

VOLVO

B10M



No engine at the front ...

Many types of passenger service require a bus with plenty of space at the front, there's no room for a bulky engine here! This must be an open and efficient passenger area, possibly suitable for OMO, with twin entry doors ahead of the front axle.

There are plenty of buses like this. However, they are rear-engined, which is not always the best solution.

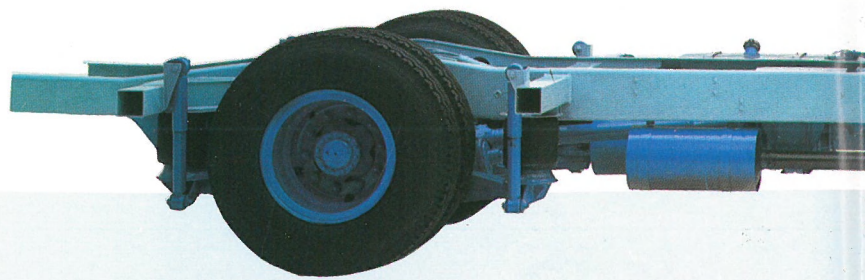


No engine at the rear!

Most bus manufacturers consider that the best solution is to fit the engine at the rear. This makes the bus tail-heavy, and a tail-heavy bus is not a safe bus, not a bus for long distance use. In the case of tourist coaches, there is another reason for not specifying a rear engine. A tourist coach should have a large, spacious luggage compartment at the rear, quite simply because there is no other equally suitable place in a coach for a convenient and spacious luggage compartment if, simultaneously, you want the best possible road-holding. If requirements call for an uncomplicated and reliable articulated bus, then the rear-engined versions are out of the question.



This is where the

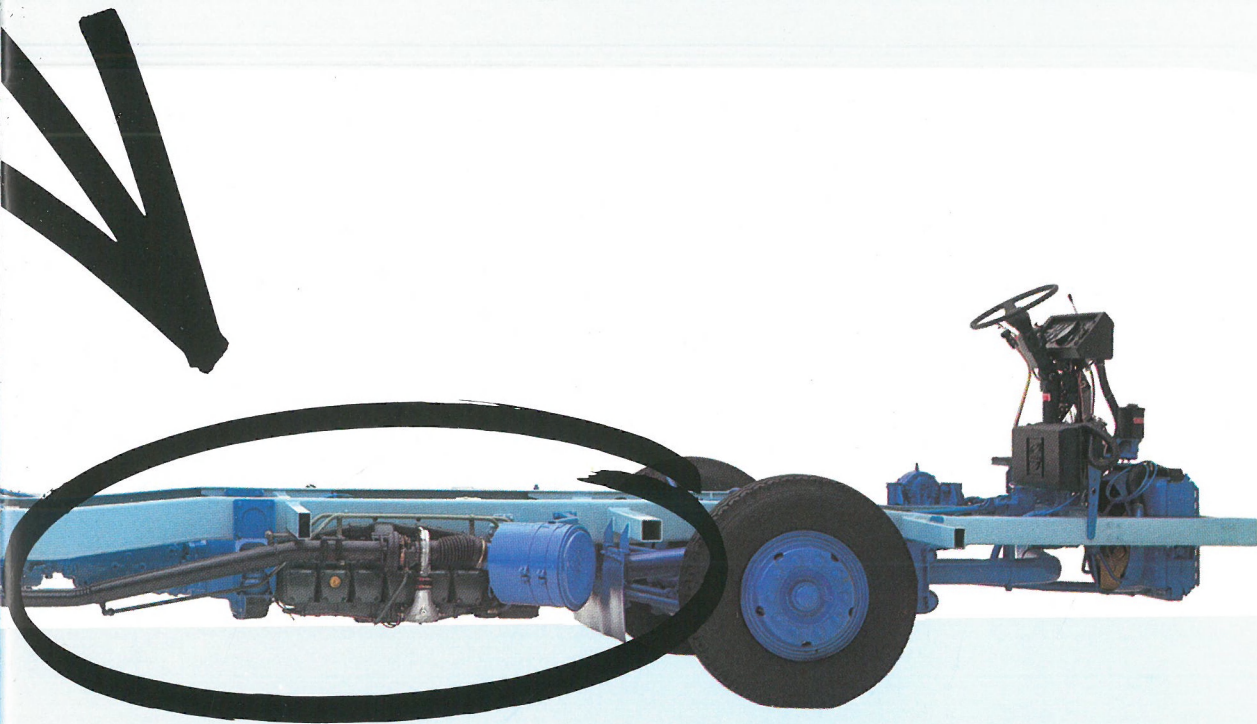


In the

The secret behind one of Volvo's biggest bus-successes ever is the mid-underfloor engine. In this position, it gives an ideal distribution of weight. Installed horizontally, and entirely under the floor, it does not intrude on the passenger area. And it is ideally accessible for service.

The Volvo bus programme has incorporated a mid-engined chassis ever

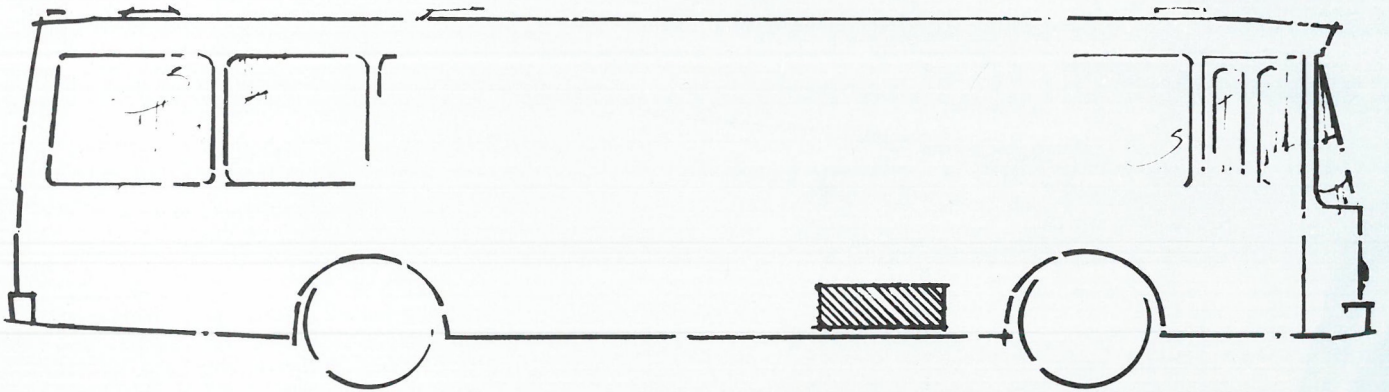
B10M has its engine.



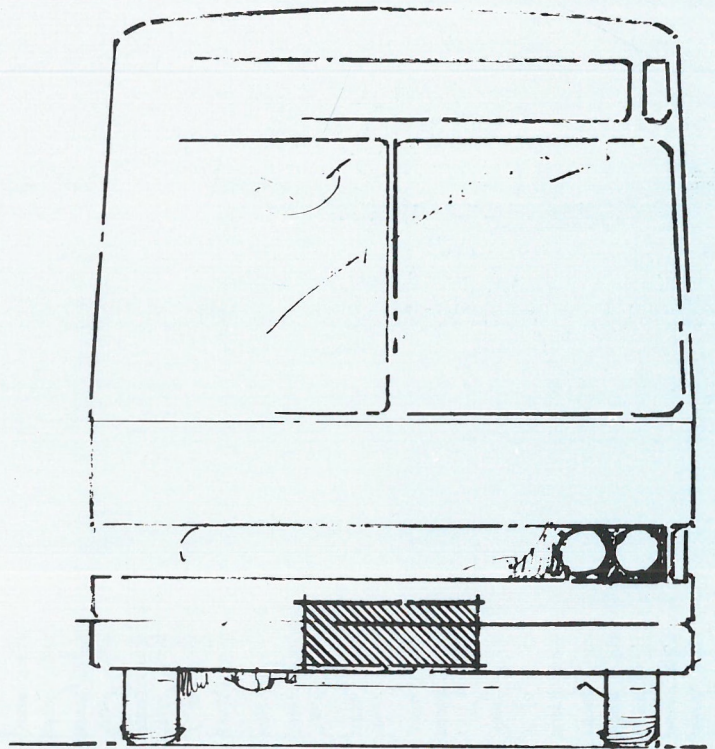
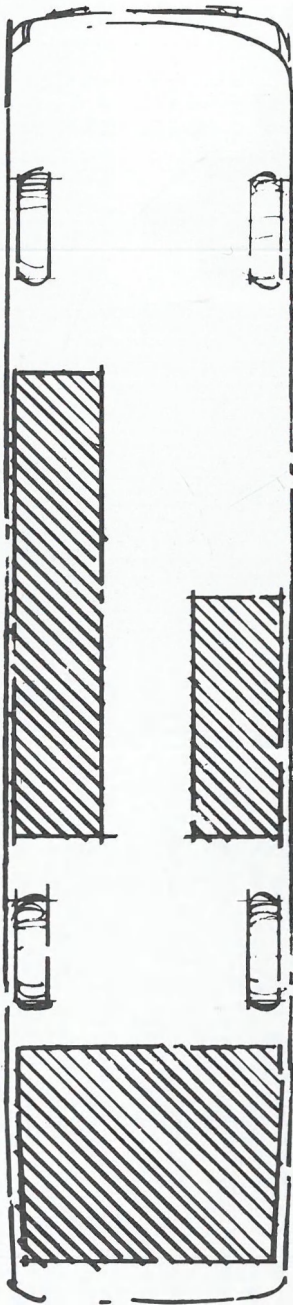
middle!

since 1951. This design has proved its worth over the years through excellent sales results: up to now, Volvo has delivered more than 25,000 mid-engined chassis. The mid-engine principle is the same today as it was in 1951 although the techniques involved have of course been refined step by step. And here is the best ever version – the Volvo B10M.

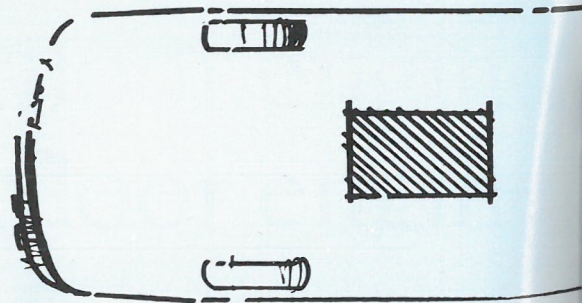
The mid-underfloor engine



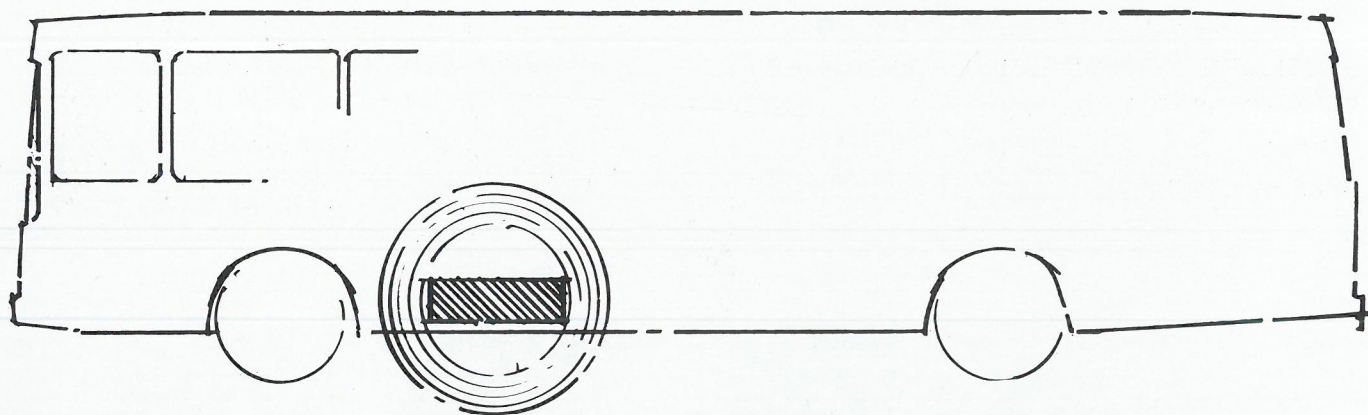
No other engine installation gives such perfect balance. Whether the B10M is empty or fully loaded, the centre of gravity is in the middle. Which means that the Volvo B10M has superior road-holding properties – an essential advantage when driving at high averages on major routes, or when conditions are slippery and treacherous.



The engine compartment is entirely separate from the passenger area. This leaves the interior of the bus entirely free for maximum utilization of floor space.

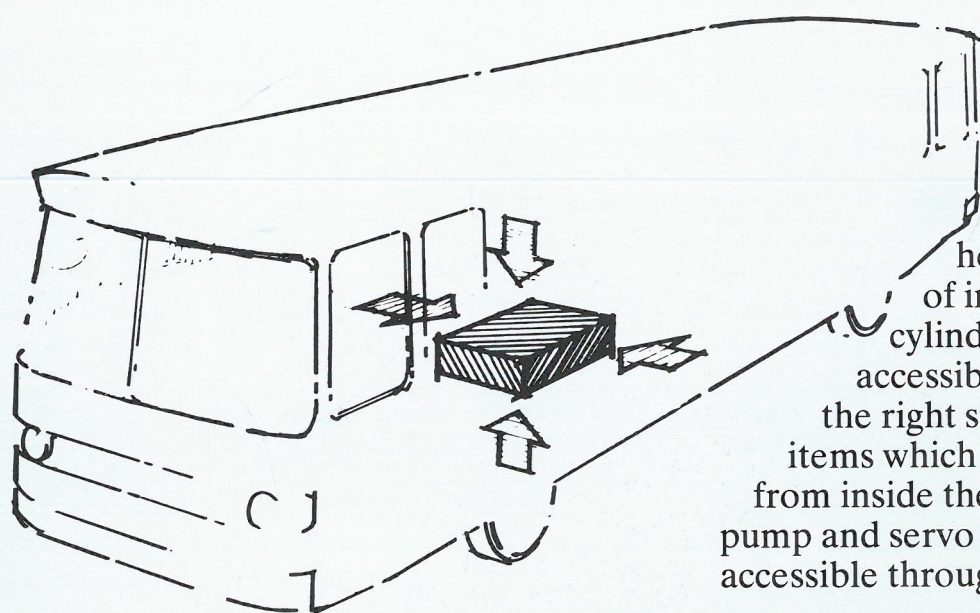


gives many benefits.

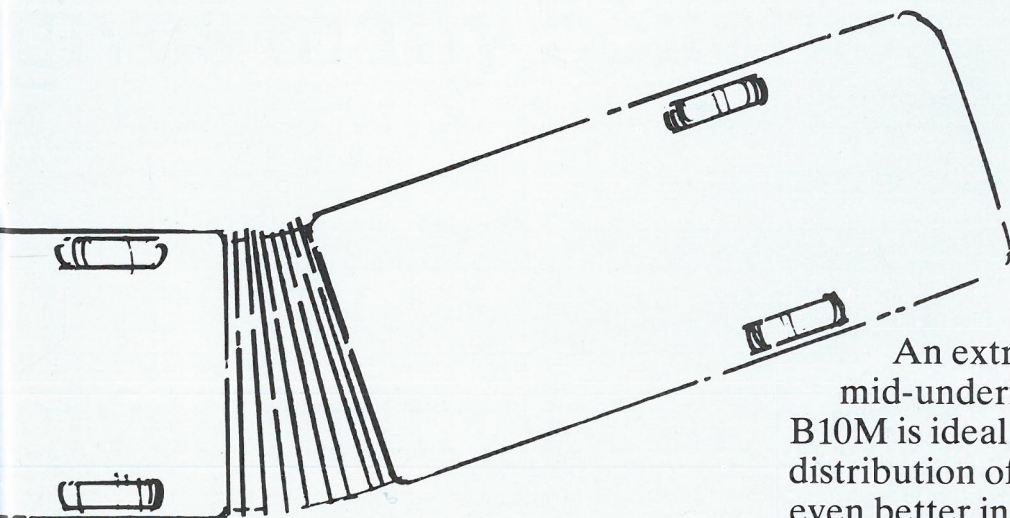


With this type of design, it is also much easier to provide efficient noise insulation between the engine and

passenger area. The B10M is an excellent chassis on which to build a very quiet bus.



The engine can be reached from various directions. From underneath. From the sides, through hatches in the body. Being horizontally installed and of in-line type, all of the cylinder heads are directly accessible from the hatches on the right side of the bus. The only items which need to be reached from inside the bus body are the fuel pump and servo pump which are easily accessible through a hatch in the floor.

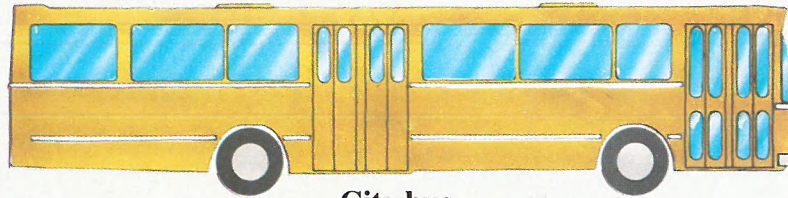


An extra benefit created by the mid-underfloor engine is that the B10M is ideal as an articulated bus. The distribution of weight is, if possible, even better in an articulated, six-wheeler version of the B10M

The versatile chassis.

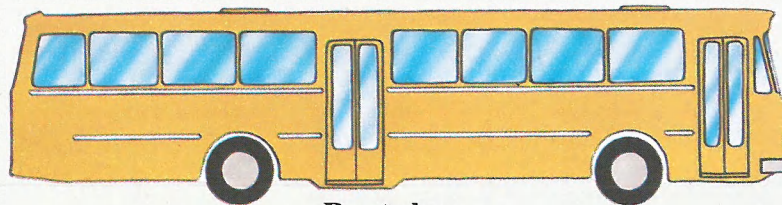
The mid-underfloor, horizontal location of the engine gives benefits which are particularly evident on long-distance and tourist routes. However, ever since the very first mid-engined Volvo bus was introduced in 1951, this layout has

also been very popular for a number of other applications. Operational reliability and economy together with the obvious benefits offered by the entirely uncluttered floor space are features which every bus operator appreciates.



City bus

The mid-engined bus has proved to be ideally suited to urban public transport. The Volvo B10M can be fitted with large capacity doors anywhere along its sides, and its transmission options are ideal for this type of work. Its power output is ample for fast acceleration, even when starting uphill.



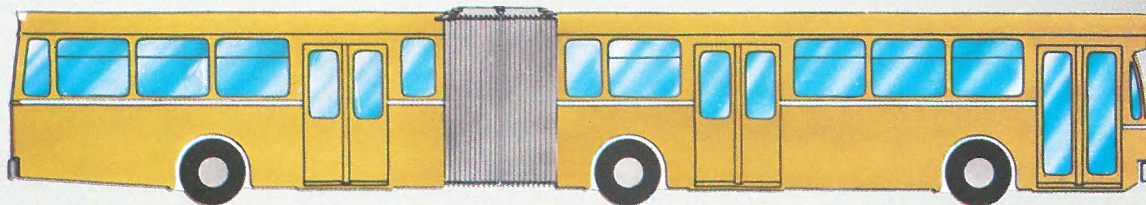
Route bus

On the open road, the Volvo B10M comes into its own. The ideal distribution of weight gives the bus excellent balance and makes it safe and easy to drive. The transmission alternatives offered give a suitable combination of starting effort and maximum speed to suit a wide variety of roads.



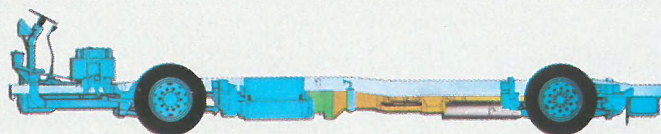
Tourist coach

With the inherent roll stiffness of its air suspension, the B10M gives a very good ride. In addition to good balance and directional stability, the underfloor location of the engine makes for passenger convenience and an efficient luggage compartment.



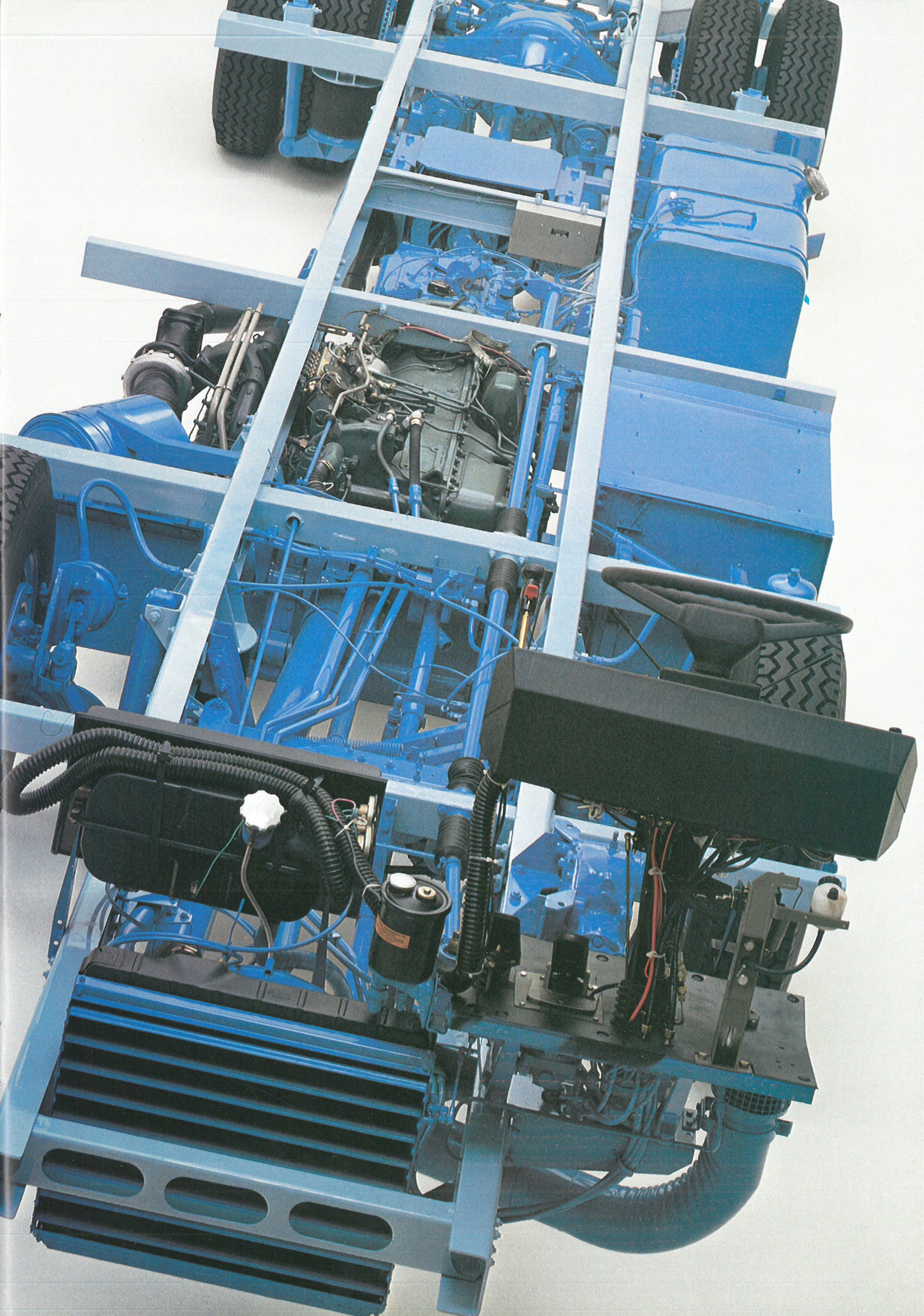
Articulated bus

Few articulated bus chassis on the market today are as ideal for their purpose as the B10M. Every single component is dimensioned to satisfy with a wide margin the higher vehicle combination weight and the approximately 50% increase in passenger capacity.



Special versions

For those who seek a chassis for a special vehicle, there is every reason for taking a good long look at the B10M. In questions of space and distribution of weight, the mid-underfloor engine gives the designers a great deal of scope. Other reasons for basing special versions on the B10M include the wide range of options and the proven reliability.

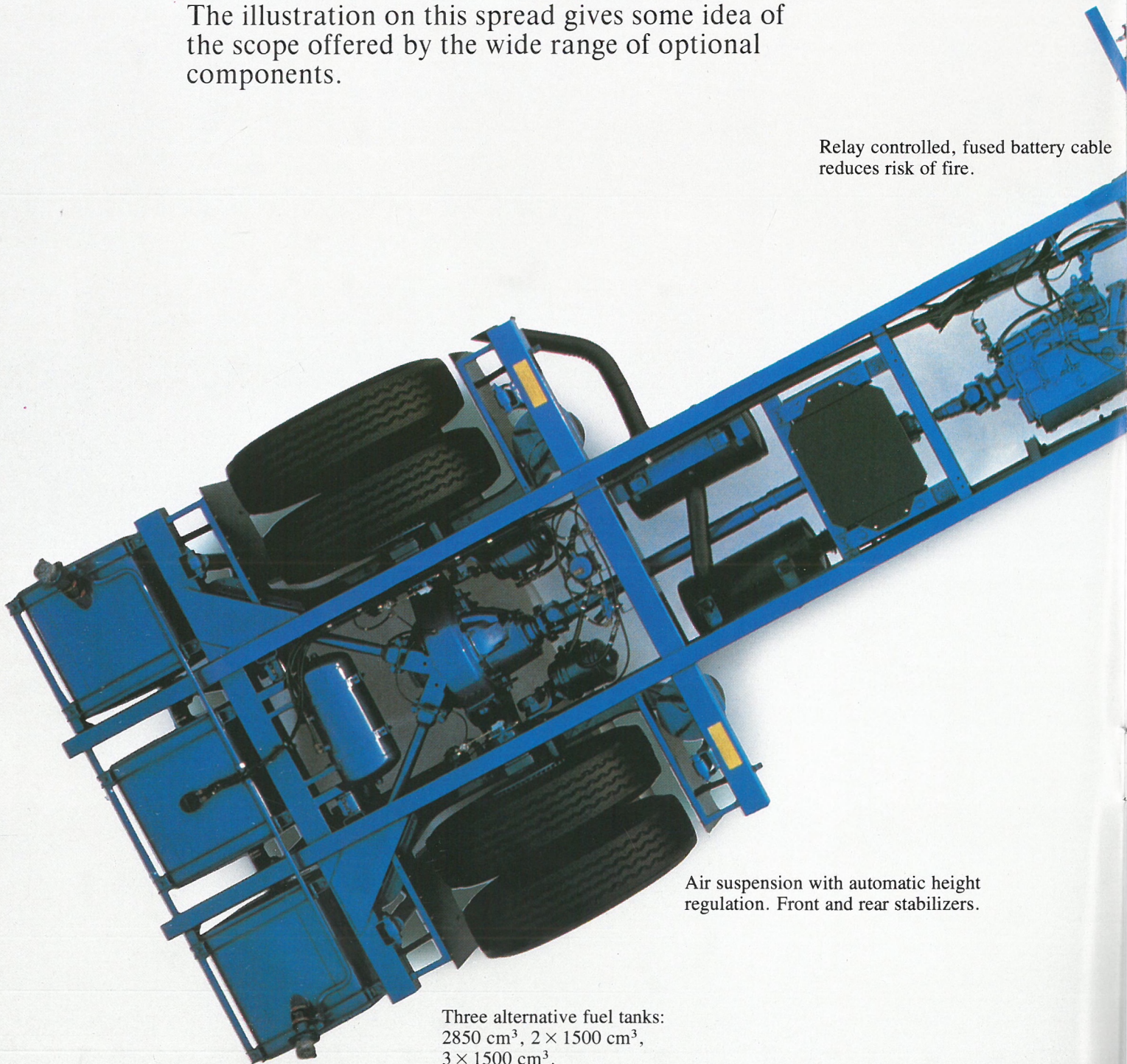


How an all-round chassis becomes a Special.

Experience gained from the many predecessors of the B10M has shown that this is the all-round chassis which combines the best operational economy and payoff potential for a great many types of use. The competitiveness of the B10M in a wide range of jobs comes fundamentally from its unusually comprehensive programme of optional components. The B10M is designed to offer complete combinations for many types of operation.

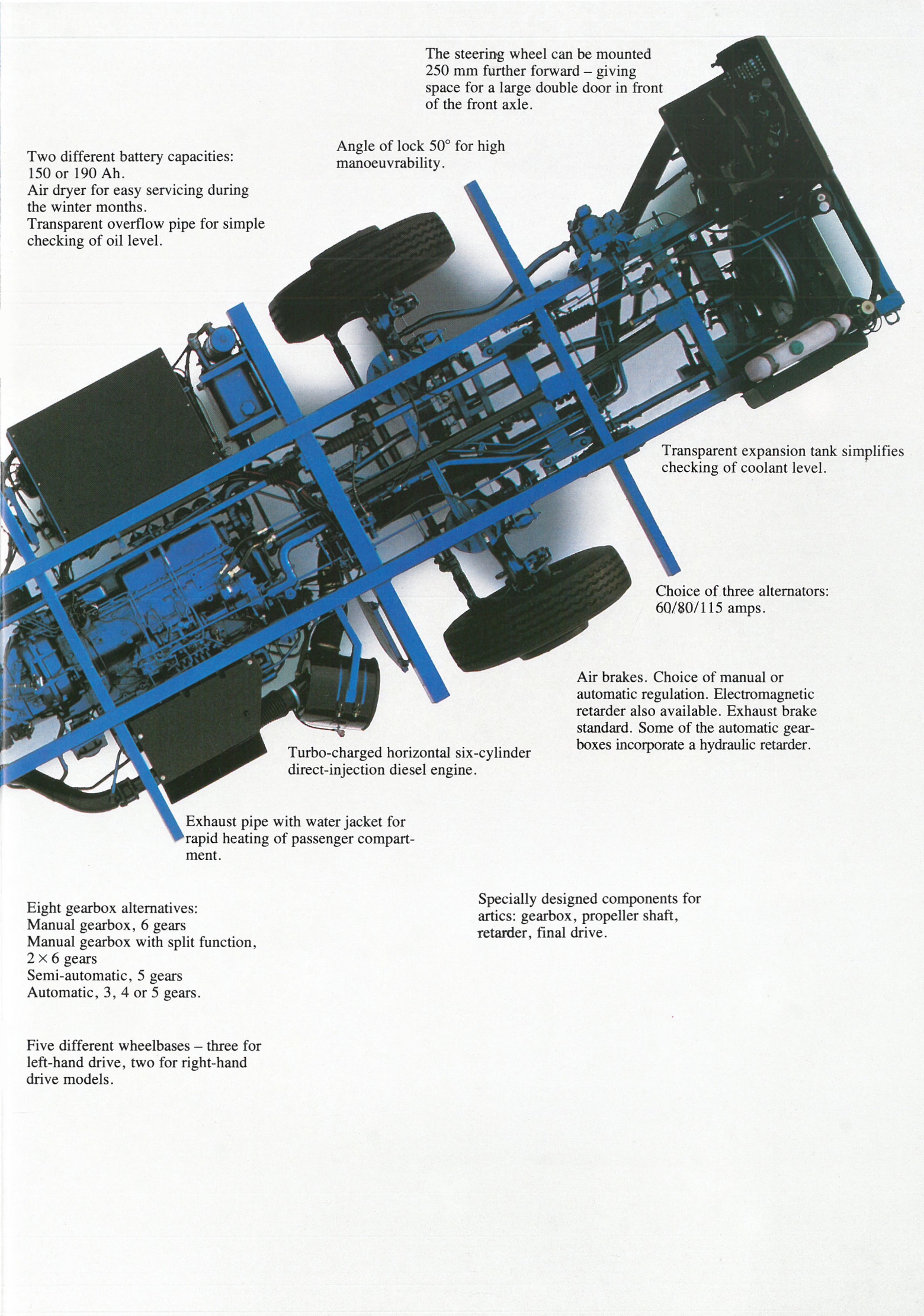
The illustration on this spread gives some idea of the scope offered by the wide range of optional components.

Relay controlled, fused battery cable reduces risk of fire.



Air suspension with automatic height regulation. Front and rear stabilizers.

Three alternative fuel tanks:
2850 cm³, 2 × 1500 cm³,
3 × 1500 cm³.



The steering wheel can be mounted 250 mm further forward – giving space for a large double door in front of the front axle.

Two different battery capacities:
150 or 190 Ah.
Air dryer for easy servicing during the winter months.
Transparent overflow pipe for simple checking of oil level.

Angle of lock 50° for high manoeuvrability.

Transparent expansion tank simplifies checking of coolant level.

Choice of three alternators:
60/80/115 amps.

Air brakes. Choice of manual or automatic regulation. Electromagnetic retarder also available. Exhaust brake standard. Some of the automatic gearboxes incorporate a hydraulic retarder.

Turbo-charged horizontal six-cylinder direct-injection diesel engine.

Exhaust pipe with water jacket for rapid heating of passenger compartment.

Eight gearbox alternatives:
Manual gearbox, 6 gears
Manual gearbox with split function, 2 × 6 gears
Semi-automatic, 5 gears
Automatic, 3, 4 or 5 gears.

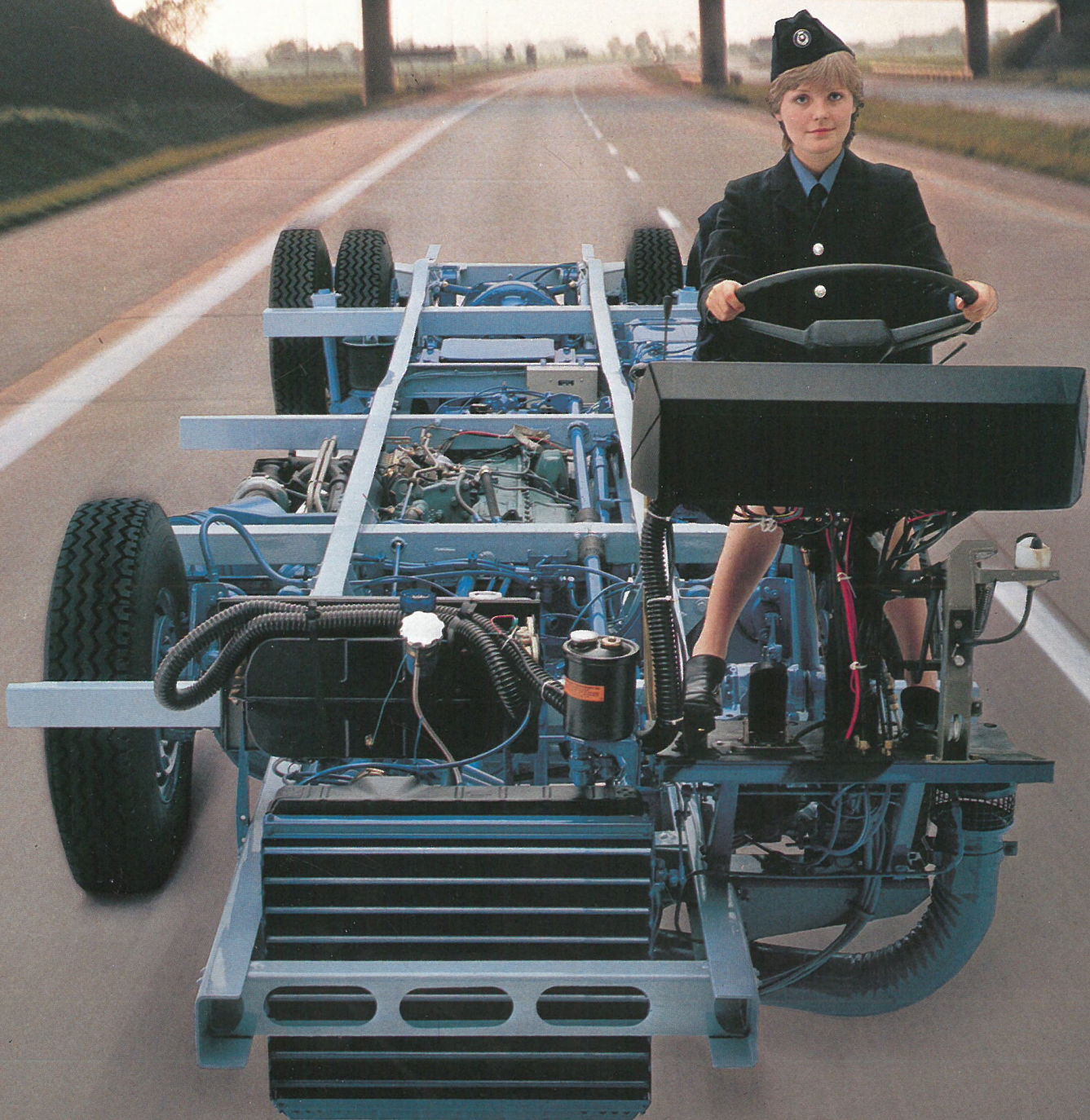
Specially designed components for artics: gearbox, propeller shaft, retarder, final drive.

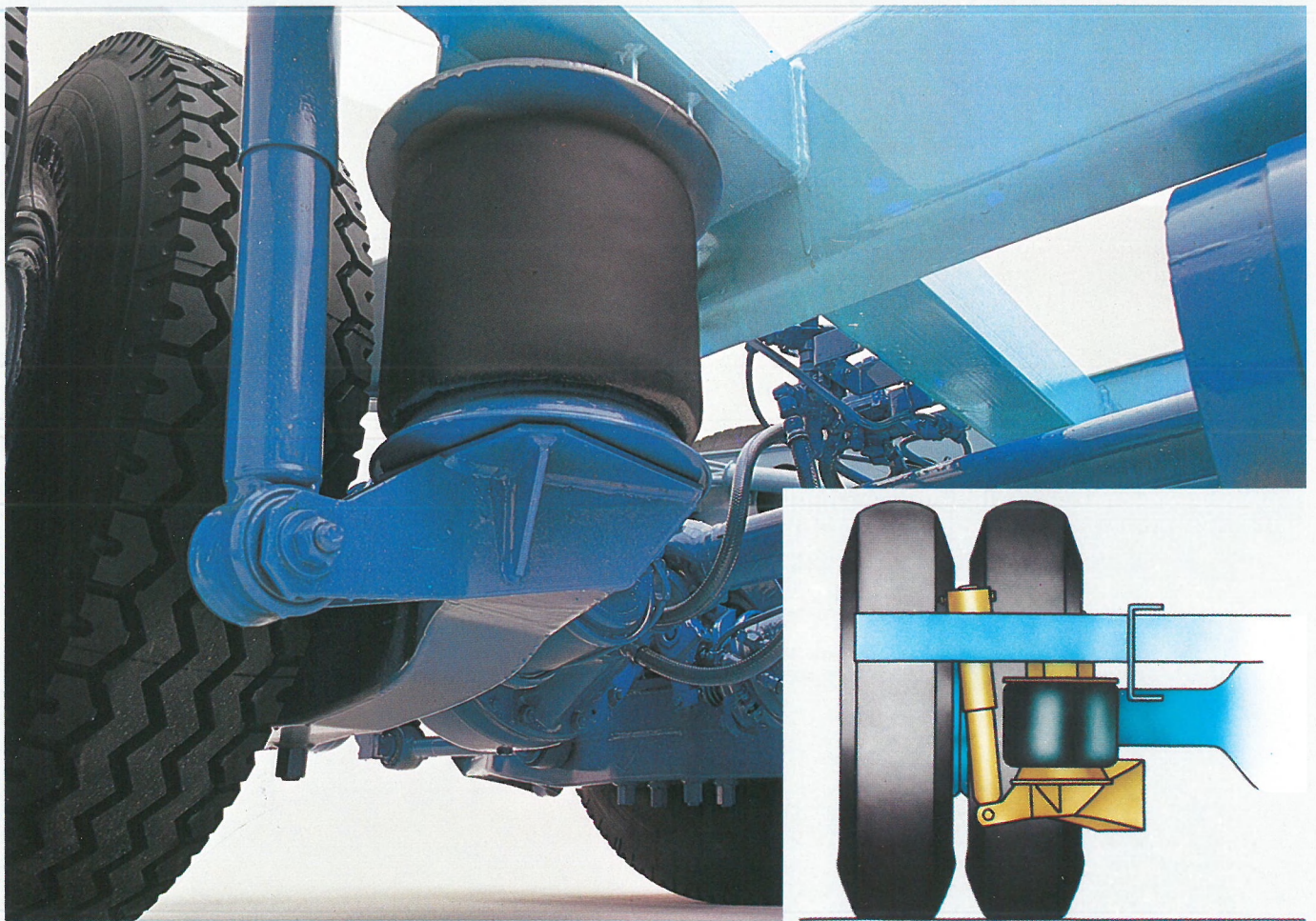
Five different wheelbases – three for left-hand drive, two for right-hand drive models.

Engineered to work together

Understandably, the most interesting thing to the bus buyer is not the individual performance of each component, rather their combined result in the bus. There's no point in having a high output engine if a significant part of the power disappears on its way to the rear wheels because the engine, transmission and final drive are not the best match.

The B10M is available with an unusually large selection of alternative components. On the basis of this component programme, Volvo has built up a number of combinations which are based on their engineering compatibility and their ability to give the very best results in the type of work for which are designed. These combinations have been endurance tested on the Volvo proving grounds as well as in real life. Whichever version of the B10M you choose, you are assured of a chassis which incorporates components that have been designed to work together.





Stability and comfort

The B10M has air suspension exclusively. Roller bellows incorporating rubber buffers to prevent bottoming give an extremely comfortable ride, smooth and level. The air bellows are of outboard type, being located far out from the vehicle centreline. They are combined with stabilizers.

The B10M can also be specified with leaf springs – either conventional or taper. Both types give a very good ride thanks to their length – so good, in fact, that many operators prefer leaf springs for their tourist coaches.

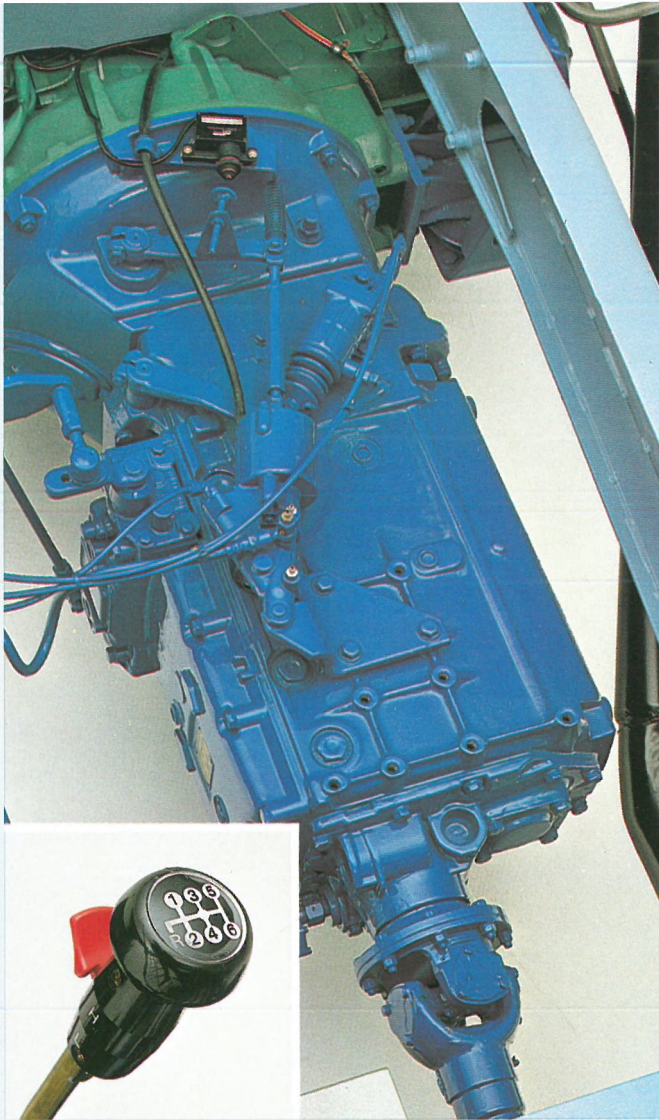
The superior properties of the mid-engined bus also give good balance and stability even in heavy side winds.

Power and speed.

The B10M has a horizontal, in-line six-cylinder turbo-charged diesel mounted between the frame members, almost exactly in the centre of the chassis. Direct injection and turbo-supercharging result in almost unbeatable fuel consumption. Many owners report fuel consumption lower than 2.5 litres per 10 km on long distance routes which is about half a centiliter per passenger kilometer!

Engine displacement is 9.6 dm³. Thanks to efficient use of turbo technology, power output is as high as 180 kW (ISO 2534). This is very ample, even to power a fully loaded B10M articulated bus at high speeds on main road routes. A 133 or 203 kW (ISO 2534) engine alternative is also available.

Ample power and good fuel economy are not the only benefits of the Volvo turbo-supercharged engine, it also gives cleaner exhaust gases and makes less noise. A Volvo turbo-supercharged engine also maintains its performance at high altitudes.



Power assisted clutch

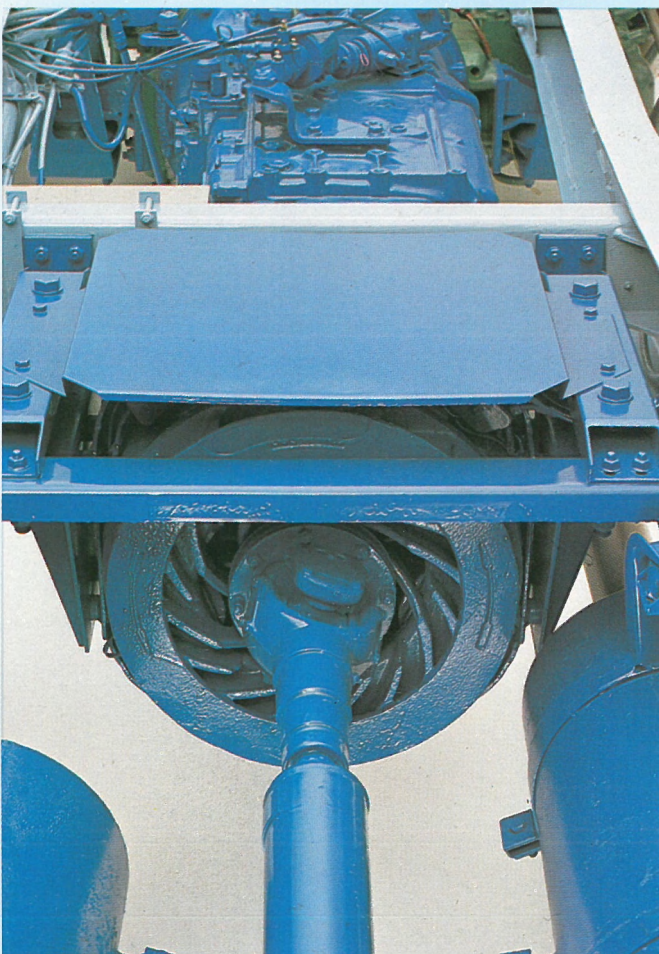
The clutch is power assisted and therefore the required pedal load is not much more than needed in a car.

Eight different gearboxes

The manual, basic gearbox is a six-speed unit and fully synchronized. The ratios are evenly divided, from the lowest to the highest.

This basic gearbox can be combined with a splitter unit which doubles the number of ratios giving 12 speeds. The ratio steps between the eight highest speeds are only 20% which means the driver can always select the correct gear to suit any incline or occasion. Shifting between the Low and High ranges is by means of a conveniently used toggle switch mounted on the gear lever.

There are not less than six different automatic transmissions for the B10M – three-stage and four-stage automatics for four-wheeler versions, and two five-stage alternatives for the articulated versions. All of these automatic transmissions have a hydraulic torque converter and some also have a hydraulic retarder.



Eddy-current propeller shaft retarder.

A retarder can be fitted between the gearbox and the final drive. This can take over most of the braking work, thus significantly increasing the mileage of the service brakes. It is extremely smooth-acting and makes an important contribution to road safety on hilly roads.

Final drive

The final drive is a heavy-duty single reduction gear of hypoid type. It is available in two versions – EV80B with a 16.5" crownwheel for the four wheeler versions, or the EV85B with an 18" crownwheel for articulated buses.

A differential lock is offered as an optional extra.



Steering and Brakes

One of Volvo's specialities is the jointed steering column making it possible to combine a driver's seat positioned far forward in the vehicle with a steering wheel set at a very comfortable angle – a full 27 degrees. The steering gear is of the ball-nut type with an integrated servo mechanism.

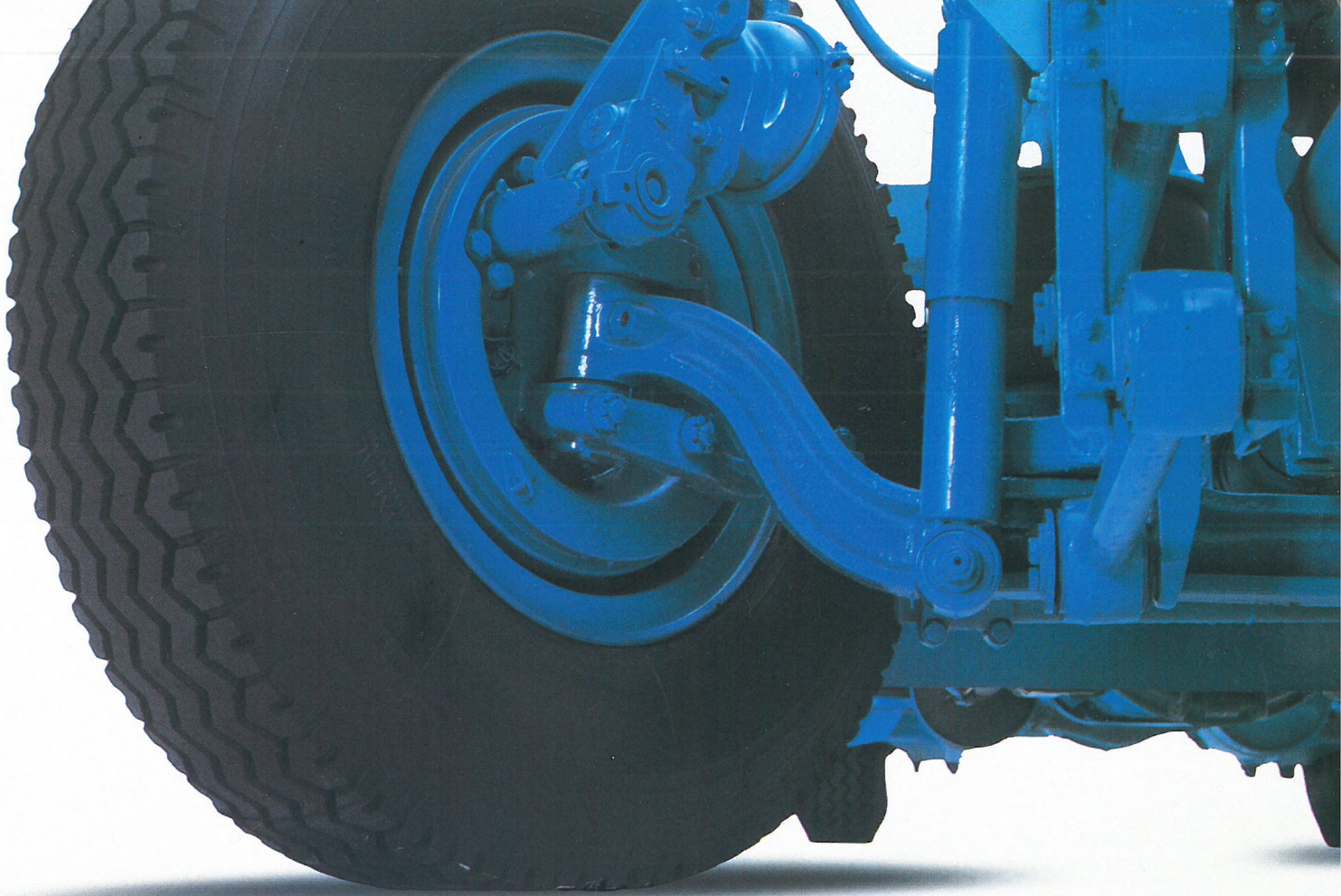
The servo function is designed so as to allow the driver to feel he still has direct contact with the road, and the steering ratio is such that the bus can be steered entirely by hand should the servo system fail. Five turns of the steering wheel are needed for full lock. The angle of lock is 50° with air suspension and 45° with leaf spring suspension.

The compressed air system of the B10M incorporates three completely separate circuits for the brakes, governing the front axle, the rear axle and the parking brake, and a further circuit for the rest of the compressed air equipment.

The service brakes have a very large friction area. In the articulated version with a steered rear axle, the first and third axles have the same type of brake, simplifying parts availability and facilitating maintenance. Brake regulation is automatic. The parking brake also functions as an emergency brake, coming on automatically if the air pressure sinks below a given level. If an attempt is made to start with the system empty, the parking brake cannot be released until the service brake has built up to full pressure. The exhaust brake, provided as a standard feature, helps to extend the working life of the service brakes.

An air dryer comprising a special insert, which should be changed annually, keeps the compressed air system free from the moisture which might otherwise cause corrosion or the formation of ice.





Instruments

The instrument panel and instrument faces are matt black to prevent reflections. Markings are white, but some colour is used to help at-a-glance read-off. The tachometer, for example, features a green field showing the speeds at which the engine will combine the greatest tractive effort with optimum fuel economy.

In order to facilitate all-round monitoring, all warning lights pertaining to safety functions are connected to a single large central indicator which they share in common. When this comes on the driver can refer to the individual lights to see what the warning is about. All warning lights are provided with internationally-used graphic symbols.







B10M Tourist Coach.

The very fundamentals of the B10M chassis make it ideal for a tourist coach. The low centre of gravity thanks to the horizontal underfloor engine, which makes the B10M a quiet coach too, gives a balance and distribution of weight that comes to its best on fast routes. The chassis layout gives an unusually large luggage compartment in the tail of the vehicle and with its air suspension, reliability and excellent overall economy, the B10M is perfect for the long-distance routes.





The B10M Articulated Bus

All over the world there is a tendency for staff and personnel costs to rise more rapidly than the cost of the actual transport hardware, and interest in artics is therefore on the increase in a number of countries. Two men each driving an artic can transport as many passengers as three men driving three standard-type buses.

Volvo introduced its first artic very early on and today has accumulated a large body of material based on its long experience of this type of bus showing that the operating costs associated with the extra passenger capacity are more or less negligible. The whole basic design of the B10M allows an adequate margin for the greater total weight of the articulated



version, and there is no measurable difference between the wear on the engine, transmission and other components of the B10M artic and that observed in the B10M standard bus.

In addition, the B10M has the performance to match the greater overall weight of the artic – there are well-tried combinations of engines, gear-boxes and final drives especially adapted to the articulated version.

It goes without saying that from the service and maintenance angle it is well worthwhile running both two-axled and three-axled B10Ms in the same fleet. Standardization of components makes it easier to keep tabs on stocks of spares and facilitates the training of maintenance personnel.

A few words about service

Few things are so destructive to economy as an unscheduled stoppage. These can be avoided in a number of ways: by a proven design, by a design which facilitates service and by the manufacturer really endeavouring to compile efficient service routines and make sure that the bus owner has close access to parts and service.

The Volvo B10M is outstanding in all of these areas. Its operational reliability has been proven by the more than 25,000 mid-engine buses already built by Volvo. A look through our workshop manuals and general workshop publications will convince you of just how well our service methods are planned.

Study the B10M and you will find a number of features which are proof that Volvo service engineers have had more than a word in its design.

A few examples:

The engine is easily accessible from underneath, from the sides and from above.

The steering box is also easy to reach – it is mounted on the frame, free-standing from the steering column.

The battery box is of draw-out type for easy checking and topping-up. The engine air cleaner and lubricating oil tank are positioned along the flanks of the bus for convenience.

All electrical cables are run in protective conduits and have plug-in connections.

Automatic fuses are optional.

The relays are of plug-in type and are fully interchangeable.

The electrical system is based on printed circuits with a distribution centre.

Put service issues at the top of your list when deciding on a bus. In principle, a bus at standstill is no bus at all. The Volvo B10M is a bus you can trust, a bus that keeps going with utter reliability. A great many mid-engined Volvo buses have clocked up 500,000 kilometers and more without a major overhaul and there are even some that have run one million kilometers in very difficult conditions without problem!







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