Trucker

Career | Technology | Passion

SPECIAL

4/2022

1ST PLACE IN OVERALL CONSUMPTION

VOLVO FH 500 I-SAVE

Power truck with economy package

Heading upwind

The Volvo FH 500 takes on the TRUCKER Supertest with improved aerodynamics. And of course, the "I-Save" fuel-saving package is also included. ▸

TEST VEHICLE

Model: Volvo FH 500 I-Save Globetrotter XL
Displacement: 12,800 cm³
Horsepower (kW): 500 (367) at 1,250–1,600 rpm
Torque (Nm): 2800 at 900–1300 rpm
Unladen weight: 7250 kg (400 l diesel, 60 l AdBlue)

Door interior cladding extended downwards and larger wheel arch covers

Volvo Trucks now fills every last crevice in the front of the FH with black silicone

As we all know, every little helps, and this is all the more important when the pressure is on – in this case due to the EU's ambitious climate targets.

That's why the engineers in Gothenburg, Sweden, put their success story, the FH model, to the test once again – in search of that last bit of potential for improvement in terms of aerodynamics. And they found what they were looking for, but even die-hard Volvo enthusiasts will only notice this on second glance. The most striking visual feature is the door interior cladding, which has been extended downwards by a few centimetres. In addition to improved wind resistance, they are supposed to provide another positive side effect: The team at Volvo promises that the step unit is guaranteed to stay dry no matter what the weather is like.

IMPROVEMENTS IN DETAIL

The mudguard linings are now also longer. This way, they move closer to the tyres, which should minimise air turbulence. Volvo is pursuing the same objective with the extended, flexible rubber lip at the bottom of the frame covers.

The compact exterior mirror casings have not escaped unscathed either. Although their basic design remains the same, they now have rounder radii that offer less surface for the headwind to attack. Incidentally, there will be no camera-based mirror replacement system at Volvo Trucks for the time being, according to company headquarters.

Let's move on to the front, where the headlight gaps are now smoothed with silicone. However, in the case of the test vehicle at least, this was not exactly done with the utmost care, as some lines were not applied neatly – but the Swedes promise to improve this. A look behind the two folding treads of the front step reveals just how far the engineers went into detail. When folded in, they now come up against a soft-foam rubber pad, giving them a better fit.

All these measures together should noticeably improve the Cd value and help to reduce fuel consumption by up to 1.2 percent.

The technical aspects of the test vehicle, painted in "Nordic Light Metallic", are not as cutting-edge as the latest measures carried out on the bodywork and plastic: Anyone who orders their new FH today will receive the upgraded model that Volvo Trucks unveiled at the beginning of March. Among other improvements, a new turbo charger and extensive improvements to the I-Shift gearbox and the I-Save package are designed to further reduce fuel consumption.

The digital central cluster offers a wide range of options, including an axle load weighing function

Uphill at 900 rpm thanks to turbo-compound

TURBO-COMPOUND TECHNOLOGY

I-Save is primarily based on turbo-compound technology, in which an additional turbine downstream of the turbo charger converts the energy of the still-hot exhaust gases into kinetic energy and delivers it directly to the crankshaft. This results in 300 additional Newton metres of torque, which the D13 six-cylinder transmits to the driven wheels from 900 revs upwards.

The FH 500 uses this performance advantage primarily to create a feeling of serenity. Despite having a full load on our Fliegl test trailer, the usually fast-shifting I-Shift gearbox was able to take a break on hills most of the time. Even on serious inclines, it went uphill smoothly in top gear at 900 revs. The uphill shifts on the test route could be counted on one hand, despite the long 2.31 rear-axle ratio. And even when the I-Shift did need to get involved on a hill, the needle of the digital bar tachometer never saw the other side of 1200 rpm.

This is a driving strategy that dovetails nicely with the Volvo's other virtues. These include the truck's exemplary noise insulation as well as its handling characteristics. Despite the single-leaf parabolas installed on the front axle of the test vehicle, the FH has excellent suspension characteristics. We would also highly recommend to buyers the smooth electro-hydraulic steering function "Dynamic Steering Evolution", which allows you to choose between pre-set steering responses via the touchscreen in the centre console or to create your own steering response by adjusting various steering parameters.

TORQUE REDUCTION

The Volvo does not mutate into a sluggish Viking as a result of the consistently low engine speeds. Quite the opposite, in fact: It overcame the test hills at an above-average speed, which was reflected in the end in a high average speed of 80.75 km/h for the entire test route.

All the more surprising, then, that Volvo Trucks uses a torque reducer as a further economy measure in the Eco mode we used. This means that the FH consciously rolls uphill a few km/h slower than it could actually manage. Unlike the MAN TGX, whose "Efficiency+" system is simi- ►

Flexible rubber lip extended downwards for less turbulence

When folded in, the treads of the front step now come up against a soft-foam rubber pad, giving them a better fit

Exterior mirror casings now with rounder radii

ENGINE PROS AND CONS

➕ Above-average torque for this performance class thanks to turbo-compound

➖ Sophisticated turbo-compound technology; prices for replacement parts will probably be high in the event of a defect

Top marks for the front step


GLOBETROTTER
VOLVO
FH
FLK 45W
Fliegl
TRAILER
verkehrs
RUNDSCHAU
Fliegl
TRAILER
Trucker
Fliegl

Long and steady: With the 2.31 rear axle, the FH operates at a leisurely 1050 revs at 85 km/h

lar (see TRUCKER 3/2022), the loss of power is barely noticeable behind the steering wheel. Nevertheless, some customers may wonder why they should invest in the optional I-Save package if the greater level of torque it buys is curtailed by the Eco mode.

In the latest technical upgrade mentioned previously, torque reduction is also part of the fuel-saving strategy and goes by the name of "I-Torque". Through the use of more intelligent control units, however, it then takes on a much smarter guise, in which the torque provided is adjusted as needed for each driving situation with the help of the GPS cruise control.

LOW OVERALL CONSUMPTION

The Volvo's fuel consumption, however, is still respectable even with the phased-out technology: On the test route, which as always was "weather-adjusted" by means of our reference vehicle, the FH 500 I-Save converted 24.65 l/100 km into propulsion, which puts it close to the top of our ranking (see the table on page 10).

But we have to make one thing clear: In terms of pure diesel consumption, the Volvo is not among the front runners. However, the AdBlue consumption is always included in the test, and thanks to the cooled exhaust gas recirculation of the engine, which is already Euro 6e-compliant, the AdBlue consumption is below average (four percent, based on diesel consumption).

Just as we said at the outset: Every little helps – especially against the backdrop of rising AdBlue prices. ***JB***

The coolbox is difficult to reach while driving because of the gear selector lever on the seat

A driver's truck

The Volvo FH is a real driver's truck. The noise insulation and balanced handling characteristics are just two examples of this. I consider the "partially digital" operating concept a success. The central display can be configured extensively and the touchscreen to the right of the driver has functions that do not necessarily have to be performed while driving. For cases such as these, however, Volvo still fits easy-to-operate conventional switches, which is commendable. Alternatively, many things can also be controlled using the steering wheel buttons. I still very much like the fact that you can choose between eco-roll and overrun cut-off in coasting mode with one tug on the engine brake lever.

TRUCKER tester Wolfgang Obermaier

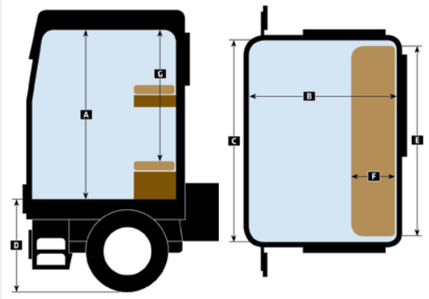
CAB RATING

Just right: Volvo's cockpit combines digital features with conventional switches

Volvo Trucks do not offer cabs with a completely flat floor. That said, the engine tunnel in all FH cabs measures just nine centimetres in height, so it is not disruptive. Material selection and workmanship are among the plus points of the cabin; the test vehicle has the largest "Globetrotter-XL" cab with a maximum interior height of 2.20 metres. The cab has a tasteful feel to it and the furniture doesn't creak or rattle, even on bad roads. The Swedish company offers a choice of several colours for the cab. Having shutters instead of hatches in front of the storage compartments above the windscreen and on the rear wall of the cabin (245 l) proves to be practical for everyday use – if you choose to order the latter as well. Volvo Trucks also offers a choice of bunks: the mattress, which is a maximum of 81 centimetres wide, is available in various degrees of firmness. We think that the firmest variant will provide your back with the best support, but this is of course always a matter of personal taste.

CAB DIMENSIONS

	(cm)
A Cab, interior height*	220
B Cab, length	222
C Cab, width	249
D Entry, height	156
Seat adjustment range, height	11.5
Seat adjustment range, depth	23
E Bottom bunk, length	200
F Bottom bunk, width	74-81
G Bunk, headroom	156
Steering wheel adjustment range, height	9
Steering wheel adjustment range, tilt	0-30°
*On engine tunnel	211



STORAGE COMPARTMENTS

Capacity in litres (l)	
Above windscreen, total with shutters	230
Optional storage compartments on the rear wall, with shutters (deepversion)	max. 245
Drawer in the instrument panel	12
Under bunk	20
Refrigerator (under bunk)	11
Outside storage compartment, top right	195
Outside storage compartment, top left	200
Outside storage compartment, bottom right	30
Outside storage compartment, bottom left	30

Four-tread step unit into the FH

SHELVES

Length x width (cm)	
Shallow tray	20 x 30
Compartment in centre console	5 l
Pull-out table	28 x 29

Folding can/bottle holder in the instrument panel, sliding and folding bottle holder by the bunk for large PET bottles, three 24-volt and one 12-volt socket, two clothes hooks, small shelves by lower bunk, narrow door shelves for documents, optional red or white night light (dimmable)

TECHNICAL SPECIFICATIONS

The tuck-away table proves useful after working hours

ENGINE

Water-cooled six-cylinder in-line engine; turbo charger with wastegate, turbo-compound turbine, SCR catalytic converter, cooled exhaust gas recirculation, particulate filter, Euro 6e

Model.....Volvo Group D13 K 500 Turbo-TC
Displacement.....12,800 cm^3
Bore x stroke.....131 x 158 mm
Compression ratio.....17.0:1
Fuel injection.....Common rail, max. 2,400 bar
Nominal power output.....500 hp (367 kW) at 1,250–1,600 rpm
Max. torque.....2,800 Nm at 900–1,300 rpm

TRANSMISSION

Clutch: pneumatically operated dry clutch, diameter 430 mm
Gearbox: unsynchronised three-speed basic transmission (Volvo Group I-Shift AT2812F), range and splitter box, 12 forward gears, 4 reverse gears.
Transmission ratio spread: 14.94 to 1.00
Reverse gears: 17.48 / 13.73 / 4.02 / 3.16
Rear axle: i = 2.31

CHASSIS

Front: 7.1 t steering axle, single-leaf parabolic suspension, weight-optimised stabiliser, medium stiffness
Rear: 12.0 t driven axle (Volvo Group RSS1244B), four-bellows air suspension, stabiliser

Tyres (on test): Front 385/55 R 22.5; rear 315/70 R 22.5
Wheels (in test): 9.00 x 22.5 aluminium (option; standard: steel)

BRAKE SYSTEM

Front: Dual-circuit compressed-air brake system, electronically controlled with disc brakes
Rear: Disc brakes, electronic brake system
Engine brake.....Volvo-Engine-Brake (VEB+): 380 kW (517 hp) at 2300 rpm
Retarder.....Optional (not connected in the test truck)

STEERING

Type.....Volvo Dynamic Steering Evolution
Gear ratio.....18.6:1
Steering wheel diameter.....450 mm

MASS + WEIGHTS

Wheelbase.....3700 mm
L x W x H.....5890 x 2495 x 3933 mm
Unladen weight...7250 kg (ready to drive, with driver)

FILL QUANTITY

Engine oil.....33.0 l (including filter)
Tank.....400 l diesel; 60 l AdBlue
Coolant.....38.0 l
Rear axle/gear oil.....11.0 l / 16.0 l

COMPETITION

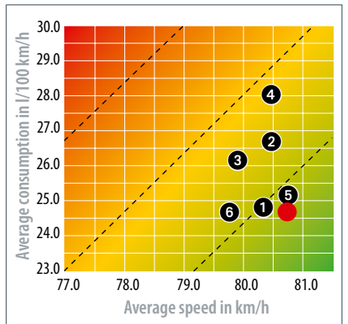
Volvo FH 500 TC	
Driver rating	844
Economy	598
Consumption (w. AdBlue)	24.6
Speed	80.7
Points	**1442**

MAN TGX 18.510	
Driver rating	843
Economy	589
Consumption (w. AdBlue)	24.7
Speed	79.7
Points	**1432**

MB ACTROS 1851	
Driver rating	818
Economy	565
Consumption (w. AdBlue)	26.3
Speed	80.2
Points	**1383**

SCANIA 500 S SUPER	
Driver rating	845
Economy	592
Consumption (w. AdBlue)	24.9
Speed	80.4
Points	**1437**

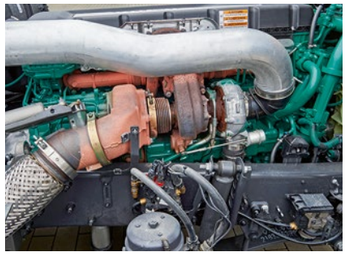
CONSUMPTION COMPARED



1 Scania 500 S Super
2 Volvo FH 500 I-Save (predecessor model)
3 MAN TGX 18.510 GM
4 MB Actros 1863
5 Scania 560 S Highline
6 MAN TGX 18.510 GX
● Volvo FH 500 I-Save

SERVICE AND MAINTENANCE

The turbo-compound technology requires more technical effort, but the I-Save package does not have higher maintenance requirements or shorter service intervals, according to Volvo Trucks. Depending on use, the on-board



Turbo-compound turbine on engine's right side

computer requests a workshop visit at the latest after 150,000 kilometres or once a year. The Swedes are going the distance in terms of compressed-air cooling. Instead of the usual cooling coils, the air flows through a fan ring placed around the main fan before being directed to the compressed air modulator. The optional full-LED lighting is as fail-safe as it is luminous, and we certainly recommend it.

TEST ROUTE

Klimaneutral Transport
ClimatePartner.com/11232-1306-1001

Setting a good example:
TRUCKER compensates for the CO_2 emissions of its testing by means of certificates. The compensation is fed into a wind-energy project through the contractor ClimatePartner. We owe that to the environment – even when we are driving to help you save!

The air-conditioned leather seats are optional

CONSUMPTION AND SPEED

Tonnage 40 t each	1st leg 74.3 km Medium	2nd leg 80.8 km Hilly	3rd leg 100.2 km Rolling leg	4th leg 50.5 km Country road	5th leg 37.0 km Easy	Total 342.8 km
Litres per 100 km	23.31	26.37	25.07	23.22	24.43	24.65
km/h	85.85	84.61	84.53	62.67	85.32	80.75

SCORES

	Gradient/length	Time	Gear at rpm	v_{min}	Consumption
1	Max. 5%, 1.5 km	1.15 min	11 at 1050 rpm	66 km/h	72.0 l/100 km
2	Max. 6 %, 1.5 km	1.10 min	11 at 1100 rpm	72 km/h	73.3 l/100 km
3	Kinding hill on A9	3.33 min	11 at 1100 rpm	71 km/h	84.0 l/100 km

Testing by reference

Every test is accompanied by our 38-tonne reference vehicle, an MB Actros 1845 pulling a Schmitz-Cargobull curtainsider. We have gathered fuel-consumption data under good conditions with this. If the data changes during the test, we know that the test truck was subject to different conditions. By calculating the ratio of change, we are able to analyse the data of the test truck on a standardised basis. The advantage: our data is comparable. We think it would not be legitimate to compare data gathered with no reference under varying conditions. We are the only trade journal to test using a reference truck. This is also the method practised by the industry. AdBlue consumption is calculated into the individual leg results on a pro-rata basis.

NOISE MEASUREMENTS COMPARED

Measurement in dB(A)	**Engine on** Idling	**85 km/h** Roof hatch closed	**65 km/h** Roof hatch closed
Volvo FH 500 I-Save	**51**	**63**	**60**
Best in test *3	48*4	61	62*5
	Uphill	**Full throttle**	**Engine brake running**
Volvo FH 500 I-Save	**67**	**64**	**66**
Best in test *3	62	62	60

*3: Scania S 730, *4: Volvo FH 460, *5: Volvo FH 500 I-Save

SCORES

Engine (max. 140).....133
Gearbox (max. 140).....128
Brakes (max. 120).....100
Steering (max. 40).....35
Pedals (max. 20).....16
Handling (max. 60).....50
Visibility (max. 50).....42
AC/ventilation (max. 50)..40
Seats (max. 40).....33
Instruments (max. 50)..42
Windscreen washers (max. 30).....24
Cab (max. 240).....201

Total points:.....**844**
(maximum .....980)

+ Despite torque reduction in Eco mode, good mileage, low consumption, high comfort, low noise level

− Position of the I-Shift selector lever, comparatively cramped large cabin, coolbox difficult to reach while driving

CONCLUSION

TRUCKER tester Jan Burgdorf

The 500 I-Save deals supremely well with the 40 tonne weight, thanks to the additional turbo-compound power. In terms of torque, it outstrips even the more powerful 540 hp setting by 200 Nm, for which the I-Save package is not available. Therefore, you can do without the 540 and invest the money saved in the large Globetrotter XL cab plus accessories instead.

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