constant at 80 mm. So in its current 2-litre form the unit is still oversquare. The crankshaft runs in five main bearings, and the engine is normally remarkably smooth, though very rough and tappety at idle. The rev counter has a striped red

PERFORMANCE







Performance tests carried out by *Motor's* staff at the Motor Industry Research Association proving ground, Lindley.

Conditions

Weather: Dry, sunny wind, 0-15 mph
Temperature: 78-92°F
Barometer 29.51-29.46 in. hg.
Surface: Dry tarmacadam
Fuel: Premium 98 octane (RM), 4 Star rating

Maximum Speeds

	mph	kph
Mean lap banked circuit	108.0	173.8
Best one-way ¼-mile	112.5	181.0
3rd gear } at 6000 rpm	76	122
2nd gear } at 6000 rpm	52	83
1st gear } at 6000 rpm	32	52

"Maximile" speed: (Timed quarter mile after 1 mile accelerating from rest)

Mean	109.8	—
Best	112.5	—

Acceleration Times

mph	sec
0-30	3.3
0-40	5.2
0-50	7.1
0-60	9.6
0-70	13.0
0-80	16.7
0-90	22.9
0-100	31.4
Standing quarter mile	17.4
Standing kilometre	32.1

mph	O/d Top sec	Top sec	3rd sec
10-30	—	—	6.5
20-40	12.0	8.4	6.0
30-50	11.0	8.0	5.6
40-60	11.5	8.0	5.6
50-70	12.2	8.4	6.1
60-80	13.6	9.1	6.7
70-90	16.0	10.7	—
80-100	—	13.9	—

Fuel Consumption

Overall	21.75 mpg (= 13.0 litres/100km)
Total test distance	1532 miles

Brakes

Pedal pressure, deceleration and equivalent stopping distance from 30 mph

lb.	g.	ft.
25	0.27	111
50	0.57	53
75	1.00	30
Handbrake	0.37	81

Fade Test

20 stops at ½g deceleration at 1 min. intervals from a speed midway between 40 mph and maximum speed (=74 mph)

	lb.
Pedal force at beginning	50
Pedal force at 10th stop	65
Pedal force at 20th stop	50

Steering

	ft.
Turning circle between kerbs:	
Left	26⅔
Right	28
Turns of steering wheel from lock to lock	3.6
Steering wheel deflection for 50 ft. diameter circle	1.0 turns

Clutch

Free pedal movement	= 2 in.
Additional movement to disengage clutch completely	= 4 in.
Maximum pedal load	=40 lb.

Speedometer

Indicated	10	20	30	40	50	60	70	
True	9	18	27.5	36	45	55	63.5	
Indicated	80	90	100					
True	72.5	81	90					

Distance recorder 5% fast

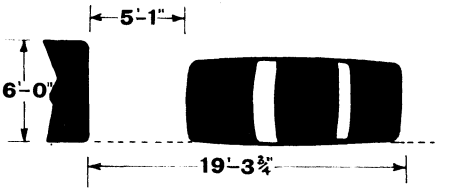
Weight

Kerb weight (unladen with fuel for approximately 50 miles) 22.25 cwt.

Front/rear distribution	54/46
Weight laden as tested	26.0 cwt.

Parkability

Gap needed to clear 6 ft. wide obstruction in front



line running from 6000-6500 rpm and beyond that solid red defines the prohibited area.

Maximum power of 120 bhp DIN is given at 6000 rpm, but the engine feels delightfully unstrained at 6500 rpm and we used this for the performance tests to accelerate to 50 mph in 7.1 sec. and to the quarter mile post in 17.4 sec, impressive figures for a 22 cwt. car. Over a lap of the banked MIRA track we recorded 108 mph and a best quarter mile of 112.5 mph. On the slowing-down lap the car emitted clouds of oil smoke from the exhaust; presumably oil was being drawn into the combustion chambers through the valve guides. Although alarming it didn't seem to have any detrimental effect on the car's performance and only one pint of oil was needed during our 1500-mile test.

Unfortunately the engine's smoothness at the top end is not matched by low speed flexibility. At low rpm it is snatchy and there are loud unpleasant vibrations from under the dash panel up to 25 mph in top and up to 20 mph in third. The engine is not happy pulling below 2000 rpm in the higher gears, which is reflected in the acceleration times; beyond 2000 rpm it pulls strongly. This high gearing pays off in fuel economy-we achieved nearly 22 mpg overall and an intermediate check showed over 23 mpg; on a long run at a steady 70 mph we recorded 26 mpg. The B20E engine has a higher compression ratio than the B20 as well as larger inlet valves and a different camshaft. But even at 10.5:1 the makers recommend only 97 octane fuel; we used 4-star 98 octane petrol and could detect no pinking.

Transmission

The 1800E excels on long straight-road journeys. This is in no small measure due to the high gearing, which some of our testers thought too high for the car's power output. Nevertheless it just managed to start on the 1-in-3 test hill, though a previous attempt immediately after the acceleration runs had failed. The clutch pedal pressure (40 lbs) is too high and pedal travel excessive-a total movement of 6 in. is required fully to disengage the drive; we suspect the cable needed adjustment.

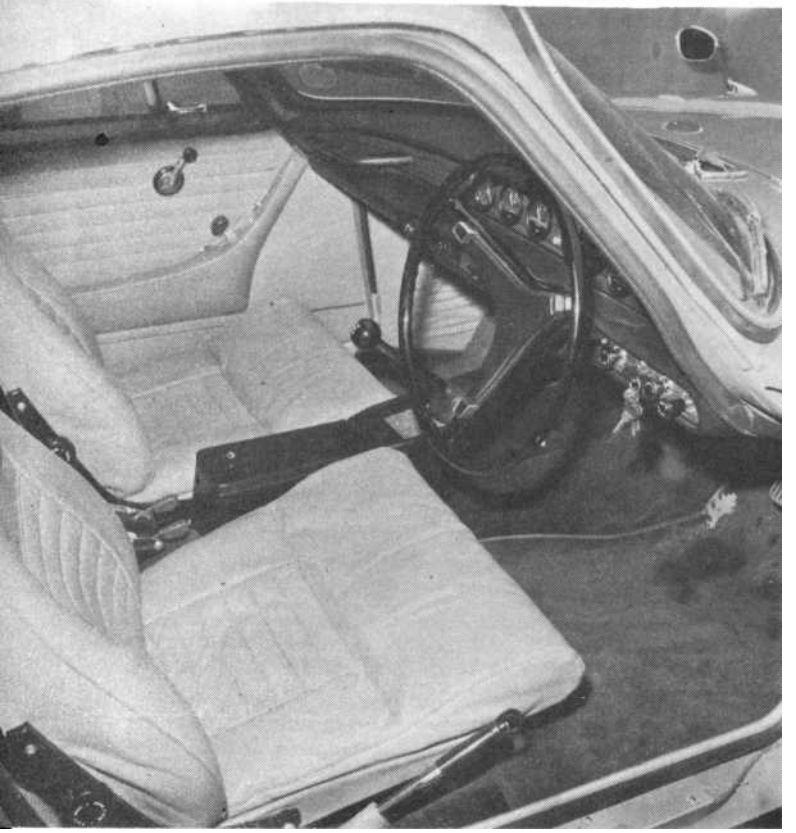
The ratios are quite well spaced with 70 mph easily attained in third; it is geared to do 76 mph at 6000 rpm. The overdrive operates on top gear only and is controlled by a stalk mounted on the left of the steering column shroud. It engages with a perceptible thump to reveal a really unstrained high-speed cruise capability. Top gear at 1:1 gives a fairly average 16.9 mph per 1000 rpm but overdrive top at 0.797:1 give a really long-legged 21.2 mph. A red light on the facia, which can be distracting at night, shines when overdrive is engaged. The Laycock unit slurs out of engagement with no jarring.

There's an enormous circular knob mounted atop a stout gearlever which is pleasant to grasp, unlike many modern spindly devices, and controls a smooth though rather heavy change. This is particularly noticeable when the gearbox oil is cold-the change from first to second needs a firm hand. It is spring loaded towards third and top and works in a semi-horizontal plane, so you tend to place your hand either on the forward or the under

An imposing front; the B20 badge refers to the 2 litre engine

The rear compartment is best considered as additional luggage space rather than a passengers' seat. Straps are provided to hold luggage in situ. Our 5 ft. 10 in. tester has his head firmly pinned on the roof and little room for his legs

Flat seats set too low do not help to improve basically poor visibility. They don't provide much lateral support either. The circular knob on the side of the seat adjusts a lumbar support pad. The steering is very heavy



side of the knob when preparing to change. The movement from second to third is particularly slick-just a forward prod and it's home--and even a really fierce change won't beat the synchromesh. Both the gearbox and final drive are quiet.

Handling and brakes

One thing that did not endear the 1800E to us was its heavy cam and gear steering. When parking it requires a lot of effort to get any movement at the road wheels; when the car is stationary it is not possible to turn the wheel with one arm. But once it's moving the gearing (3.6 turns lock-to-lock) is good and only one turn is required to scribe a 50 ft. circle-a typical right-angled turn. The turning circle is reasonable for a largish car, which it needs to be as three-point turns soon bring the driver out in a sweat. Out of town the steering is acceptable but ponderous. It's fairly accurate and readily transmits information on front-end breakaway to the driver.

Basically the Volvo understeers and displays quite a lot of body roll. Wishbones and coil springs are used at the front (mounted on a sub-frame) with a substantial anti-roll bar to increase front-end weight transfer and thus promote understeer; but towards the cornering limit controllable roll oversteer predominates. The live rear axle is also coil-sprung and located fore and aft by trailing arms with a Panhard rod to control lateral movements. We think the rather imprecise behaviour of the rear end during high speed cornering may be due to the very large rubber bushes in which the trailing links are located at their forward end.

Our test car was shod with Irish-made Michelin XAS tyres which provided good squeal-free grip in the dry but were prone to rather sudden breakaway in the wet. They are mounted on large handsome five-stud "mag" wheels which have a steel rim and alloy centre; they are made by Cromodora Fergat.

There are servo-assisted discs all round, and dual-circuit hydraulics with three wheels in each circuit so that if one circuit is damaged 80 per cent braking efficiency is maintained. The handbrake operates on separate drums and achieved a 0.37 g stop, but would not hold the car on the 1-in-3 hill. With 25 lb brake pedal pressure we recorded a 0.27 g stop; trebling the pressure to 75 lb gave a creditable 1 g. The car stopping all square.

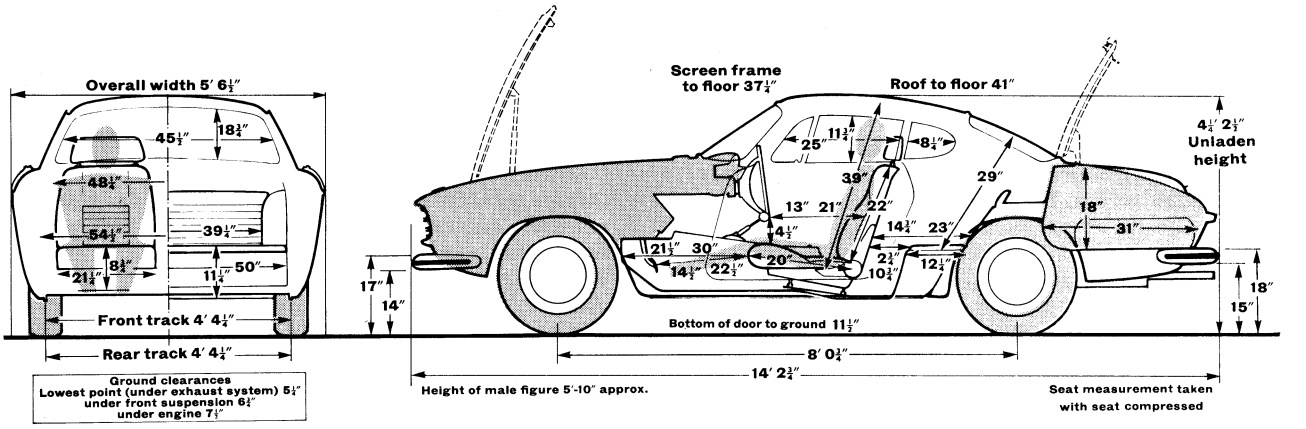
The brakes are very reassuring during normal driving so we were surprised to find their performance was affected by our fade test. Initially 50 lb pressure was required to give a 0.5 g stop, but after only seven applications (when the brakes began to smell) this rose to 75 lb. They recovered towards the end of the test. The watersplash had no effect on their performance.

Comfort and controls

One of the outstanding features of the 1800E is undoubtedly the ride, which belies its live axle specification. Small ridges and bumps are soaked up without murmur, and no joggling is transmitted to the body. Yet the suspension, though evidently fairly soft (witness the body roll), feels taught and is in no way

The spare wheel occupies much of the boot which only took 5.3 cu. ft. of our test boxes. The pile on the left fits on the ledge behind the front seats giving a total luggage capacity (assuming only two occupants) of 10 cu. ft.

SPECIFICATION



1985 cc four-cylinder engine with fuel injection; live rear axle; all-round disc brakes

Engine

Block material	Cast iron
Head material	Cast iron
Cylinders	Four in line
Cooling system	Water, pump, thermostat and viscous coupling fan; sealed
Bore and stroke	88.9 mm (3.50 in.) x 80 mm (3.15 in.)
Cubic capacity	1985 cc (121 cu. in.)
Main bearings	Five
Valves	Pushrod operated ohv
Compression ratio	10.5 : 1
Induction	Bosch electronically controlled fuel injection
Fuel pump	Electric
Oil filter	Full flow
Max. power (net)	120 bhp at 6000 rpm
Max. power (gross)	130 bhp at 6000 rpm
Max. torque (net)	123 lb. ft. at 3500 rpm
Max. torque (gross)	130 lb. ft at 3500 rpm

Transmission

Clutch	8½ in. dia. sdp, diaphragm spring
Internal gearbox ratios	
Overdrive top	0.797
Top gear	1.00
3rd gear	1.34
2nd gear	1.97
1st gear	3.14
Reverse	3.54
Synchromesh	On all forward gears
Overdrive type	Laycock J-type
Final drive (type and ratio)	Hypoid bevel, 4.30:1
Mph at 1000 rpm in:	
O/d top gear	21.2
Top gear	16.9
3rd gear	12.61
2nd gear	8.6
1st gear	5.4

Chassis and body

Construction Unitary

Brakes

Type	Split circuit servo-assisted discs all-round. Drum for handbrake
Dimensions	Front 10.59 in. dia. disc, rear 11.6 in. dia. disc
Friction areas:	
Front:	Effective area 27 sq. in.
Rear:	Effective area 15.5 sq. in.

Suspension and steering

Front	Coil springs, wishbones with anti-roll bar.
Rear	Coil springs, live axle located by trailing arms and a Panhard rod
Shock absorbers:	
Front and rear	Double acting telescopic
Steering type	Gemmer cam and roller
Tyres	165 HR 15 Michelin XAS
Wheels	Pressed steel rims with cast-aluminium hubs
Rim size	5J

Coachwork and equipment

Starting handle	No
Tool kit contents	Box spanner for plugs and wheel nuts; tommy bar; adjustable spanner; pliers; plain blade and crosshead screwdrivers
Jack	Scissor type
Jacking points	Four
Battery	12 volt, negative earth, 60 amp hrs. capacity
Number of electrical fuses	12
Headlamps	45/40W
Indicators	Self-cancelling flashers
Reversing lamp	Yes, operated automatically by gear lever
Screen wipers	Two-speed electric
Screen washers	Electric
Sun visors	Two
Locks:	
With ignition key	Steering lock
With other keys	a. doors and boot; b. central lidded console
Interior heater	Fresh air type with booster fan
Upholstery	Leather
Floor covering	Carpet
Alternative body styles	None
Maximum load	484 lb. without driver

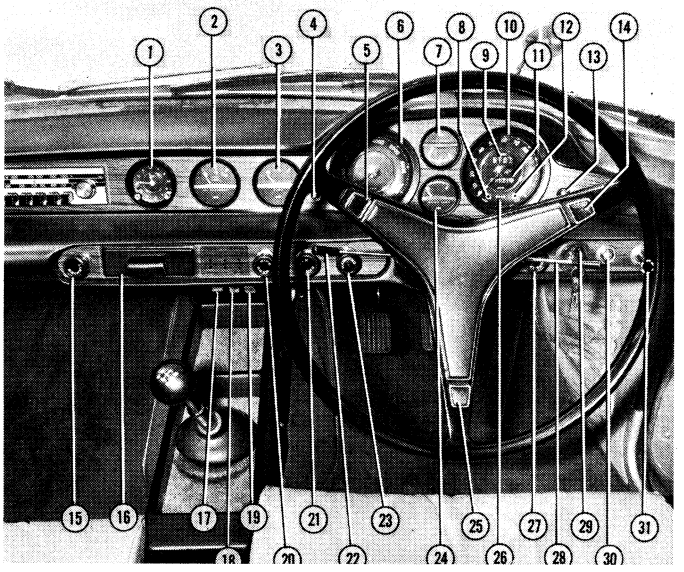
Maintenance

Fuel tank capacity	10 galls
Sump	6.6 pints SAE 20W-50 (incl. filter)
Gearbox	2.46 pints SAE 20W-50 (incl. overdrive)
Rear axle	2.28 pints SAE 90 EP
Steering gear	0.44 pints SAE 90 EP
Coolant	1.87 galls (1 drain tap)
Chassis lubrication	None
Minimum service interval	6000 miles

Ignition timing	10 deg. btdc at 700-800 rpm vacuum pipe disconnected
Contact breaker gap	0.016-0.020 in.
Sparking plug gap	0.028-0.032 in.
Sparking plug type.	Bosch W225T35
Tappet clearance (warm or cold)	Inlet 0.016 in. Exhaust 0.016 in.
Valve timing:	
inlet opens	29° btdc
inlet closes	71° abdc
exhaust opens	71° bbdc
exhaust closes	29°. atdc
Rear wheel toe-in	0—.16 in.
Camber angle.	0—+½°
Castor angle	0—+1°
King pin inclination	8° with no camber
Tyre pressures:	
Front	26 psi
Rear	28 psi

Safety check list

Steering Assembly	
Steering box position	Mounted on o/s front inner wing
Steering column collapsible	Yes
Steering wheel boss padded	Yes
Steering wheel dished	No
Instrument panel	
Projecting switches	Yes, but of collapsible type
Sharp cowls	None
Padding	Yes, top and bottom
Windscreen and Visibility	
Screen type	Laminated
Pillars padded	No
Standard driving mirrors	Day/night interior mirror
Interior mirror framed	Yes
Interior mirror collapsible	Yes
Sun visors	Two
Seats and Harness	
Attachments to floor	On slides
Do they tip forward?	Yes
Headrest attachment points	Headrests standard
Safety harness	Static lap and diagonal
Doors	
Projecting handles	Window winders
Anti-burst locks	Yes



1 clock. 2 oil pressure gauge. 3 fuel gauge. 4 overdrive tell-tale. 5, 14 and 25 horn. 6 tachometer. 7 oil temperature gauge. 8 battery charge warning light. 9 odometer. 10 speedometer. 11 mileometer. 12 main beam tell-tale. 13 handbrake and brake system warning light. 15 cigar lighter. 16 ashtray. 17 and 18 heater distribution controls. 19 heater temperature control. 20 wipers and washers. 21 heater booster fan. 22 indicator/headlamp flasher stalk. 23 hazard warning lights. 24 water temperature gauge. 26 indicator tell-tale. 27 instrument panel lighting rheostat. 28 overdrive stalk. 29 steering lock/ignition/starter. 30 side and headlights. 31 heated rear window

soggy. Over long-wavelength irregularities the car displays a certain rear wheel steering tendency, with the back end waddling from side to side, but this is not sufficient to cause alarm. The body remains fairly pinch free over such surfaces.

Seats can spoil a comfortable ride if not properly tuned to the suspension. Volvo got their sums right. Although we think the seats are set too low and too flat, lumbar support is good. Lateral support is poor and is not helped by the slippery leather upholstery. There is plenty of fore and aft adjustment of the seat for even the tallest person, but he will have to sit so far forward fully to disengage the clutch that it is unlikely he will use the full range of adjustment. So you sit rather too close to the vertical steering wheel and the backrest doesn't recline far enough for you to get a straight arm driving position. (You would need strong biceps to turn the wheel with straight arms.)

The pedals are reasonably well placed for heel and toe changes but the brake could be closer to the accelerator, and one of our testers thought the former awkwardly offset to the left. The handbrake is mounted to the right of the driver's seat with the release button surrounded by a circular ring to prevent accidental operation when climbing in or out-a clever idea.

Minor controls are operated by push-pull switches spread across the facia. Only the indicators and headlamp flashers are controlled by a stalk which is too short and too far from the wheel rim. Wipers and washers are on the left of the wheel, one click for slow, the second fast, and the third for fast and washers. So you merely have to pull the switch right out to get wash and wipe. On the other side of the wheel, which has a horn button mounted in each of its three spokes, a switch operates powerful lights on main beam; the dip is a self-centring micro-switch on the indicator stalk.

The car falls down badly on visibility. Sitting very low down in a car with high sides is not a good starting point; added to this is a very limited glass area (some described the windows as portholes). With high headrests on the front seats you can't see much to the rear either (though the pronounced tail fins are useful parking aids), so the optional wing-mounted mirrors are essential. And the lack of three-quarter rear vision becomes almost dangerous when joining a main road from an oblique junction, such corners must be approached at right angles van-style for a safe exit.

Symmetrical wipers sweep a reasonable arc, but there is a blind spot on the right of the screen. For rear seat passengers the accommodation is claustrophobic they really can't see anything with the headrests blocking the view forwards and only tiny slots to the side. But the rear seats are not really meant for passengers, though they're fairly accessible through the wide doors. But once in the back your head is pinned to the roof and if the occupants of the front seats are selfish there's no rear leg room. It's not much better with just one person in the back.

Cars with a price tag of £2300 should have a proper through-flow ventilation system. Ford manage to fit one of the best there is on their bread-and-butter Cortina. Volvo apparently don't like facia-level fresh air vents as they think there is a possibility of, for example, cigarette ash being blown into the driver's eyes. So the 1800E has vents under the dash, which are not really adequate, and they don't cope with radiated heat from the transmission tunnel. To keep cool you have to open a window, itself an art as the winders are stiff to operate and very close to the door panels. Moreover, they cause a lot of wind roar. The heater, as to be expected in a Swedish car, is very efficient.

Induction roar is well muted while the exhaust note is pleasantly `fruity'. A single exhaust splits into two tailpipes at the rear of the car.

The viscous-coupled fan helps to subdue engine noise, which at 70 mph in overdrive top (3300 rpm) is very low, but the sealing of the frameless windows is not good particularly in side winds. Road noise is low and radial thump almost imperceptible.

Fittings and furniture

An imposing array of instruments, including an oil temperature gauge, faces the driver. Volvo warned us that the speedometer was inaccurate and because no spare was available we had to make allowances for a 10 per cent error. It is matched by a rev counter and the two are separated by oil and water temperature gauges. The oil gauge needle rarely moved but that for the water temperature often approached the red sector; the handbook said this was acceptable for short periods. The facia is attractively laid out and the instruments mounted on a simulated matt wood background with black leathercloth top and bottom. Standard equipment includes a heated rear window (there is an alternator to cope with supply) which has a two-position switch, one for clearing the window and the other for keeping it clear. There are courtesy switches for two rear-mounted interior lights on both doors-the lights can also be operated by a flick switch above the driver's knees or by pulling out the trailing edge of the lights themselves. There is a map-reading light on the passenger's side.

There is plenty of oddment storage space inside the car. Between the seats a carpeted console within easy reach of the driver takes oddments and behind it there is a lidded lockable box. In each footwell there is a map pocket and behind the rear seat a deep full-width shelf for more bulky articles.

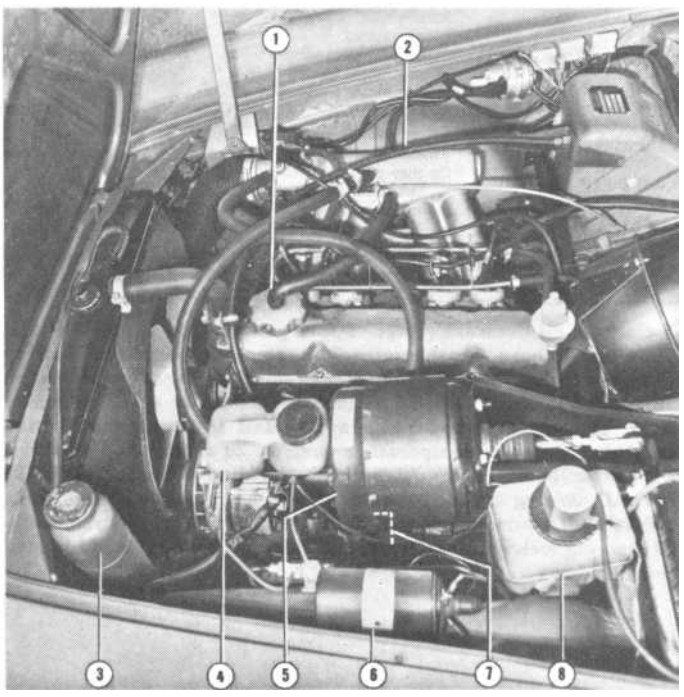
We think most prospective buyers will regard the rear compartment as an extension of the luggage capacity rather than potential occupant space. Volvo evidently planned it this way, too, so the accommodation in proportion to total vehicle size is small. The backrest of the rear ledge folds flat and under the squab there are straps for retaining luggage. We got our biggest test box in here though it only just went through the door. Without restricting rear visibility we got a total of 4.7 cu. ft. inside the car and an additional 5.3 cu. ft. in the boot. Much of the boot space is taken by the spare which is concealed in a neat cover. The unlit boot has a rubber mat on the floor.

Volvo's own brand of seat belts are fitted; they are easy to use and adjust.

Servicing and accessibility

The self-propping bonnet (it uses a stay like that on a BLMC 1800) is released by a substantial lever under the dashboard. Most items are readily accessible, though the distributor is rather hidden by the brake servo unit. The labelled fuse box is in the cockpit mounted on the nearside bulkhead above the passenger's legs.

There are now about 300 Volvo dealers and distributors in Britain. After the first 3000 miles the 1800E needs attention at 6000-mile intervals when the oil is changed. There are no greasing points, and there is a towing bracket welded to the front subframe should your Volvo ever break down.



1 oil filler cap. 2 clutch cable. 3 coolant expansion tank with filler cap. 4 brake fluid reservoir. 5 brake servo unit. 6 coil. 7 dipstick (hidden). 8 windscreen washer reservoir

MAKE: Volvo. MODEL: 1800E. MAKERS: Aktiebolaget Volvo Goteborg, Sweden. CONCESSIONAIRES: Volvo Concessionaires Ltd, Raeburn Road, Ipswich, Suffolk