
THE AILSA B55



**THE
VERSATILE
DOUBLE
DECKER FROM
VOLVO BUS (GB)**

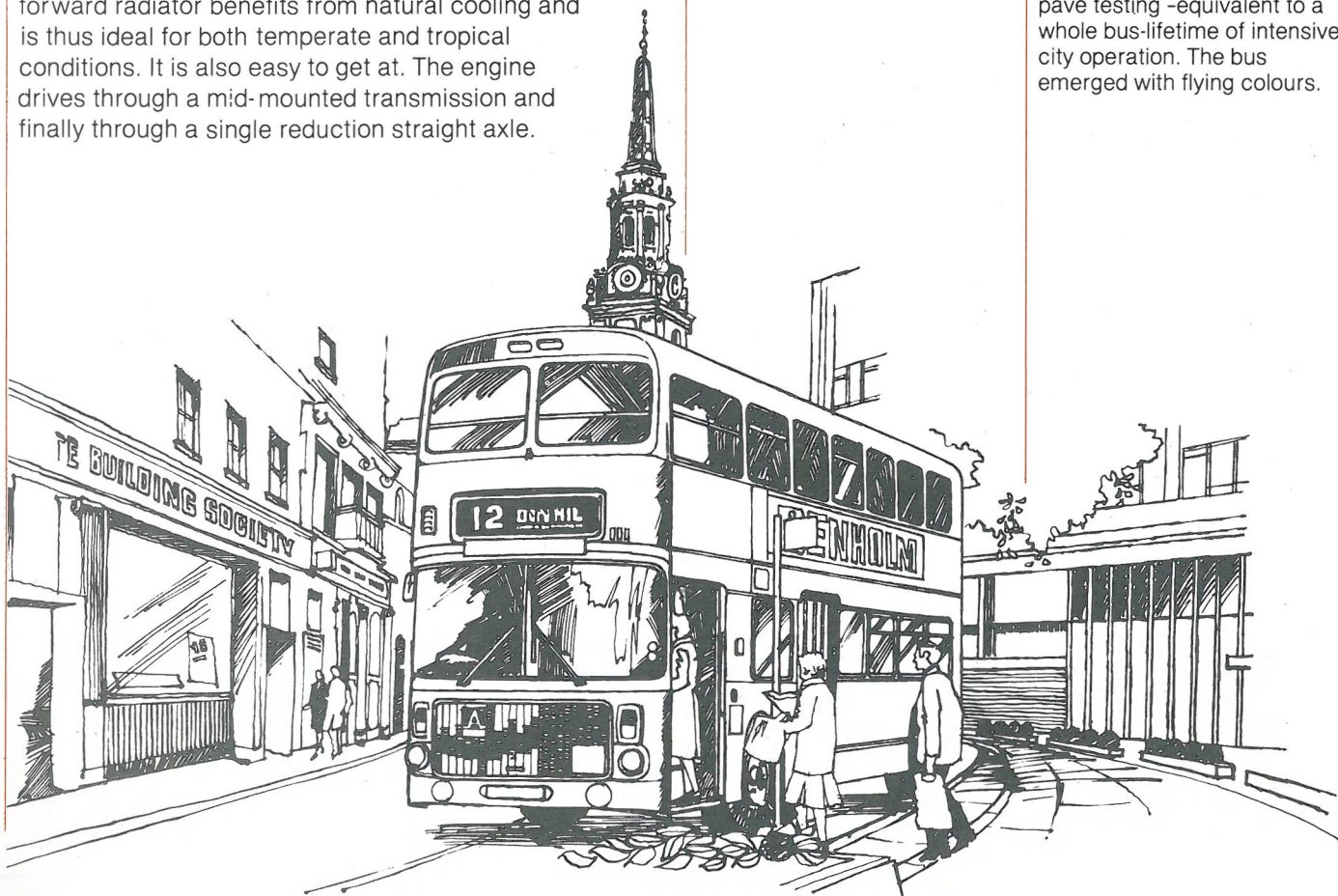
The real Alternative

The Ailsa B55 (Volvo B55 for export) is a simple trouble-free bus that combines the advantages of a front engine with a full-size passenger door ahead of the front axle. It provides a real alternative to complicated rear engined buses.

Designed, with the assistance of operators, in the seventies, it is built for intensive city bus operation and yet is simple both to operate and maintain.



The compact front-mounted engine with forward radiator benefits from natural cooling and is thus ideal for both temperate and tropical conditions. It is also easy to get at. The engine drives through a mid-mounted transmission and finally through a single reduction straight axle.



Volvo in Britain

The Ailsa bus is a British concept, designed and built in the Volvo Bus (GB) factory at Irvine in Scotland. With the exception of the engine the underframe is built almost entirely from British material and when bodied, approximately 90% of the total material content is of British origin. Our parent company, AB Volvo, has declared a policy to invest heavily in the UK, and in 1980, for example, the Volvo Group of companies purchased more than £125 millions worth of components from Britain.

As a general guide, the 30,000 heavy trucks, 5,000 buses and 300,000 cars that Volvo produce, have a 40% UK material content.

Within the United Kingdom over 10,000 people are employed in the manufacture, distribution and servicing of Volvo Group products.

Volvo, a name for quality & safety

Attention to detail and safety is a well-known tradition of Volvo products and the Ailsa bus is no exception to this. The underframe is of box section steel and is all welded. It is extremely strong and the perimeter frame construction has an excellent resistance to side impact. Passengers travel in safety on an Ailsa bus.

Volvo's total commitment to vehicle safety was emphasised in the long and intensive proving period that followed the build of the first prototypes, when the vehicle successfully completed the gruelling MIRA 1,000 hour pavé testing -equivalent to a whole bus-lifetime of intensive city operation. The bus emerged with flying colours.

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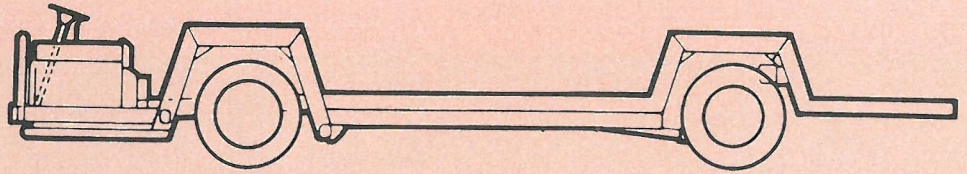
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The Bus Range

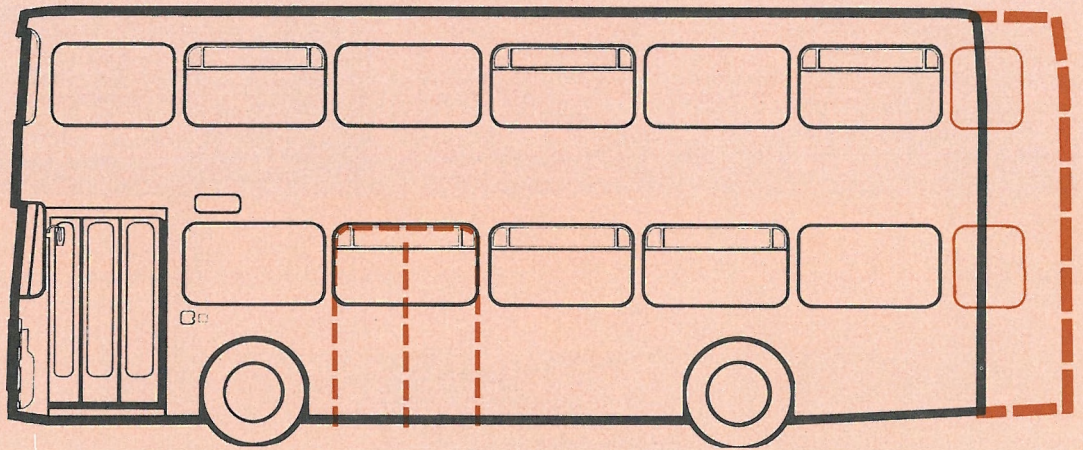
Built to offer the most appeal to the operator, the Ailsa bus is available in a variety of lengths and wheelbases.



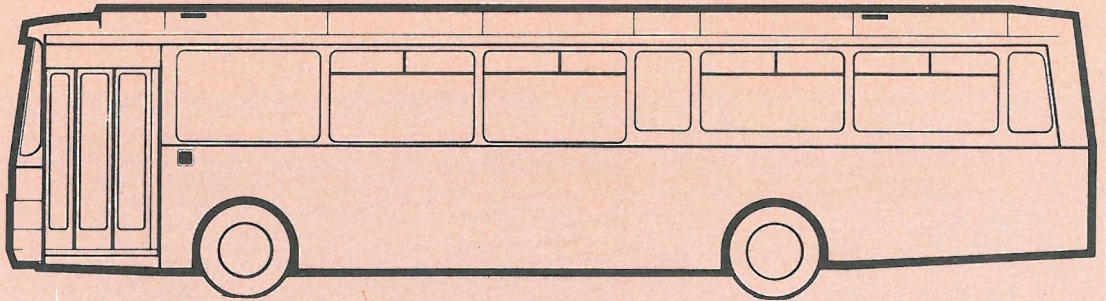
Starting point of the range – 9.8 metre underframe

9.8 metre single door double deck, with 79 seats. Centre exit option.

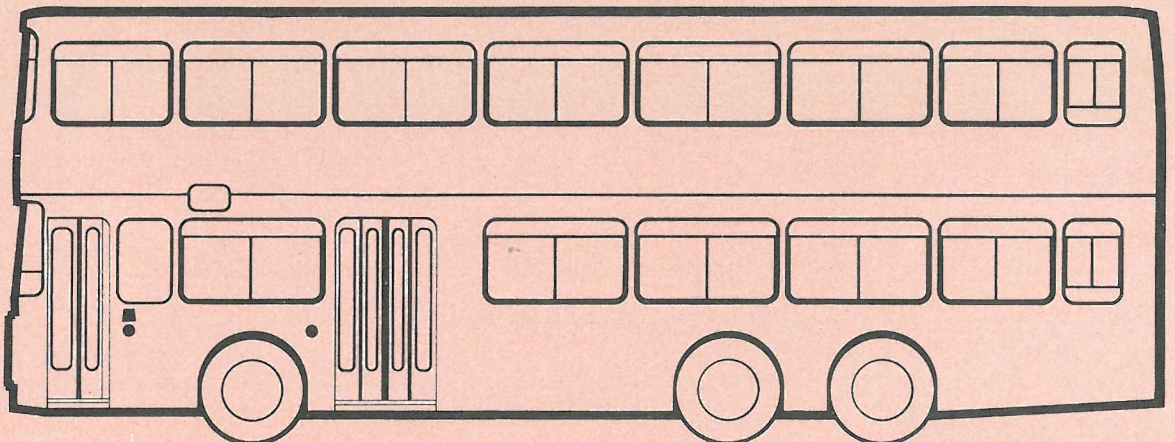
10.2 metre single door double deck, with 86 seats and centre exit option



11.5 metre single deck standee city vehicle, with 50 seats.



12 metre 3-axle (export) high occupancy vehicle for 171 passengers, both seated and standee. It has a self steered rearmost axle which makes it as manoeuvrable as a conventional bus.

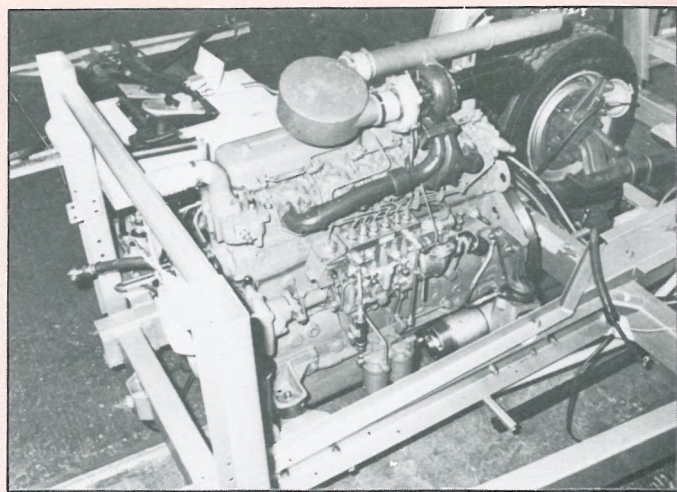


The Major Components

Developed from the world-renowned Volvo seven litre range of engines, the Ailsa is powered by a special bus application TD70H high torque engine.

The design benefits from Volvo's vast experience of turbo charging which goes back to 1955 and ensures that all engine components are designed and built for long and trouble-free service. Small yet powerful, it is totally proven in over 6,000 public service vehicles all over the world.

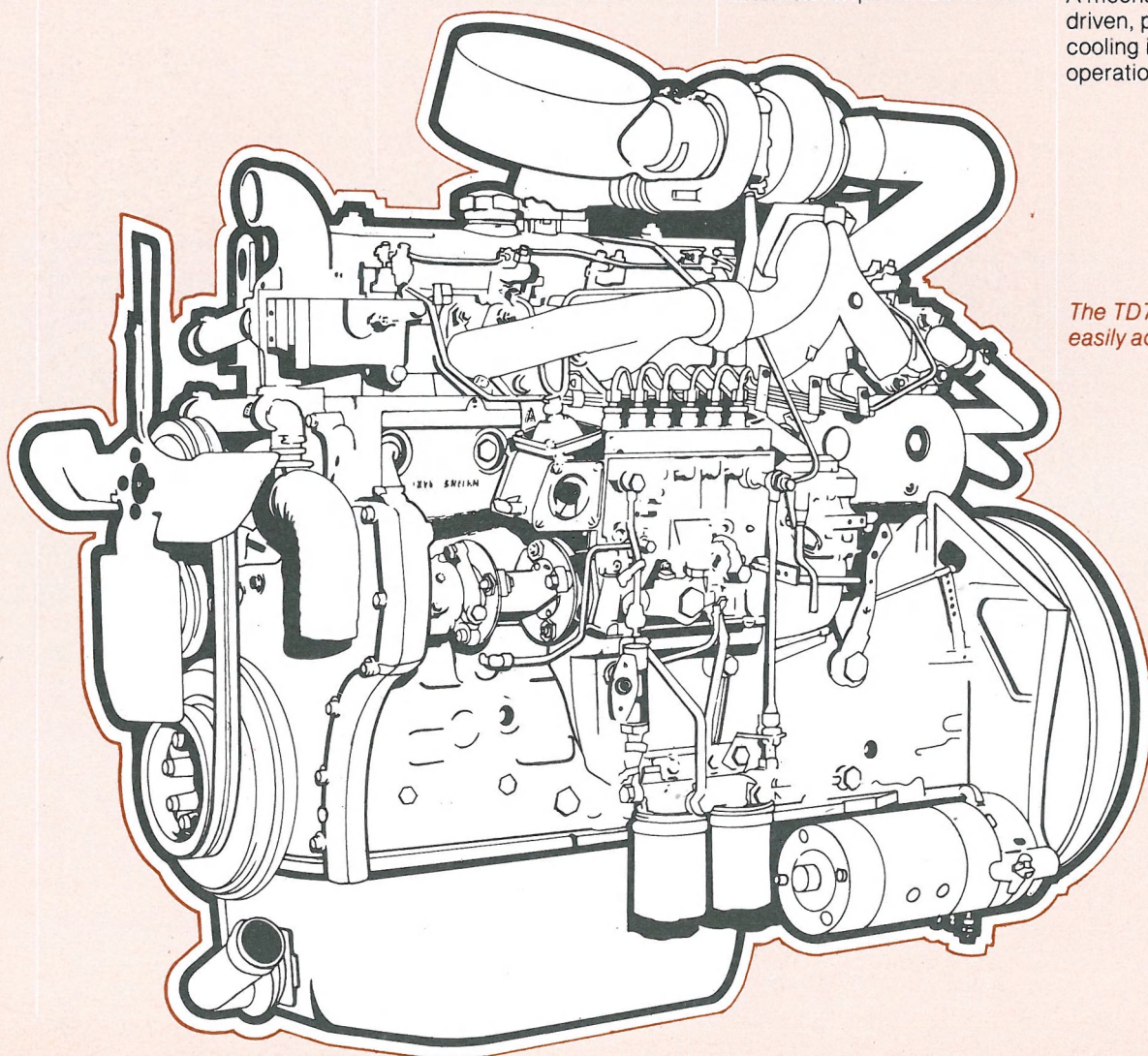
1 Engine



It has a capacity of 6.7 litres, produces 138 Kilowatts (186 brake horse power) at 2,000 revs per minute, with options of 143 Kw (193 bhp) at 2,200 rpm and 150 Kw (201 bhp) at 2,400 rpm. Net installed torque is 660 Newton

Metres (487 lbf.ft) at 1,400 rpm irrespective of power output.

The engine is positioned at the front of the bus and has a forward mounted radiator directly in front of it. A mechanical drive fan, V-belt driven, provides efficient cooling in the most difficult operational conditions.



The TD70H, a compact and easily accessible power house.

The Major Components

Fuel & Exhaust Systems

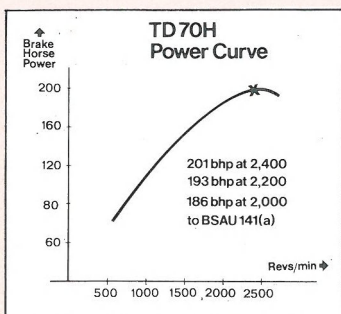
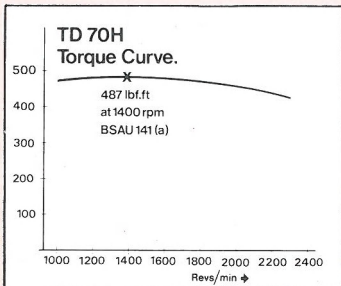
Fuel tank:	205 litres (45 gall.) rear mounted steel tank.
Fuel filler:	Offside rear. Snap shut filler cap.
Fuel pipes:	Plastic, with steel braided flexible pipes to engine.
Fuel filters:	Two disposable elements.
Shut off valve:	Access through front grille.
Fuel pump:	In line mechanically governed fuel pump.
Exhaust piping:	Steel pipe from turbocharger to heat exchanger; 90mm (3.50in.) dia. steel tube, heat exchanger to silencer.
Silencer:	Reactive type. Separate tail pipe.
Air cleaner:	Disposable paper element.

Accessibility is good with all the major components mounted on the left hand side of the engine and easily accessible through removable side panels. The fire-retardant engine encapsulation provides good noise and heat insulation.

Engine control

Throttle:	Air throttle control SCG transmission. Cable throttle control Voith transmission.
Engine stop:	Solenoid operated.
Cold start:	Electrical heater.

The easily removed panel at side of engine provides access to all major components.



The Major Components

The Ailsa Bus is based on the well-proven concept of separate chassis and bodywork which allows the operator the widest possible choice in type and style. The chassis underframe was designed in conjunction with a leading British bodybuilder and built so that the strength of both body and chassis are fully integrated to provide a particularly robust structure.

The underframe comprises a box section central spine to which crossbearers are welded, linking up with the peripheral framing. A steel safety cage is provided at the front end of the underframe to improve driver protection in the event of a frontal collision. He is much better protected with this design of vehicle than with a rear engined bus.

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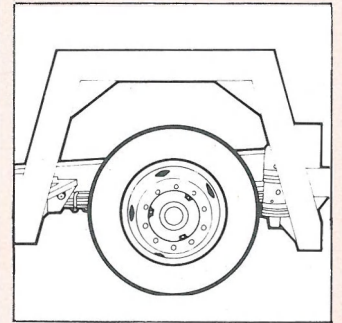
Chassis & Underframe

Centralised electrics with all components grouped on easily accessible board.

The peripheral framing was a new concept in bus design in the early seventies, when the Ailsa Bus was developed, and has proved totally reliable in operation both in the UK and the Far East. The problems associated with chassis/body movement on conventionally designed double deckers are totally eliminated.

The underframe has been designed in conjunction with a leading UK bodybuilder to provide the required strength at body mounting points. Crossbearer positioning is designed to take advantage of present day 5ft. 2in. - 5ft. 4in. (1600mm) pillar spacing.

A sturdier vehicle for intensive operation overseas is available based on a closer spacing of the crossbearers to provide for 3 ft 11in (1200mm) pillar spacing.



The secret behind the strength. Totally jig welded perimeter framing.

Complete corrosion resistance is given by a stainless steel paint finish.

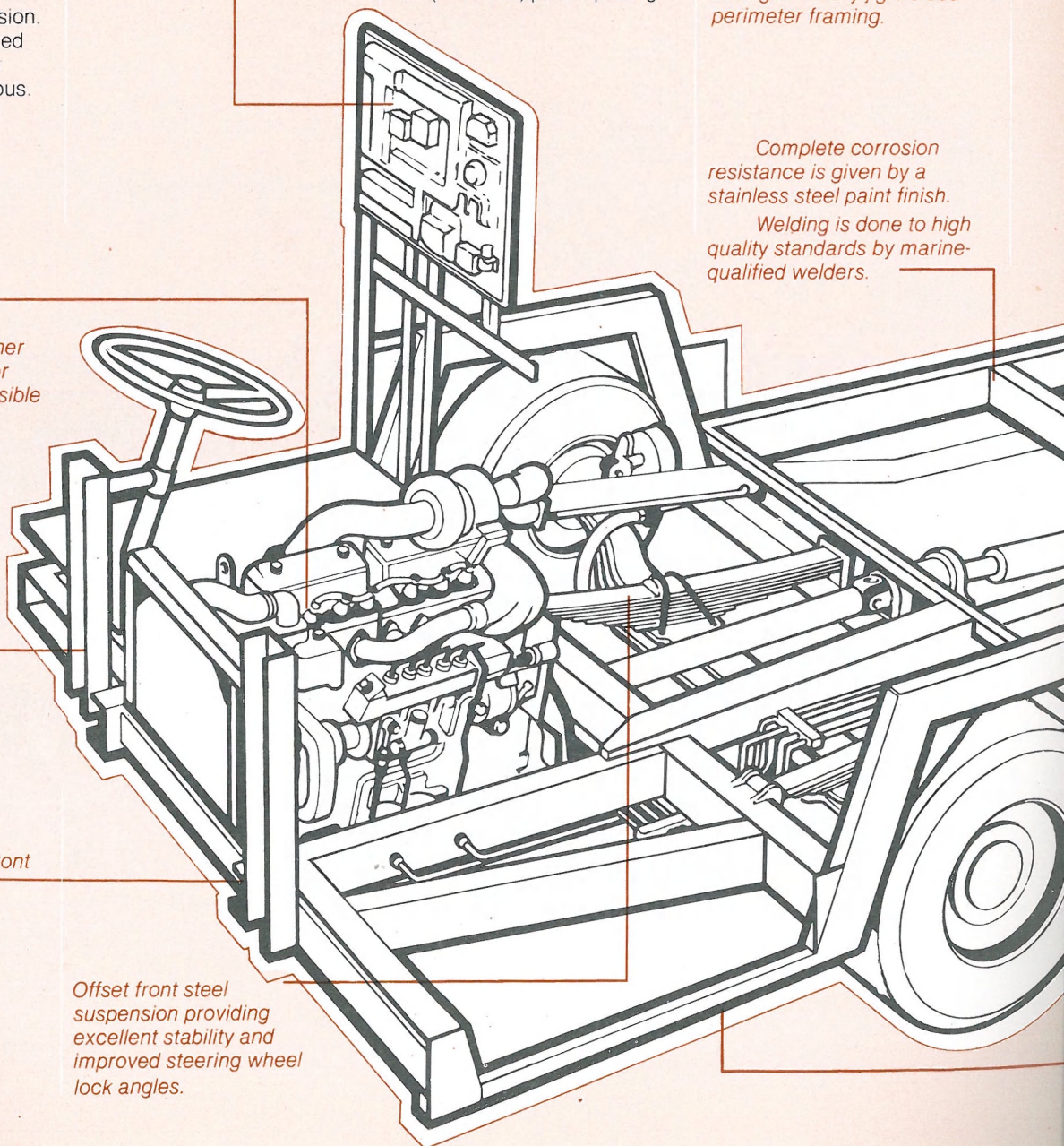
Welding is done to high quality standards by marine-qualified welders.

Day to day maintenance items, including oil filler, dipstick, windscreen washer bottle, air system governor valve, are all easily accessible by lifting grille at front of vehicle.

Steel Safety Cage

Robust towing connections provided at front and rear of underframe.

Offset front steel suspension providing excellent stability and improved steering wheel lock angles.

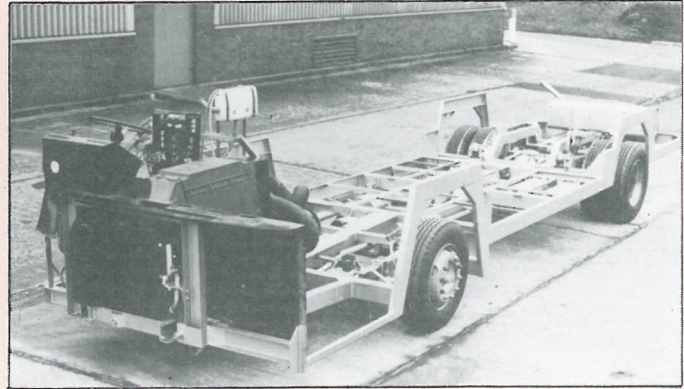


The Major Components

General Information UK 9.8 metre vehicle

Semi-integral double deck bus underframe with a Volvo TD70H engine front mounted, a five-speed Wilson epicyclic gearbox centrally mounted and a spiral bevel single reduction straight rear axle.

Wheelbase:	4.953m	(16ft 3in)
Track (front):	2.035m	(6ft 8 ¹ / ₃ in)
Track (rear):	1880m	(6ft 2in)
Overall chassis length:	9.783m	(32ft 1in) (excluding towing eyes)
Overall chassis width:	2.356m	(7ft 8 ³ / ₄ in)
Gross vehicle design weight:	16256kg	(16 tons)
Front axle design weight:	6610kg	(6.5 tons)
Rear axle design weight: (Dependent on suspension)	13208kg	(13 tons)

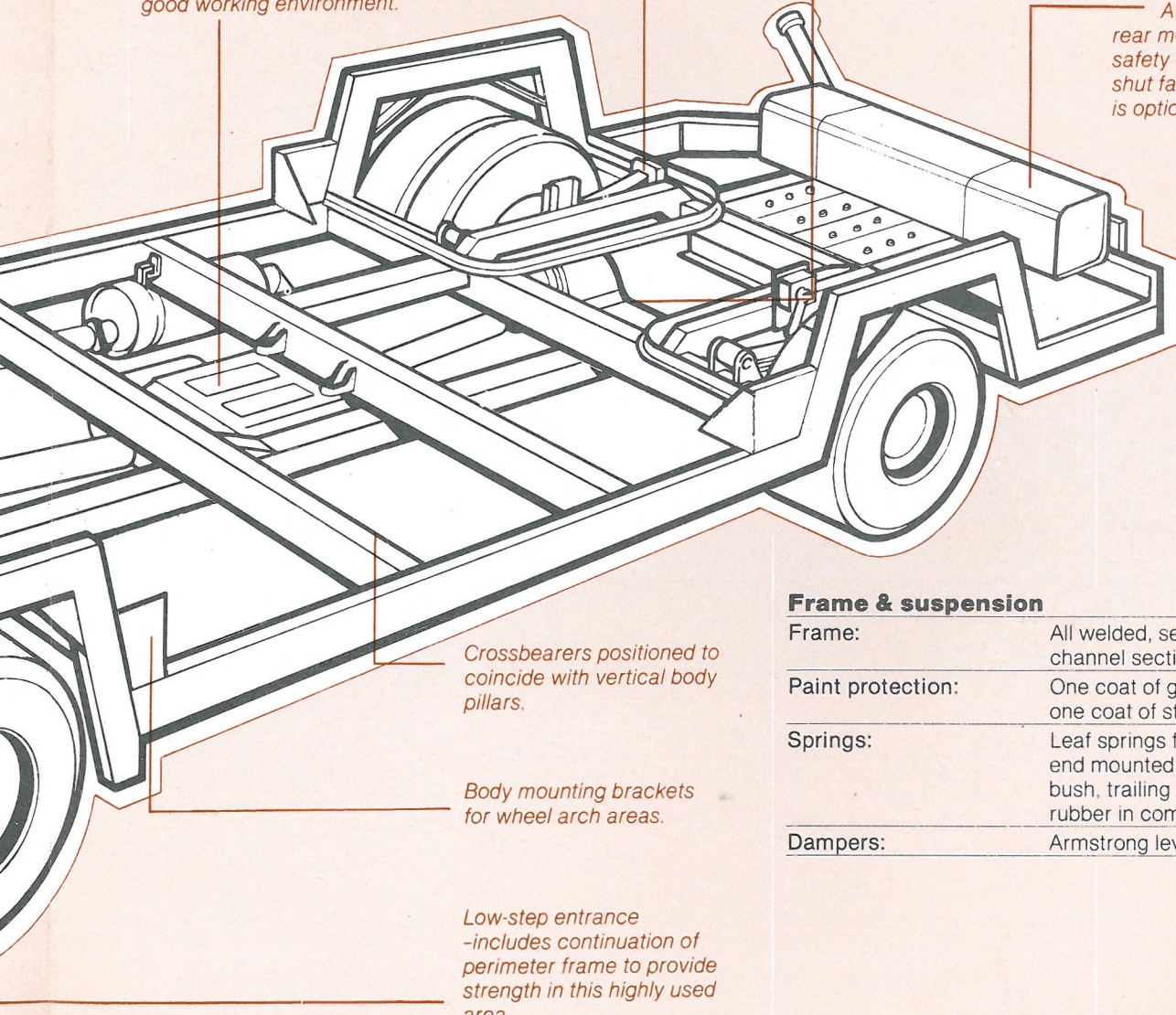


Remote mounted gearbox providing ease of access and good working environment.

Maintenance-free suspension system featuring rubber bushing.

Straightforward single reduction straight rear axle providing maximum efficiency.

A 45-gallon fuel tank is rear mounted behind a steel safety cage and has a snap-shut fast-fill cap. A fuel gauge is optional.



Crossbearers positioned to coincide with vertical body pillars.

Body mounting brackets for wheel arch areas.

Low-step entrance - includes continuation of perimeter frame to provide strength in this highly used area.

Frame & suspension

Frame:	All welded, sealed box section with channel section peripheral frame.
Paint protection:	One coat of grey primer-surfacer, one coat of stainless steel paint.
Springs:	Leaf springs front and rear, leading end mounted in bonded rubber bush, trailing end mounted by rubber in compression.
Dampers:	Armstrong lever type.

The Major Components

3 Engine Cooling System

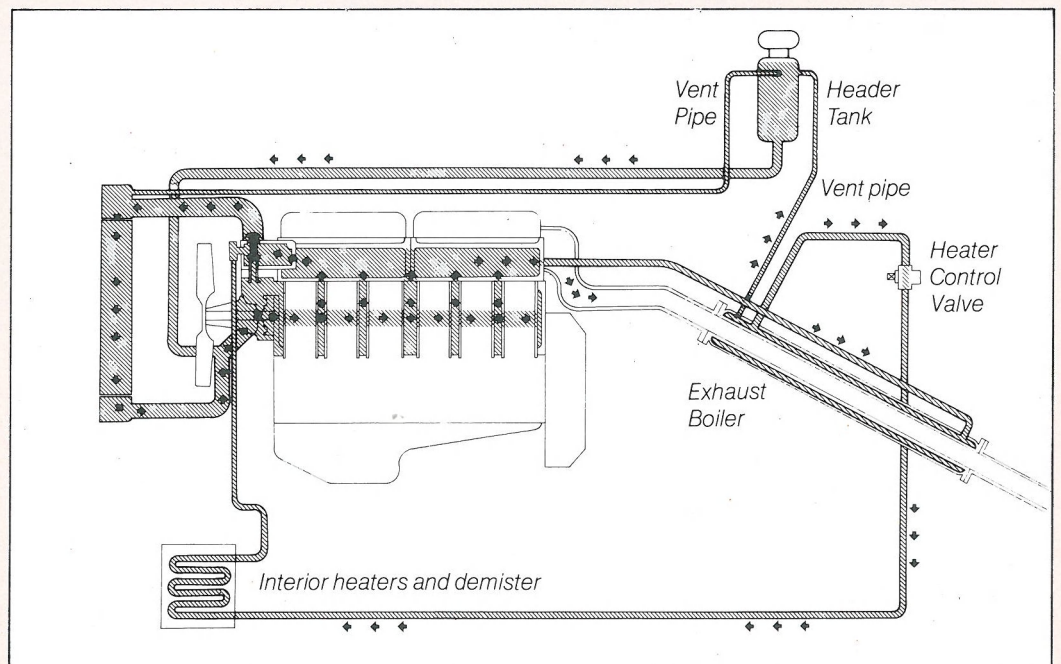
With the accent on reliability, the cooling system is purpose-designed for psv operation. The front-mounted radiator has four rows (five rows for tropical cooling and Voith transmission) and ensures efficient engine cooling at all times. Two wax thermostats enable the engine to warm up quickly and a water jacketed exhaust provides a heat exchange for additional input for the vehicle's interior heaters and demisters. Take-off points in 25mm (1 in. diameter) copper

tubing are provided for the heater and demisters, terminating in heavy duty gate valves for simple connection by the bodybuilder. All water hoses are silicone rubber for a long and maintenance-free life. The plastic header tank has a see-through water level - no need to remove the filler cap to see the level.

Engine cooling system

Header Tank:	Plastic, 6.5 litre capacity 4 lb/in ² pressure cap
Radiator:	4 row, 5 row for tropical cooling and Voith transmission.
Exhaust heat exchanger:	To provide additional heat for demister, and to cool exhaust gases.
Heater piping:	Copper, 25mm (1in) diameter.
Valves:	Separate valves for heater and demister.
Hoses:	Silicon rubber throughout.

Schematic layout of Cooling system



The Major Components

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Engine Encapsulation

An effective engine encapsulation system is provided which gives both heat and noise insulation. The heat insulation material is class II fire retardant. Engine access is good, with all major units on the left hand side.

This includes the fuel pump, accelerator control linkage, exhaust manifold and turbo charger, fuel filters and fuel shut-off valves.

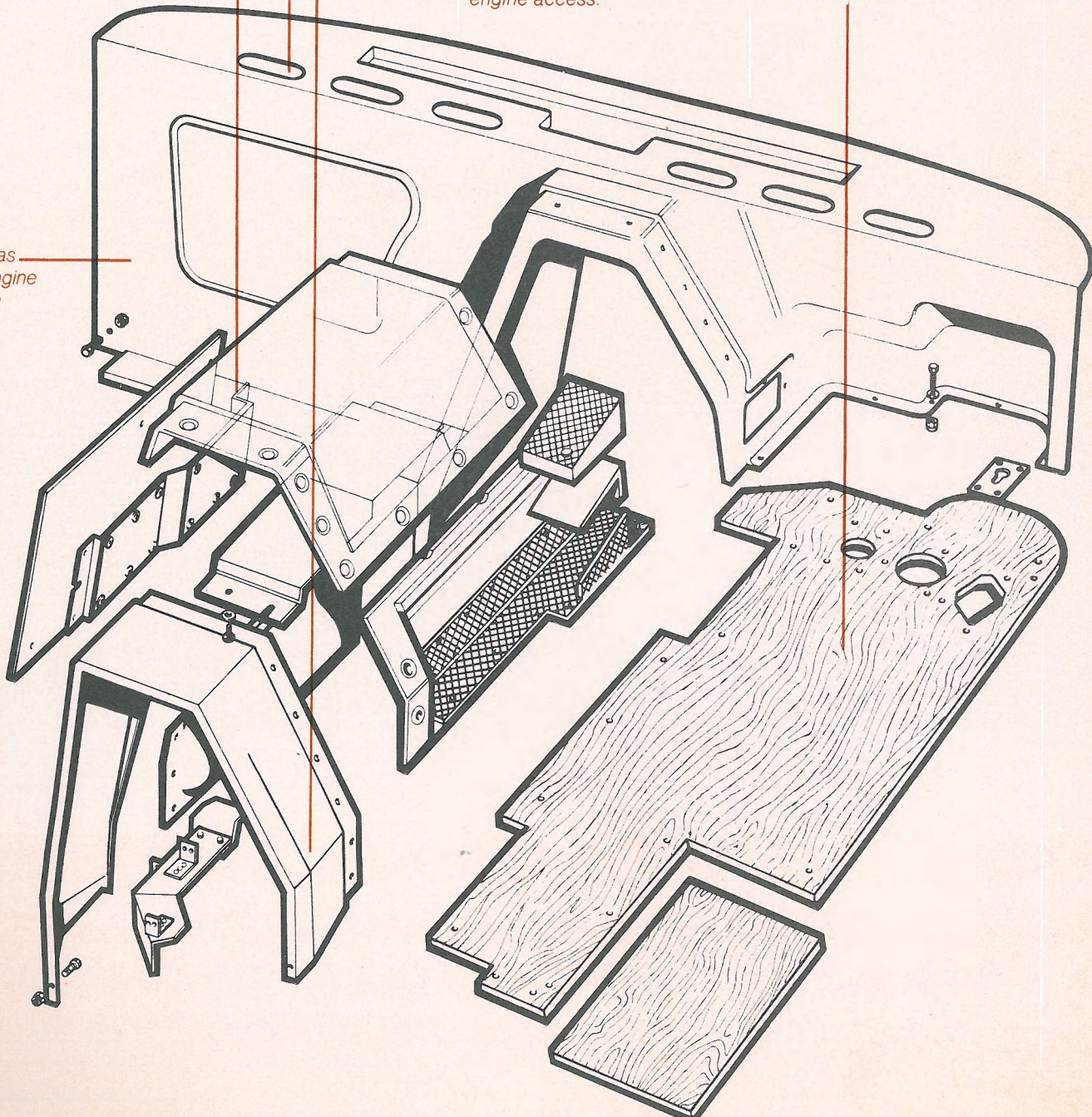
Top of engine cover provides ideal working base for fare collection equipment.

Demister slots incorporated in front GRP panel.

1" (25mm) marine ply flooring incorporating draught-proofed connections for brakes, accelerator and steering column.

Front panel incorporated as standard in engine encapsulation

All engine covers easily removable to provide all-round engine access.



The Major Components

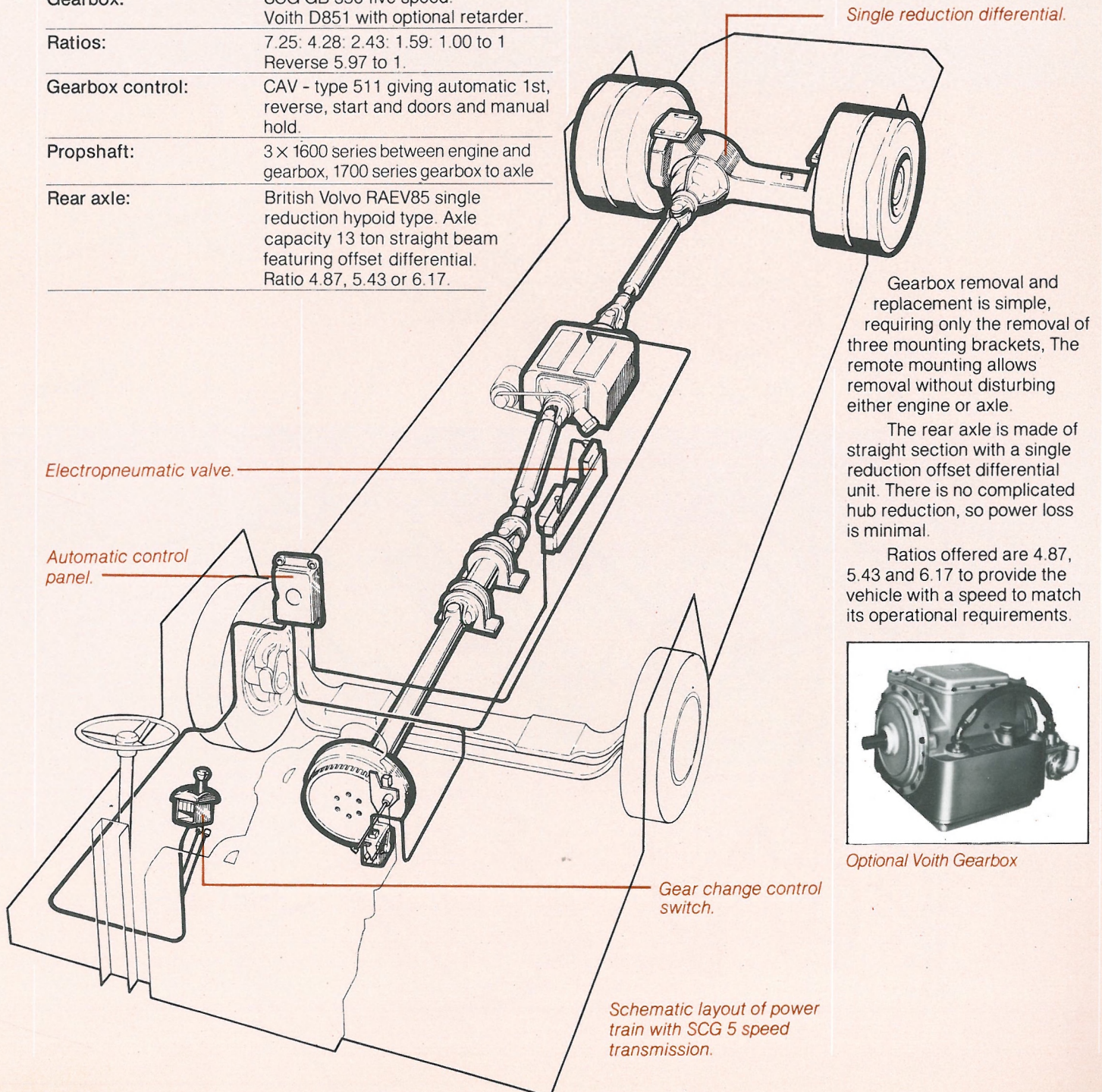
5 Power Train

Power train; SCG Equipment

Fluid flywheel:	SCG 17.25 in. (438mm) diameter with stall plate (900 rpm stall speed)
Gearbox:	SCG GB 350 five-speed. Voith D851 with optional retarder.
Ratios:	7.25: 4.28: 2.43: 1.59: 1.00 to 1 Reverse 5.97 to 1.
Gearbox control:	CAV - type 511 giving automatic 1st, reverse, start and doors and manual hold.
Propshaft:	3 x 1600 series between engine and gearbox, 1700 series gearbox to axle
Rear axle:	British Volvo RAEV85 single reduction hypoid type. Axle capacity 13 ton straight beam featuring offset differential. Ratio 4.87, 5.43 or 6.17.

The power train is simple and effective. Two transmission systems are offered with the choice of a Self Changing Gears 5 speed pneumocyclic gearbox or Voith D851 fully automatic gearbox, including torque converter and built-in hydraulic retarder. Both systems are mid-mounted where they benefit from the

natural cooling of the vehicle and are easily accessible for inspection and service. The SCG transmission uses a fluid flywheel at the rear of the engine and is designed to benefit from natural cooling. This transmission is available with the option of either semi-automatic, or fully automatic control using CAV 511 auto control.

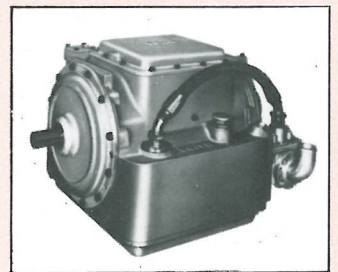


Single reduction differential.

Gearbox removal and replacement is simple, requiring only the removal of three mounting brackets. The remote mounting allows removal without disturbing either engine or axle.

The rear axle is made of straight section with a single reduction offset differential unit. There is no complicated hub reduction, so power loss is minimal.

Ratios offered are 4.87, 5.43 and 6.17 to provide the vehicle with a speed to match its operational requirements.



Optional Voith Gearbox

Schematic layout of power train with SCG 5 speed transmission.

The Major Components

Suspension

Conventional leaf springs are mounted in non-wearing rubber bushes making chassis lubrication unnecessary. There are no shackle pins to wear out either.

The front suspension is asymmetrically mounted and has the double benefit of providing good steering angles and added vehicle stability.

Armstrong lever shock absorbers are provided on both the front and rear axles. The leading eye of all springs is located in a screwed rubber bush with the rear mountings taken in Metalastic compression joints, providing for a quiet and wear-free long life.

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Suspension, Steering & Axles

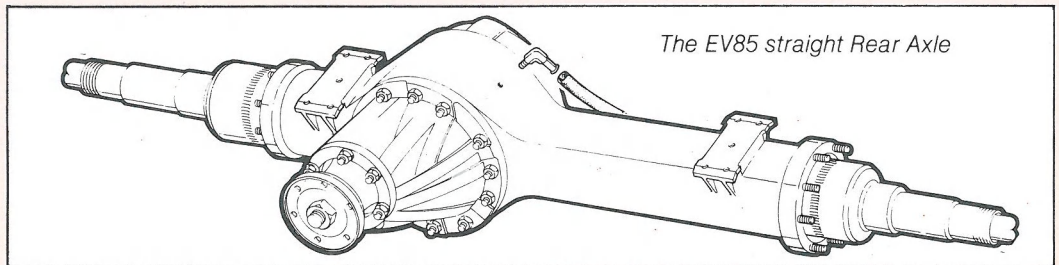
Steering

Power steering is standard, and features a ZF integral box remote-mounted for safety away from the immediate front of the vehicle.

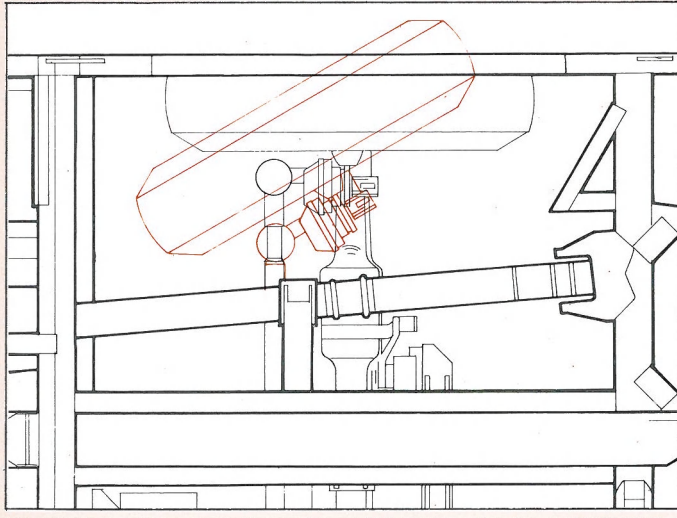
A good steering lock provides a between-the-kerbs turning circle of 63ft. (19.2 metres.) The power assistance is provided with an unloader

valve mechanism to prevent overloading the system should the driver maintain pressure on the steering wheel when on full lock.

Power steering is desirable for driver comfort, particularly in tropical conditions.



The EV85 straight Rear Axle



Asymmetrically mounted front suspension

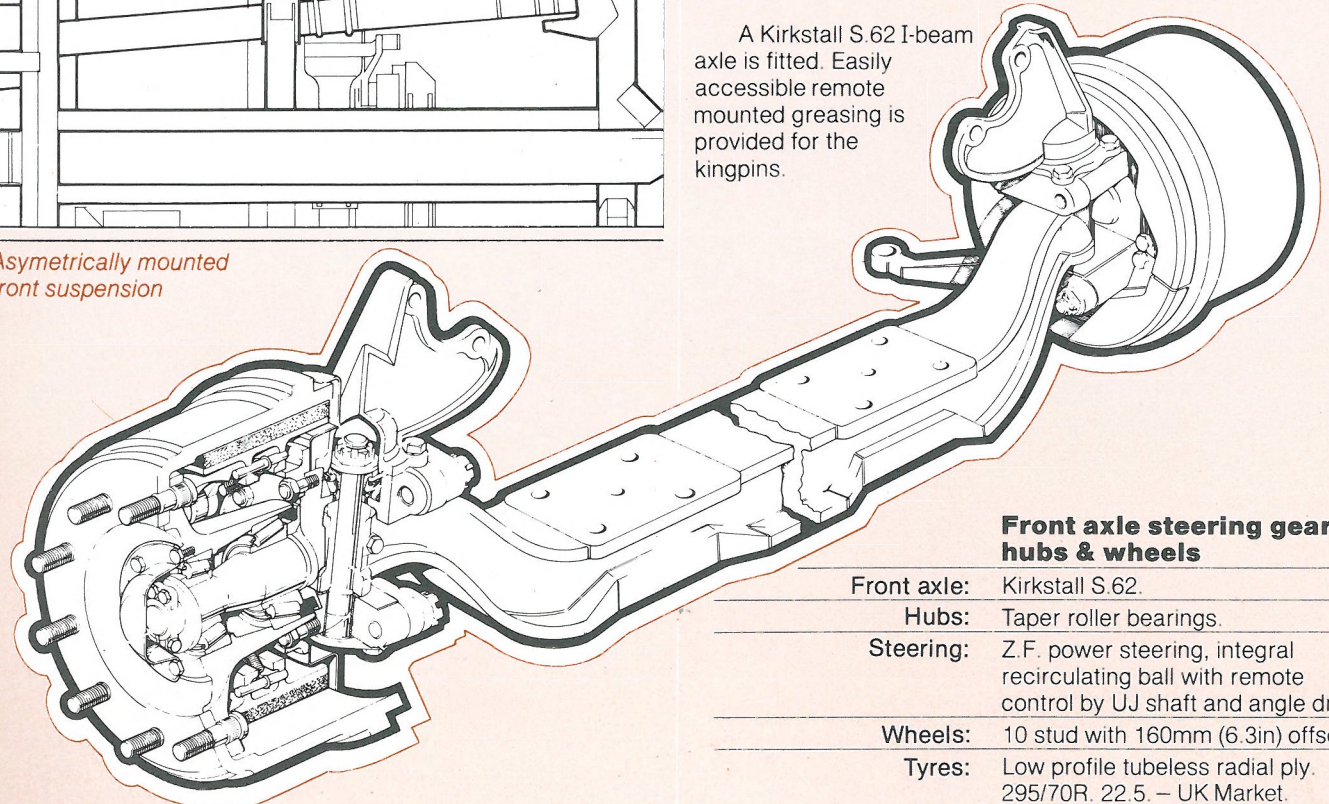
Rear axle

The EV85 rear axle has a design capacity of 13 tons (13209 Kg). A single reduction differential unit drives the half shafts. The hubs are straight driven with no hub reduction.

Rear axle: ratios available -
4.87 to 1
5.43 to 1
6.17 to 1

Front axle

A Kirkstall S 62 I-beam axle is fitted. Easily accessible remote mounted greasing is provided for the kingpins.



Front axle steering gear, hubs & wheels

Front axle:	Kirkstall S 62.
Hubs:	Taper roller bearings.
Steering:	Z.F. power steering, integral recirculating ball with remote control by UJ shaft and angle drive.
Wheels:	10 stud with 160mm (6.3in) offset.
Tyres:	Low profile tubeless radial ply. 295/70R. 22.5. - UK Market. 11.00 x 22.5 tubeless or 10.00 x 20 tubed tyres available for export

The KIRKSTALL S62 I-beam front axle

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Vehicle Electrics & Driver/Cab Environment

Centralised electrics

Centralised electrics mean that all units, except batteries and alternator, are grouped together on one central panel on the bulkhead behind the driver.

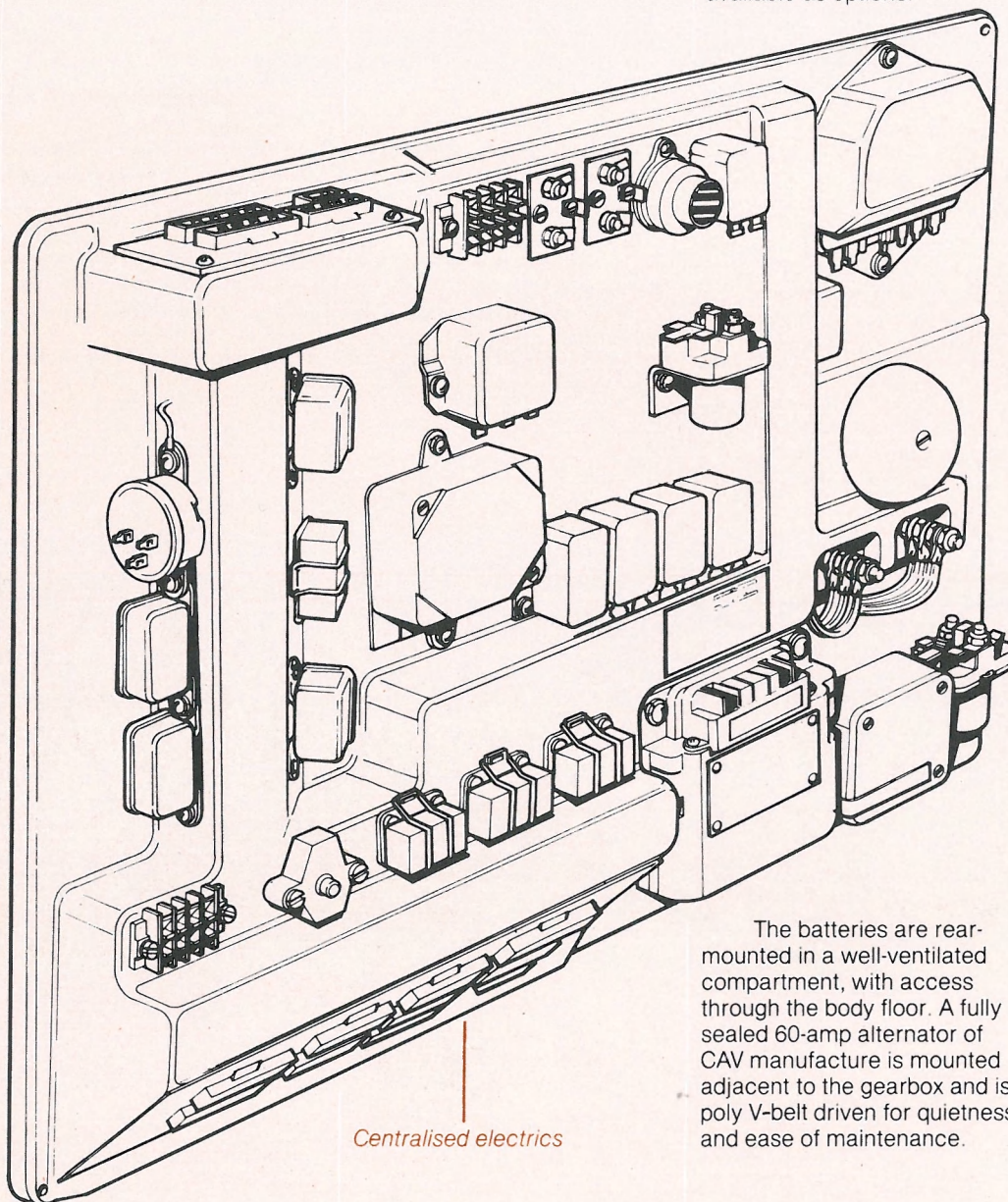
Lead acid batteries are standard, with four 6-volt cells giving a 24 volt earth return system, and a storage capacity of 175 ampere hours. Lucas LCV 12 and Lucas HL 14 alkaline batteries are available as options.

Instrument panel

Full instrumentation is provided with speedometer, optional electronic tachograph, air pressure gauges that monitor pressure in both sides of the foundation brakes as well as auxiliary brake and parking brake supply pressure. A water temperature gauge is standard and there is the option of a fuel gauge on the left hand side of the dash. A comprehensive system of warning lights alerts the driver to any faults in the auxiliary circuits while important items such as low air pressure are monitored by a master warning light. This is mounted in the centre of the panel and flashes brightly to warn the driver of any malfunction. A buzzer backs up this warning system.

The instrument panel also incorporates 2 ventilators to provide the driver with face level ventilation.

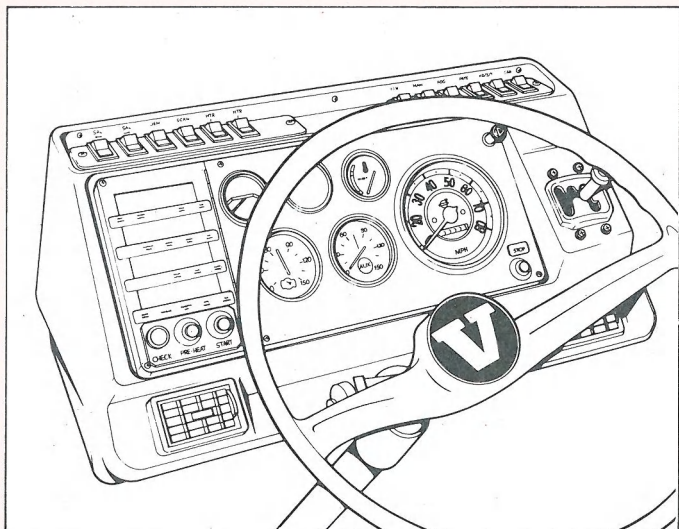
Additionally, export vehicles can be equipped with the option of cab air conditioning.



Centralised electrics

The batteries are rear-mounted in a well-ventilated compartment, with access through the body floor. A fully sealed 60-amp alternator of CAV manufacture is mounted adjacent to the gearbox and is poly V-belt driven for quietness and ease of maintenance.

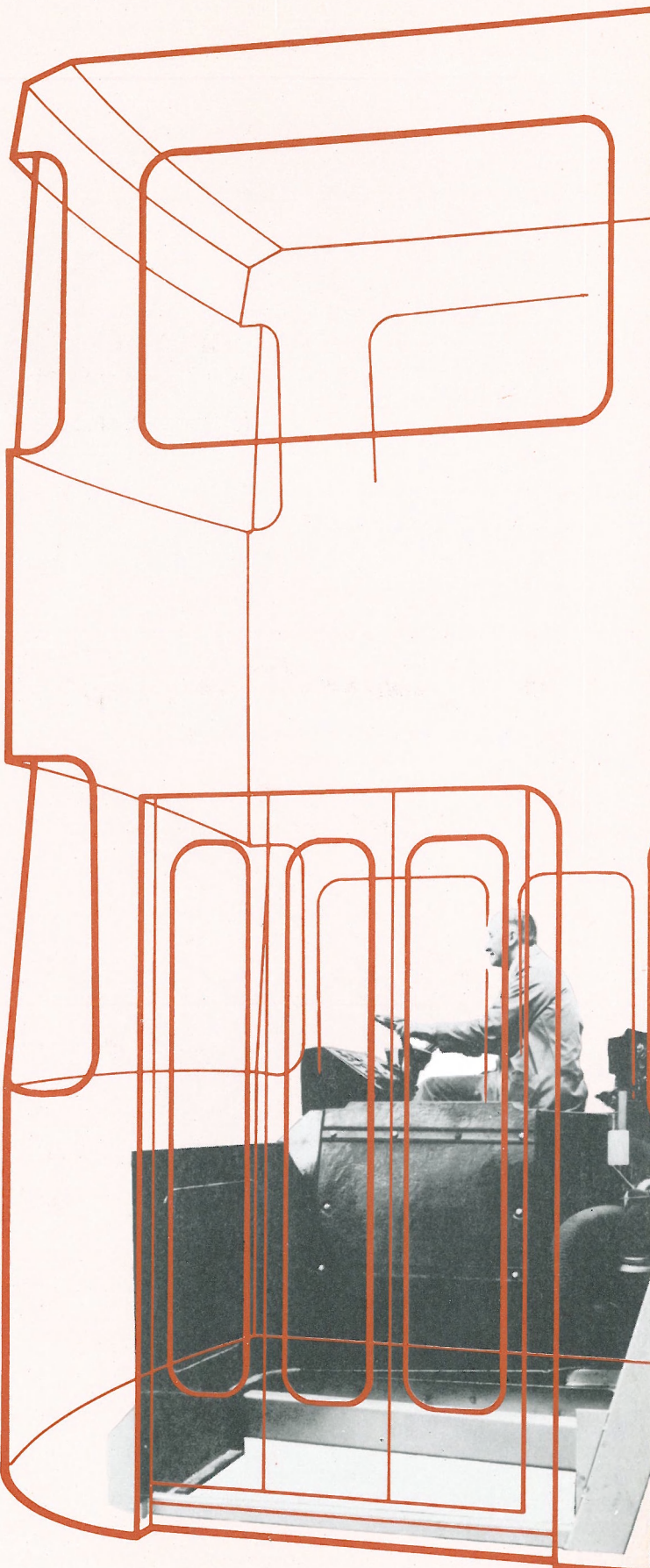
The Major Components



Instrument panel

Electrical systems and instruments

Starter:	CAV 5in 10hp Ref. No. S. 130L-S.997.
Alternator:	CAV 60amp, sealed Ref. No. AC 203/060/24-1. Belt driven from input shaft of gearbox. Adjustment by screw jack.
Control panel:	Removable, mounted inside the vehicle body behind the driver's seat, all connection by plug and socket.
Master switch:	CAV double pole, mounted at rear offside of vehicle Ref. No. 44A/1m.
Charging point:	Oldham No. 2 coupling at rear offside of vehicle.
Batteries:	Standard lead acid 4 x 175 amp/hr, 6 volt situated under rear floor. Option: Lucas LCV 12 (18 cells) Option: Lucas HL 14 (18 cells)
Speedometer:	Electrically operated. VDO type 5800. Tachograph optional.
Fuel gauge & sender:	Optional
Water temperature gauge	Electrical - VDO (gauge) - VDO (sender)
Warning lights:	Low air pressure. Water temperature. Heated screen. Alternator charge. Main beam. Oil pressure. Parking brake. Low water level indicators.
Switches:	Running lights, Dip, Horn, Wipers and Indicators are provided. Switches for saloon equipment and additional driving aids are also provided.
Harnesses:	Main harness in conduit, all others protected.



The driver is in command, with a high driving position and excellent visibility, His confidence is increased by the acceleration and responsiveness of the engine.

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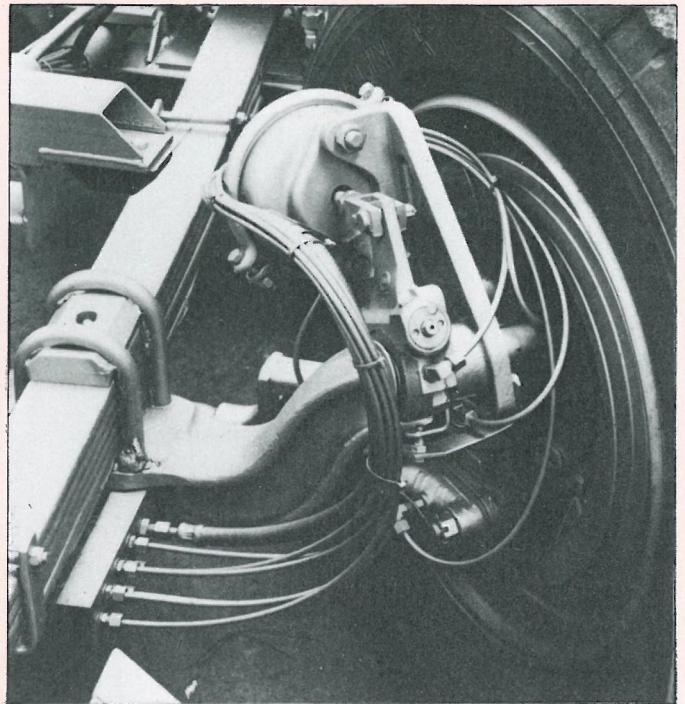
Braking System

The split system braking system incorporates an EEC 4-way charging valve to prevent the vehicle from being driven with insufficient air in the foundation brakes. The parking brake, which can be activated gradually, is conveniently mounted on the right hand side of the dash and is equipped with its own Schrader valve to blow off the spring brakes.

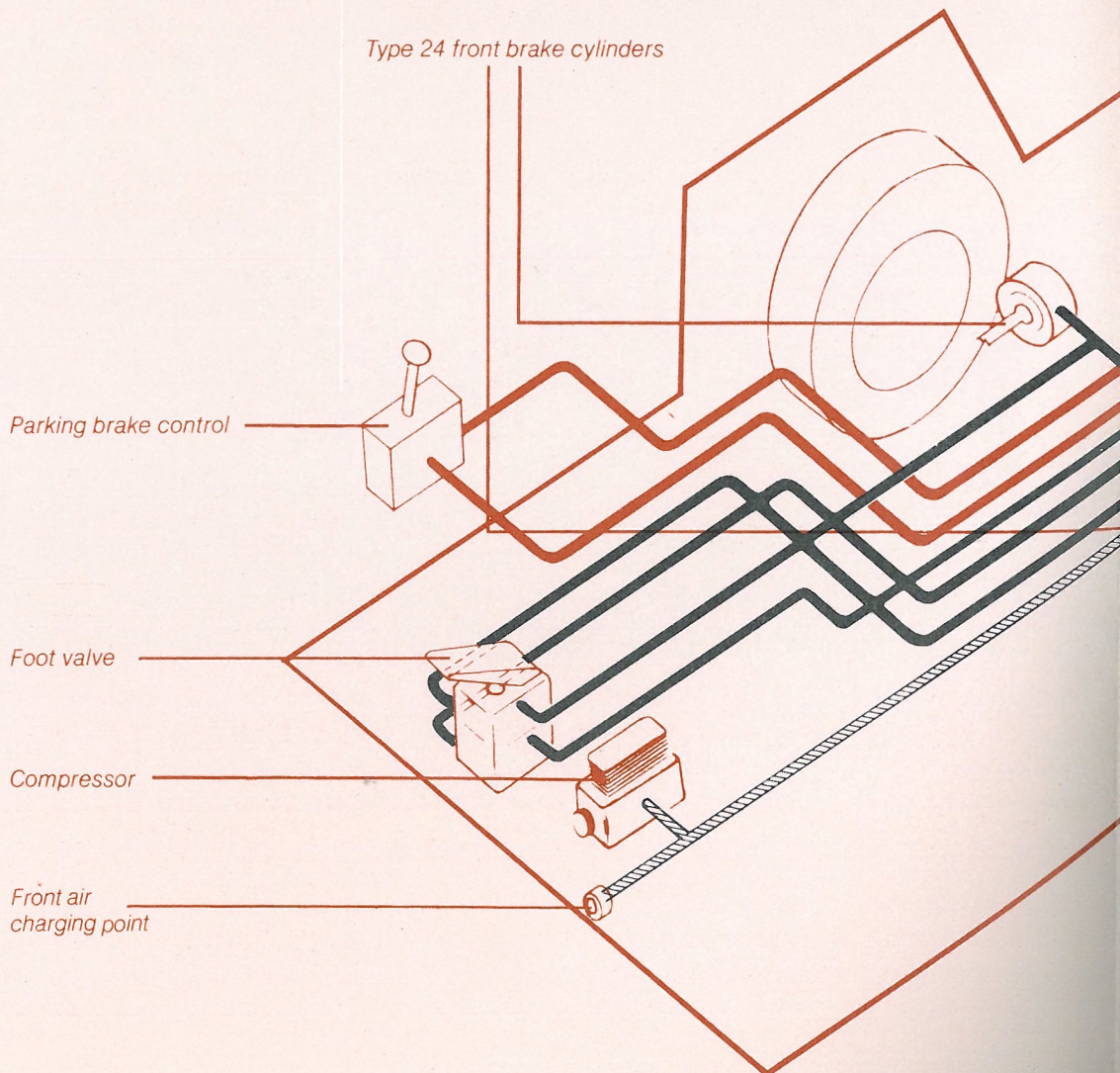
All air piping is flexible plastic which is strong and corrosion-free. A Westinghouse 'System Guard' airdryer is available as an option fitted in the circuit between the Westinghouse water cooled compressor and air tanks. External charging of the air system can be done from the front of the bus.

SAB automatic slack adjusters are fitted to all wheels as standard. Type 24 front and rear brake cylinders are fitted, the front cylinders being single diaphragm and the rear having a fail-safe parking brake.

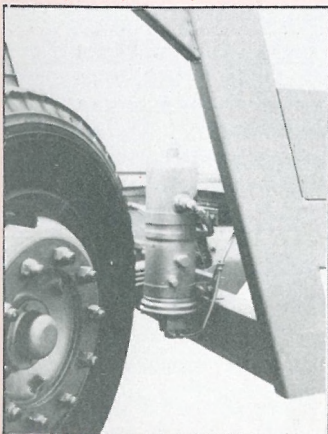
Relay valves fitted to the rear axle ensure quick response. The rear axle also has an anti-compound valve to prevent the combined effects of the driver applying both parking and foot brakes together.



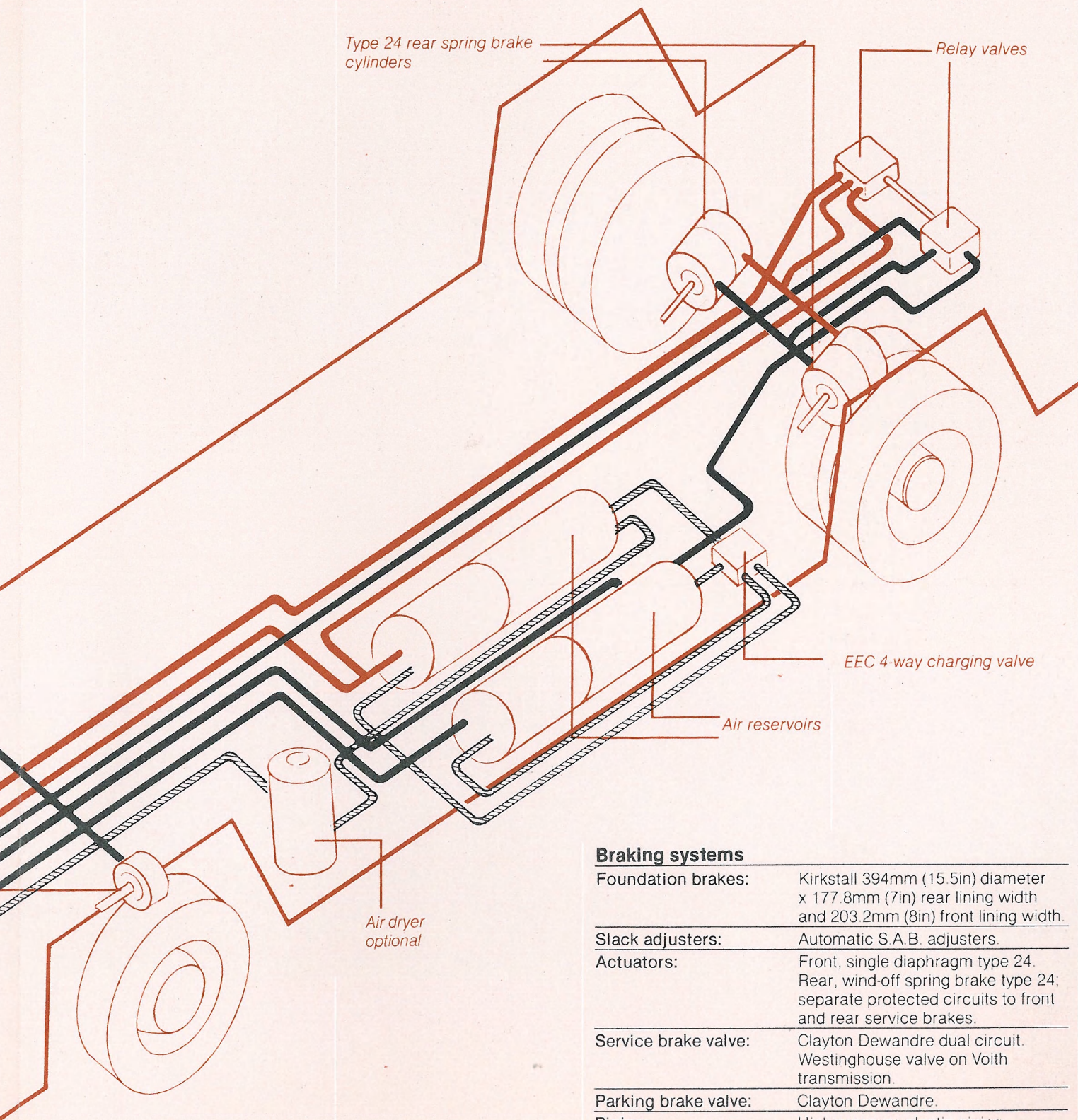
Front braking assembly



Air dryer (optional)



The Major Components



Braking systems

Foundation brakes:	Kirkstall 394mm (15.5in) diameter x 177.8mm (7in) rear lining width and 203.2mm (8in) front lining width.
Slack adjusters:	Automatic S.A.B. adjusters.
Actuators:	Front, single diaphragm type 24. Rear, wind-off spring brake type 24; separate protected circuits to front and rear service brakes.
Service brake valve:	Clayton Dewandre dual circuit. Westinghouse valve on Voith transmission.
Parking brake valve:	Clayton Dewandre.
Piping:	High pressure plastic piping.
Anti-freeze:	Alcohol. Optional Westinghouse air dryer.
Air reservoirs:	1 wet tank. 1 for parking brake. 1 for front brakes. 1 for rear brakes with 4-way system protection valve.

Bodywork Made Easy

Design of the underframe was undertaken in conjunction with a leading UK double deck bodybuilder and the underframe will accept all modern 5ft 2in - 5ft 4in (nominal 1600mm) pillar spacing bodies. The pillar attachments coincide with the high strength areas of the perimeter frame and cross-bearers. Body attachment to the framing can be done in several ways, depending upon the construction material. In the case of aluminium framed bodies the vertical pillars are rigidly attached by "Avdel" rivets. With steel framing, attachment can be rivetted or welded. Whichever body type is chosen, the operator is assured of an immensely strong chassis/body combination.

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Bodywork Made Easy

A low front entrance step makes it easy for passengers to get on and off the bus and the staircase can be positioned to suit either single door or 2-door operation.

The underframing is designed to provide a totally flat floor from aft of the front axle to the rear of the lower saloon. The bodybuilder simply lays the flooring directly on to the chassis - no need for separate underframing - thus saving money and weight. Another cost saver is the provision of seating rails in the lower saloon. Further assistance to the body builder is in the provision of screwed gate valves for the feed and return of hot water for the vehicle interior heating system

Easy cab access is provided for the driver with a low step entrance from his own door. The engine "hump" provides a natural barrier and helps to prevent driver assaults. The driver is further aided in this respect by having his own entrance door to the cab. The compact engine allows the driver a good wide working environment and its flat topped cover is an ideal location for one man fare collection equipment.

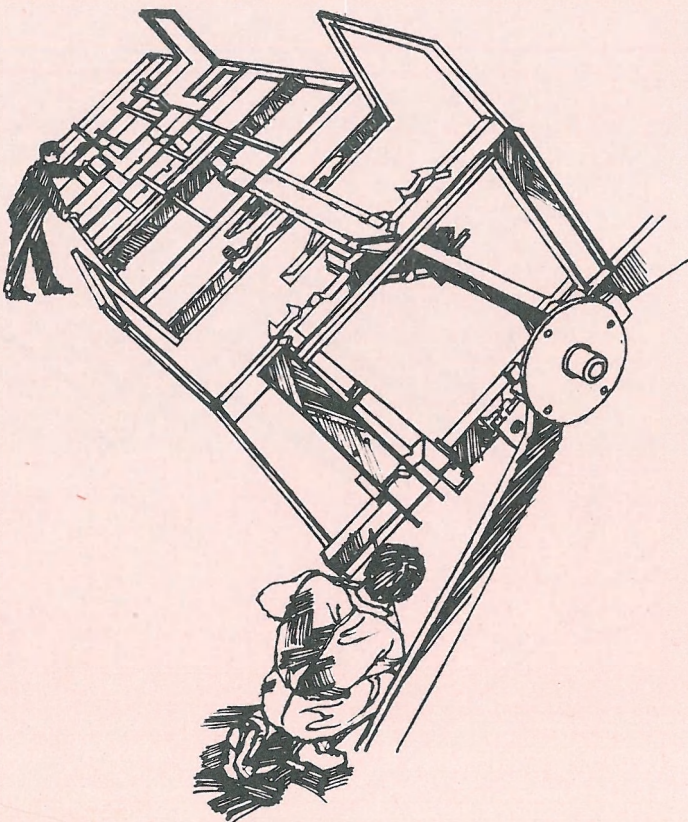
Equipment specification

Standard	Optional
underframe: of 9.8m overall length	10.2, 11.5, 12.0m underframe lengths
cooling: UK type	Tropical, with deeper section radiator Standard with Voith transmission.
batteries: Lucas lead acid	Lucas LCV12 or HL14 Alkaline
speedometer with mileage recorder	Lucas Kienzle electronic tachograph
gearbox: SCG with CAV511 automatic control	SCG semi automatic. Voith D851 fully automatic with built-in hydraulic retarder

other optional equipment

Fuel gauge,
Westinghouse air dryer,
two door layout,
automatic chassis lubrication,
various axle ratios and the provision of cab air conditioning on export vehicles

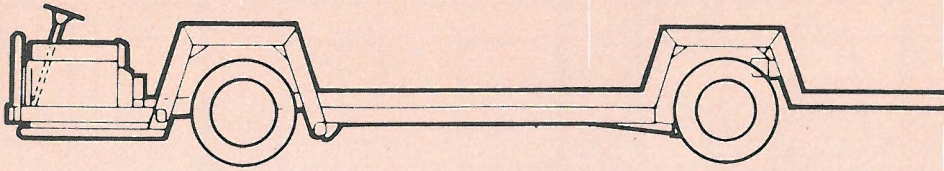
Particular operator requirements in addition to the above can be incorporated and every effort will be made to include each operator's specific requests.



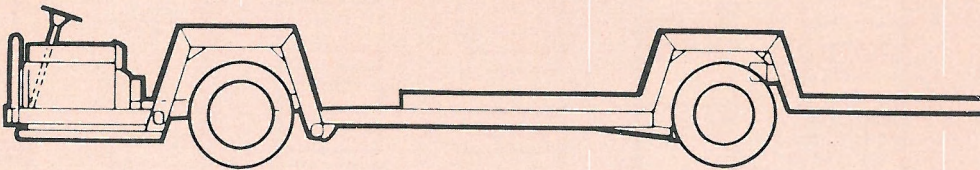
Chassis Length Options

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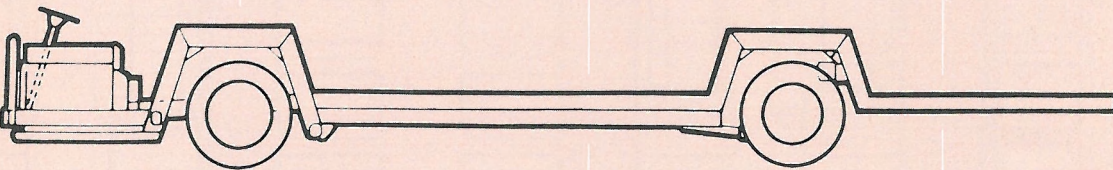
Chassis Length Options



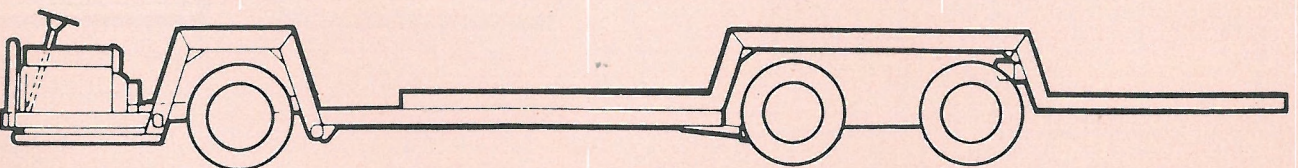
9.8 metre; UK Standard;
79 seats, single door



10.2 metre; UK Jumbo 2 door,
83 seats & Export variant;



11.5 metre
Single door
Single deck
High capacity Standee



12 metre Export
Super Jumbo
171 capacity, 2 door

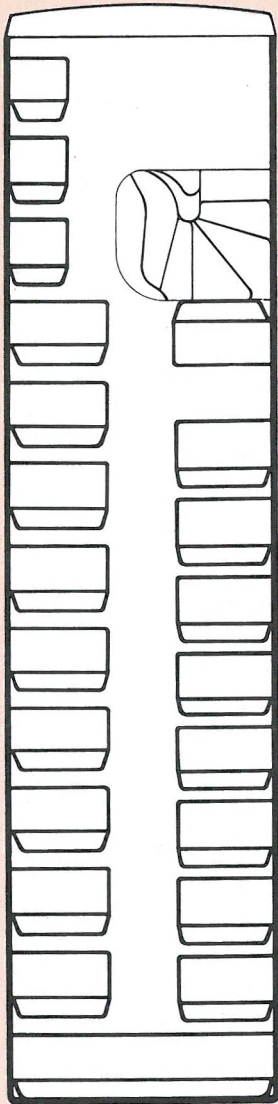
Seating Plans

9.8 metre
One door
Standard UK
layout
79 seat

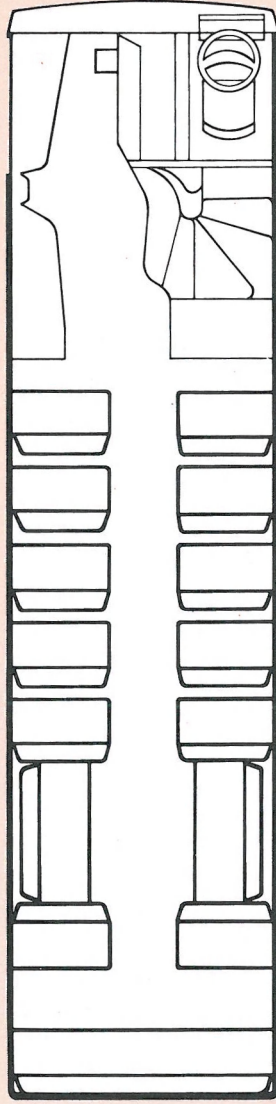
11

Seating Plans

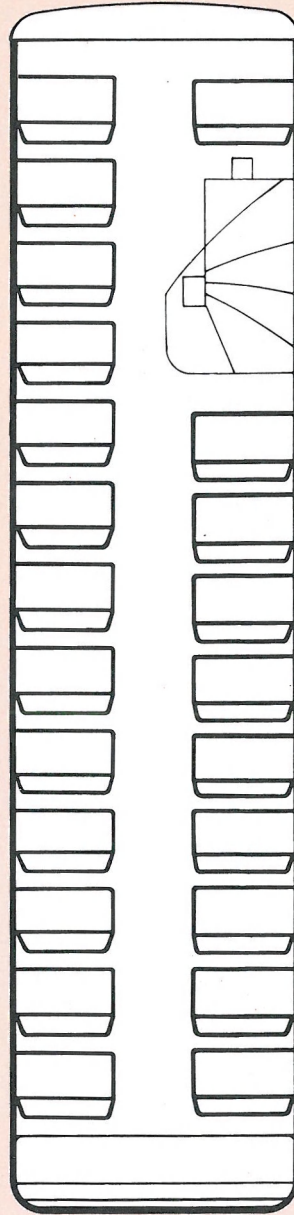
10.2 metre
2 door
Home/Export
87 seat Export variant shown



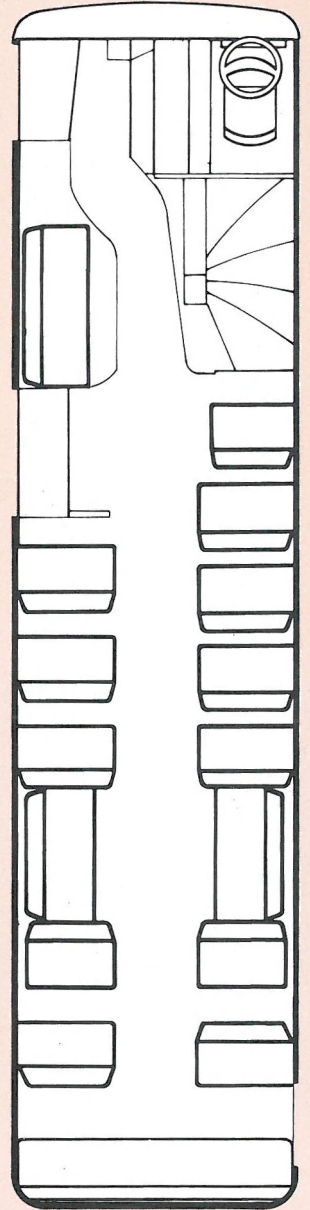
Upper deck



Lower deck



Upper deck

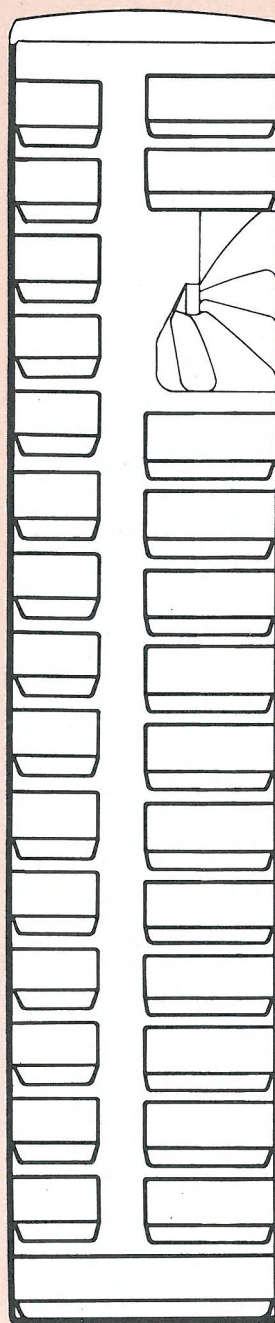
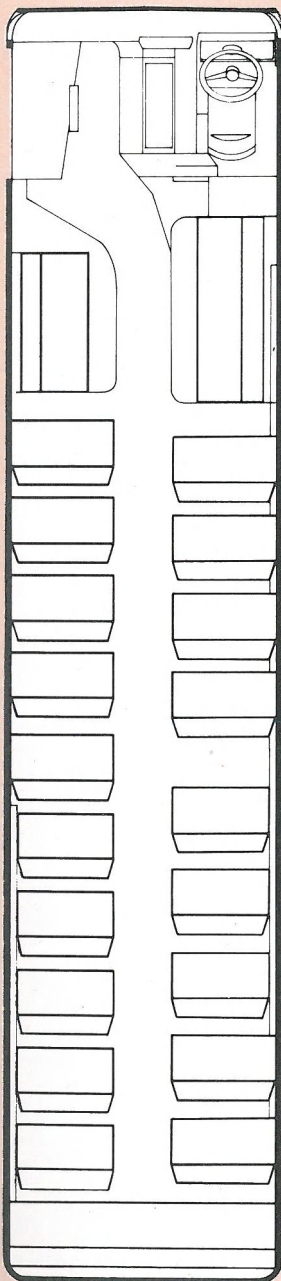


Lower deck

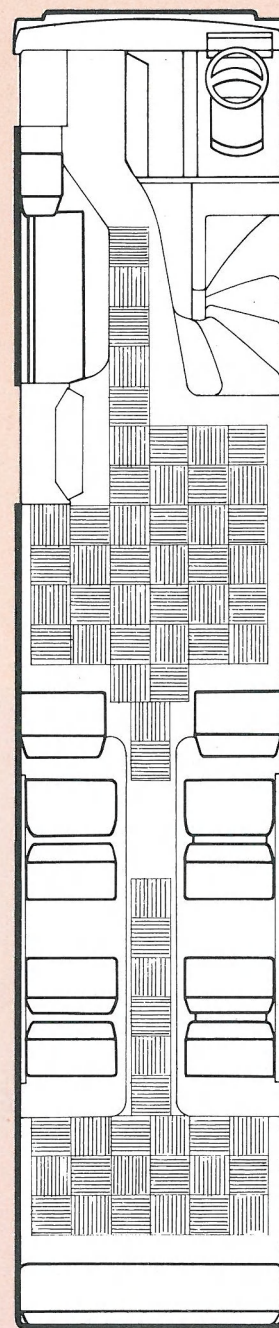
Seating Plans

11.5 metre length
Single deck
One door
High Standee
50 seat

12 metre
Export
Super Jumbo
6 × 2
171 capacity



Upper deck



Lower deck

12

After Sale Functions

Pre-delivery care and attention

At every stage of production, quality control inspections are carried out to ensure that even the smallest part and assembly is perfect. After assembly the finished underframes are stored under cover until required by the operators' chosen bodybuilders. Close liaison is maintained by the Irvine engineers with bodybuilders so that there is a continuous flow of technical information, co-operation and interchange of ideas. When the bus is completed, comprehensive pre-delivery inspections and road tests are undertaken by Irvine personnel, prior to the commissioning of vehicles in the UK.

The same procedures apply to exported vehicles but here the inspection and road testing is carried out by a Volvo Company subsidiary or local agent working under Volvo instructions. Operators are assured of receiving vehicles in first class condition, both in the UK and abroad.

Technical Literature

Workshop and Parts manuals, which cover every aspect of the underframe, are available and a comprehensive driver training guide familiarises drivers with all operating procedures.

Volvo Bus GB personnel make regular visits to all operators to advise on technical aspects of vehicles and the Volvo Bus Service Manager is always available to discuss any other matters relating to the operation of the buses.

Warranty

A 12 month warranty on the underframe - irrespective of mileage - starts from the date of delivery to the operator from the bodybuilder. Both parts and labour are fully recoverable with the labour content reimbursed on a negotiated scale.

Training

Volvo Bus (GB) provide two training programmes:

a) Supervisory Staff

A fully equipped technical training school instructs operators' supervisory staff on in depth maintenance and reconditioning of the major units in the underframe.

b) Operational Staff

In-house training can be provided for operational staff to fully familiarise them with the day-to-day operation and maintenance of the vehicle.

Parts

Operators enjoy direct access to the Parts warehouse at Irvine where parts can be purchased at favourable discounts with free delivery to the operators' central premises within the United Kingdom.

Scaling lists are available to advise the optimum stocking level for the number of vehicles operated and Parts representatives make regular visits to operators' parts personnel to discuss these and other relevant matters.

High importance is placed on VOR orders and these parts are despatched on overnight transport to be available the following morning at the operators' premises.

Operators also benefit from the Parts Plus promotion which ensures that fast moving items are available at the most competitive prices.

Service Exchange

Major items of the underframes are covered by the Service Exchange Plan. Replacement parts, reconditioned by the manufacturer, provide considerable savings in maintenance costs.

The Service Exchange Plan applies to all Volvo bus operators but may vary from country to country in overseas markets.

Our company policy is one of continuous improvement. There could therefore be detail changes in design and equipment without prior notification.

*The Real Alternative
available from:*

Volvo Bus (GB)

IRVINE

Ayrshire

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