

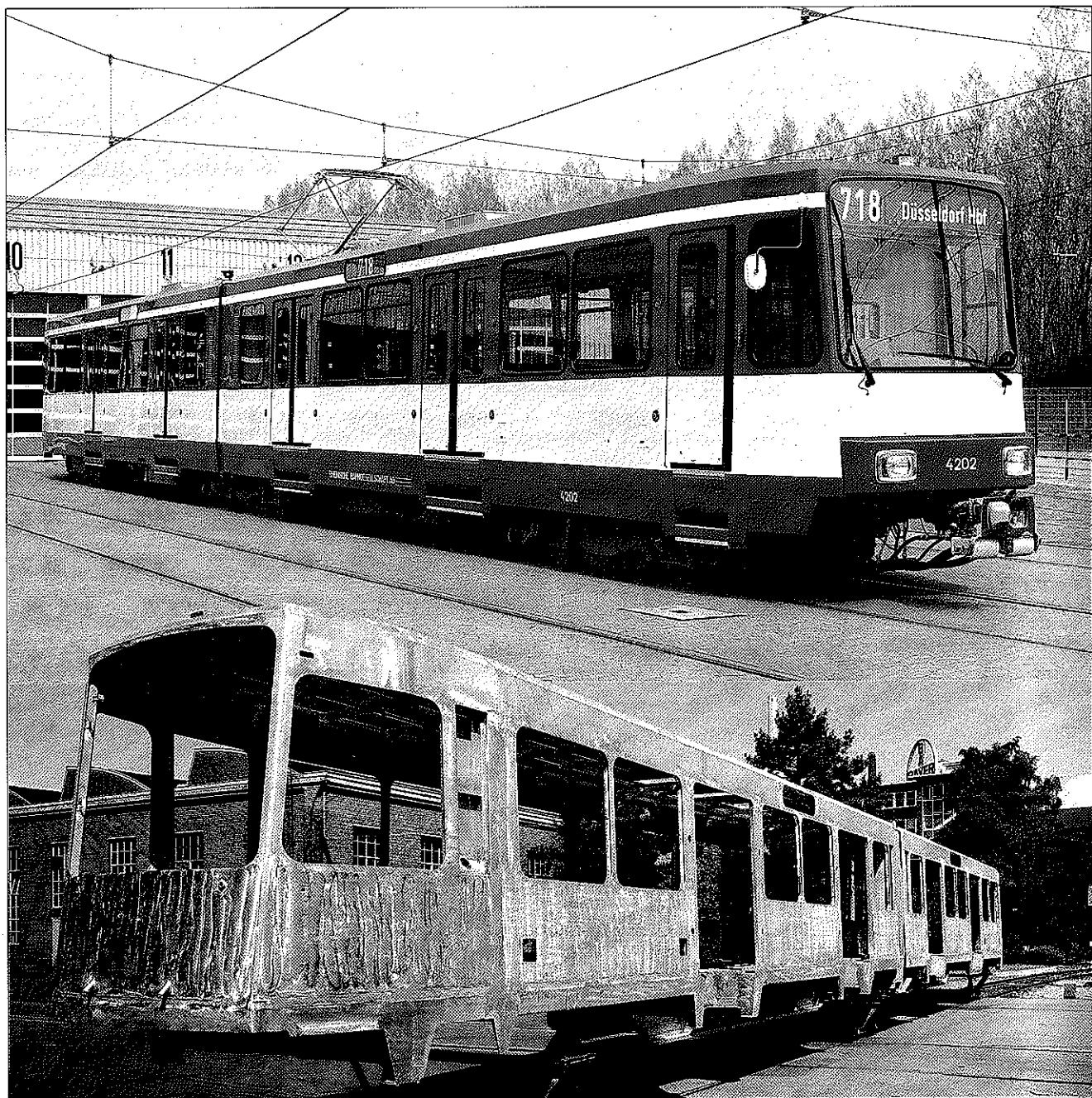
2746



DUEWAG

Light Rail Vehicle B 80 D

6-axle, double ended Light Rail Vehicle
of integral aluminum construction, with microprocessor
control and inverter fed 3-phase traction motors
and regenerative braking



Light Rail Vehicle B 80 D

Ventilation and heating

Fresh air is drawn from roof mounted vents and is equally distributed through ceiling incorporated air ducts. The hinged transom windows support the ventilation. Air outlets are provided in side wall ducts and seat boxes. Heating air is drawn in through air intakes in the articulation area and heated by line or recuperated energy. Thermostats control the heating system. The driver's cab is equipped with a demister system with additional ventilation features.

Doors

The DUEWAG folding doors for single and double door entries have door leaves made of light weight fiberglass. Door width is 1,300 mm for double and 700 mm for single doors, the door height is approx. 1,900 mm. The electro-mechanical door drives can be actuated by either the passengers or the driver. Safety devices include sensitive edges, photo-electric cells and step treadle switches.

Sanders

In front of each powered axle air operated sanders are provided. The actuation of these sanders is initiated by the electronic control or the driver. Sandboxes can be filled either from inside or outside of the car.

Compressed air system

The air system includes the compressor unit with air reservoirs and automatic drainage, spring applied air released brakes with relating controls and safety devices. The air system is electrically controlled and is also used for the secondary suspension system,

sanders, couplers, movable steps, mirrors, and the wheel flange lubricating system.

Couplers

Each car end is equipped with a pneumatically actuated self-centering coupler. A shock absorbing buffer gear is incorporated. The electric coupler is heated.

Miscellaneous equipment

Automatically controlled destination indicators with large lettering, public address system, train radio, train control equipment, emergency brake handles, screen wiper/washer and ticket validators are designed according to the state of art.

DUEWAG-bogies

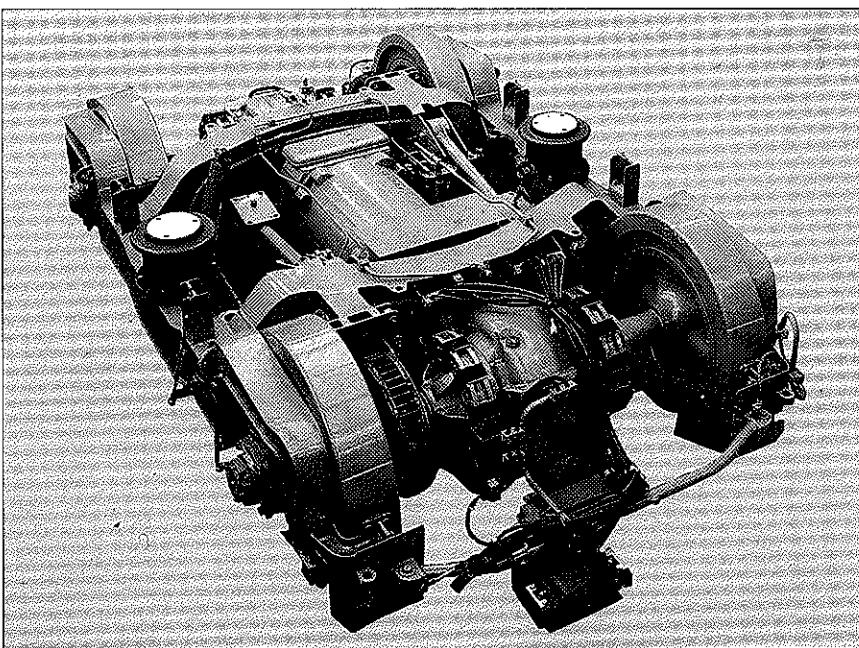
The bogies are a light weight fabricated steel design. The primary suspension is by chevron type springs. Air

springs are used as secondary suspension and also to transmit the lateral forces to the car body. Tie rods between the bogie and car body with silentblocks are provided for transmission of longitudinal forces between bogie and car body as well as vertical and horizontal shock absorbers.

Each motor bogie is equipped with a longitudinal propulsion unit type SIMOTRAC consisting of a 3-phase AC traction motor and two right angle gear boxes. This unit is resiliently supported on the two wheelsets by rubber block couplings. This DUEWAG-bogie concept provides optimal use of the adhesion also under unfavorable conditions because of the coupled wheelsets.

One brake disc is mounted on each axle; braking is provided by spring applied, air released brake actuators. Further components are a slip/spin device, life guards, fiberglass mud guards, and supports for ATC-equipment.

The non-powered bogie under the articulation follows the design principles of the powered bogies. It is also equipped with only one brake disc per axle.



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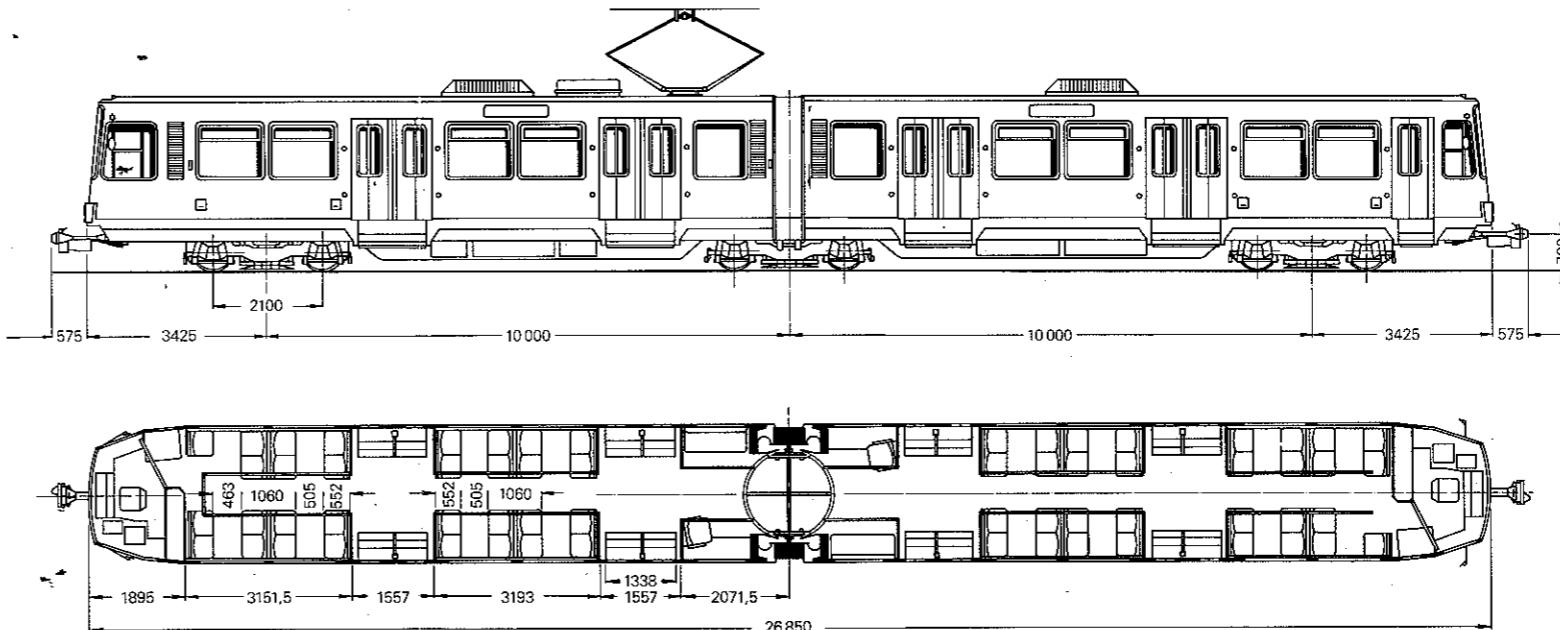
acceleration rate	1.1 m/s ²
service brake deceleration rate from 80 km/h	1.2 m/s ²
emergency brake deceleration rate with $\frac{2}{3}$ load	approx. 3 m/s ²
axle arrangement	Bx' (2) B' (4 powered + 2 unpowered axles)
track gauge	1,435 mm
bogies	DUEWAG-type mono-motor bogies with integrated propulsion unit type SIMOTRAC, air suspension and chevron type primary suspension
wheel diameter new/worn	740/660 mm (powered bogie) 710/660 mm (unpowered bogie)
traction motor performance	2 x 235 kW
max. service speed	80 km/h
car length over couplers	28,000 mm
car width	2,650 mm
car height over roof sheet	3,367 mm
floor height over TOR	1,000 mm
step raisers	340/220/220/220 mm with folding/sliding steps for high/medium and low platform boarding
weight empty	38,300 kg
adhesion weight	approx. 70%
capacity	70 seats and 80 standees (4 pass./m ²)
min. curve radius	25 m
● multiple unit operation up to 4 units	
● automatic train control	
● automatic train operation with continuous line wire control	

Development, design and manufacture of the mechanical part including bogies:

DUEWAG AKTIENGESELLSCHAFT

Electrical equipment: Siemens, BBC and Kiepe Elektrik

Overall development in cooperation with Rheinische Bahngesellschaft AG, Düsseldorf



This Light Rail Vehicle is designed for urban and interurban service. Thanks to the integrated folding/sliding steps, the LRV can be operated with high, medium and low level platforms thus allowing subway and surface operation. Car performances reflect these specific requirements.

Car body

To achieve the lowest possible car weight, the car body has been fabricated from aluminum by the so-called integrated construction method. Large size extruded sections with pressed-on equipment supports are used for constructing side walls, roof and floor to form a self-supporting unit for highest

passenger safety. Some of the side skirts can be folded up for easy access to the equipment boxes.

Articulation

The articulation is built to the proven DUEWAG design with a double ball bearing ring, silentbloc bearings, and bellows on all sides, allowing all required horizontal and vertical movements.

Insulation

Good acoustic and thermal insulation is achieved by cork based layers on the structural parts, mineral wool mats on the interior side walls, and a noise absorbing coat under the car floor. The floor itself is cushioned from the under-frame and covered with rubber material.

Interior design

Specially moulded reinforced fiber-glass sections are used for the interior wall lining, the ceiling is of the sandwich type design. Two continuous screen covered light fixture bands with adjacent equipment housings in the corners connect the ceiling with the side



wall. For safety and noise reduction considerations the articulation is covered by an attractive fiberglass lining.

Seats

Back-to-back double seats have separated seat and back rest cushions made of Neoprene and covered with vinyl. Arm rests are mounted on the side walls. The light weight seat frames are attached to the seat boxes. In each car half a special seat for handicapped people is provided adjacent to a door.

Windows

The side wall windows have tempered, tinted glass panes with a hinged transom window. The height of the windows complies with VÖV recommendations and thus guarantees good visibility for standees. The windscreens at each end of the car are made from convex, laminated safety glass.

Driver's cab

The driver's cabs at each car end are separated from the passenger compartment by equipment cabinets and a hinged door with built-in sliding window. Control elements are ergonomically designed. Good visibility, efficient ventilation, comfortable adjustable seats, pleasant colors, and easy access to equipment are noteworthy features of the driver's cabs.



Retractable steps

Boarding on all doors is possible from either high, medium and low platforms thanks to pneumatically operated folding/sliding steps with either one, two or four steps, which are operated by the driver or automatically in conjunction with the door control.