Volvo V70 Bi-fuel

What’s different?
850 became S70/V70 a year ago, with mainly cosmetic tweaks. Bi-fuel offers a natural gas alternative to petrol at no extra cost.

LIKE MADAM BUTTERFLY WAITING for Pinkerton, the environmentalists and motor industry alike have been hankering for too long for the wonder battery that can deliver a truly practical electric car. Perhaps it would be better for them to cut their losses and settle for the chap around the corner! That’s what the proponents of CNG (natural gas) would have us do – it’s here, it’s clean and it’s cheap.

Volvo has been converting its trucks and buses for some time, but now it’s added an already-converted car to its range. For the time being, it charges no extra for the second fuel system that’s added to its 2.5 10-valve S (saloon) or V (estate) car.

We took a V70 Automatic because we had already got the weight of an ordinary (petrol-only) version of the 850 before (see R9402). Talking of weight, the gas conversion adds around 160kg to the car’s kerb weight, so it comes as no surprise to discover that this Bi-fuel’s performance and petrol consumption are both compromised compared with the ordinary version; 30–70mph takes 1½sec longer and it loses 1½–2mpg. Apart from that, it behaves impeccably, although our car did display a peculiar warble from its exhaust at around 1500rpm.

But what happens when you switch to gas? The first problem is finding a filling station – they’re few and far between at present. CNG is sold by weight instead of volume, and our car took enough to cover only a third of the distance that could be comfortably managed on petrol between forecourt stops. Theoretically you can rent (at £60 a month) or buy (£3000) your own home dispenser and top up from the domestic gas supply. The real future lies in greater acceptance, resulting in the proliferation of gas stations, of course. It’s also worth remembering that a fleet of tankers wouldn’t be required to meet town demand, if there’s a gas supply on hand, in the infrastructure.

OK, so we’ve filled the tank and we flick the facia switch – a warning lamp winks a few times, then stays on (too inconspicuously) to tell us we’re now running on gas – otherwise, we would never know! In urgent overtaking, you can subjectively detect a certain loss of urge (30–70mph acceleration, flat out, grows by a further 2sec), but other than some tinkling sounds.
PERFORMANCE

**Acceleration**

<table>
<thead>
<tr>
<th>mph</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>THROUGH THE GEARS</td>
<td>1.9/2.2</td>
<td>4.6/5.4</td>
<td>7.8/9.1</td>
<td>11.4/13.6</td>
<td></td>
</tr>
</tbody>
</table>

20 mph

<table>
<thead>
<tr>
<th>mph</th>
<th>30</th>
<th>40</th>
<th>50</th>
<th>60</th>
<th>70</th>
</tr>
</thead>
<tbody>
<tr>
<td>SPEED RANGES USING KICKDOWN</td>
<td>3.7/4.2</td>
<td>5.9/6.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

MAXIMUM SPEEDS

<table>
<thead>
<tr>
<th>REVS PER MINUTE</th>
<th>1st/2nd 5600/5800</th>
<th>3rd 5800</th>
<th>4th 4650/4375</th>
</tr>
</thead>
<tbody>
<tr>
<td>mph</td>
<td>4</td>
<td>108</td>
<td>113</td>
</tr>
</tbody>
</table>

(Only fourth gear different using gas)

SAFETY AND SECURITY FEATURES

Assessed on their effectiveness and convenience (the more black boxes the better)

- **Seatbelts**: front ☐☐☐ rear ☐☐☐
- **Door locking**: central locking?
- **Head restraints**: front ☐☐☐ rear ☐☐☐
- **Auto window closure**: deadlocks?
- **Interior safety padding**: ☐☐☐
- **Driver's airbag?**: ☑
- **Other airbags? (side type)**: ☑
- **Side impact protection**: ☐☐☐
- **Luggage**: secure from interior/hidden from view (not estate) ☐☐☐
- **Alarm**: ☐☐☐
- **Fuel anti-spillage**: ☐☐☐
- **Engine immobilised?**: ☑

☑ standard on test car ☐ factory fitted option ☒ not available

BRAKES

**Pedal feel**: ☐☐☐ Behaviour in an emergency ☐☐☐ **Handbrake**: ☐☐☐

Dry road stopping distance from 50mph (with standard ABS)

(A good-to-average best stop is about 28m at 20-30kg pedal load)

- 9kg:
- 15kg: 28m
- 18kg: 26m (.9kg - best stop) ABS working
- 21kg:

Distance 10m 20m 30m 40m 50m 60m

Fade test: pedal load required for a moderate (34m/.75g) stop: 11kg at start of test, 13kg at end of test. (Ideal brakes show no change)

FUEL CONSUMPTION

Fuel grade: Bi-fuel; unleaded petrol or natural gas (CNG)

**Type of use** - with air conditioning off*:

<table>
<thead>
<tr>
<th>petrol/mpg</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the city - heavy traffic</td>
</tr>
<tr>
<td>In the country - quiet driving</td>
</tr>
<tr>
<td>Typical mpg overall - petrol</td>
</tr>
</tbody>
</table>

**Realistic tank range (not nominal tank capacity)**: 65 litres/370 miles

**Typical gas consumption**: 9.4 miles per kg/29.5 mpg

(1kg equivalent to 1.452 litres) - see text

Gas tank range to empty: 13.45kg/125 miles

*with air conditioning switched on, consumption will increase by 2–4% in winter and 4–8% in summer

MEASUREMENTS

**Centimetres**

**Estate car**

*with mirrors folded tabove gas tank

T: typical back seat space behind medium-sized front occupants

<table>
<thead>
<tr>
<th>141+5</th>
<th>85-112</th>
</tr>
</thead>
<tbody>
<tr>
<td>90-96 (with sunroof)</td>
<td>94</td>
</tr>
<tr>
<td>59</td>
<td></td>
</tr>
<tr>
<td>472</td>
<td></td>
</tr>
<tr>
<td>113</td>
<td></td>
</tr>
<tr>
<td>15</td>
<td></td>
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<tr>
<td>38</td>
<td></td>
</tr>
<tr>
<td>77</td>
<td></td>
</tr>
<tr>
<td>472</td>
<td>113</td>
</tr>
<tr>
<td>113-137</td>
<td></td>
</tr>
<tr>
<td>137</td>
<td></td>
</tr>
<tr>
<td>203</td>
<td>176°</td>
</tr>
</tbody>
</table>

T: typical back seat space behind medium-sized front occupants

*with mirrors folded tabove gas tank
from the tank, mounted amidships, it’s impossible to
detect any other differences — unless you get out and
smell the exhaust.

It’s this exhaust emission that’s one of the two big
reasons for running on gas — it’s much cleaner and
more environmentally friendly. All the nasties, such
as carbon monoxide, nitrous oxide and hydrocarbons
are significantly reduced, and there’s no benzene or
sulphur to worry about, either. In fact, natural gas is
mostly methane, and although greenhouse gas is still
present in the exhaust, there’s less of it.

The other big advantage of CNG is that it’s cheap and
plentiful. Its price is, of course, ruled by politics, but
there seems to be a clear commitment to give it taxation
preference against fossil fuels into the foreseeable
future, because of its environmental advantages.

At present pump prices, our car would have needed a
41mpg overall result on petrol to ensure the same cost-
per-mile on the two fuels — as things stand, we paid 60
per cent more on petrol to cover the same distance.

It’s all the more frustrating then that we used up our
gas so soon, despite the intrusive, bulky tank that
seriously compromised our estate car’s load-carrying
potential. This is a significant disadvantage and it
won’t get any better in a smaller car, either. Worries
about safety seem to be unfounded, however — the
tank is built to withstand most assaults that would
spill petrol everywhere and the pressurised system
prevents vapour leaks even when refuelling. If you
run out of gas, the car simply reverts to petrol by
itself, with only the flashing warning lamp to
confirm the fact; you certainly don’t detect anything
from underbonnet.

**Another look at the V70**

The change of model designation, with subtle styling
revisions but no radical changes, has done nothing to
dampen our enthusiasm and respect for Volvo’s best
model. Indeed, our 1994 test car’s weighty accelerator,
manually adjusted driver’s door mirror and key-only
door opening have all been upgraded. The remote-
control locking isn’t used if you’re leaving the dog in
the car, however — using the driver’s door key locks
the car without the alarm, but having no keyhole on
the other side is a nuisance at times.

The V70 still rides firmly, though not too harshly,
but it steers and handles with real poise. We like the
auto ’box, too — its shift sensitivity is set just right in
the two normal (S and E) modes provided, except that
first gear seemed more willing to engage in E than in
S — peculiar.

The optional climate control is dreadfully
expensive, but works splendidly, with separate
temperature variation from side to side, as well as
upstairs and down.

Volvo’s commitment to safety is unquestionable,
but there’s a touch of the nanny-state about its
clicking and flashing seatbelt reminder and its
headlamps-on-all-the-time. Incidentally, we find
headlamp signalling impractical with this regime —
you can’t flash them when they’re already on!

Despite that gas tank, seating remains
uncompromised and very comfortable, with two
separate load compartments available when the back
seat is folded away.

**VERDICT**

Full marks to Volvo for leading the way — the first
bi-fuel car in its normal line-up, not a rehashed
retrofit. The benefits of this are noticeably better
fuel economy, even before costs are taken into
account, no major performance penalties and
excellent driveability, free of tantrums.

The intrusive tank is a serious snag, but on the
other hand, its limited range is less of a problem if
you view this dual-fuel car as an alternative to the
hybrid that some manufacturers seem to be
backing at present. Hybrids need two power units
— with bulky batteries — which makes this Volvo’s
two fuel tanks seem straightforward, by
comparison.

The hybrid concept envisages a diesel engine to
propel the car and recharge the batteries out on
the open road, with a switch to battery/electric
propulsion (with zero emissions) in town use. This
bi-fuel concept seriously challenges this approach
with a technology that’s available now. The car
could be designed to start up from cold on gas and
automatically switch between fuels once the
catalyser starts working 100 per cent.

Gas in the city, petrol (or diesel) in the country —
it begins to make a lot of sense, but it needs a lot
of converts to get the show on the road and iron
out the snags in the pipeline.

<table>
<thead>
<tr>
<th>Bi-fuel likes . . . and gripes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Relatively “clean” exhaust, especially from cold starts . . . Gas tell-tale should be adjacent to gauge</td>
</tr>
<tr>
<td>Cleaner burning with extended oil and filter change intervals . . . Gauge reading unreliable and erratic</td>
</tr>
<tr>
<td>Favourable taxation prospects . . . Tank intrudes on luggage space</td>
</tr>
<tr>
<td>Fewer tanker deliveries . . . Lack of filling points for most potential users (unless you’re lucky)</td>
</tr>
<tr>
<td>Less complicated than a hybrid . . . Extra weight blunts performance</td>
</tr>
<tr>
<td>Plentiful North Sea resource, domestically piped</td>
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</tbody>
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