## 10 Technical Data

### GENERAL ENGINE DATA

| | Engine No. Up to NY 002030 | Engine No. From NY 002031 | Engine No. From ADB 000001 |
|---|---|---|---|
| Procedure | 4-stroke diesel with turbo-charging | 4-stroke diesel with turbo-charging | 4-stroke diesel with turbo-charging and intercooling |
| Engine Cooling | Water cooling | Water cooling | Water cooling |
| Number of Cylinders | 6 (in-line) | 6 (in-line) | 6 (in-line) |
| Bore/Stroke | 76.5/86.4 | 76.5/86.4 | 76.5/86.4 |
| Total Engine Displacement | 2383 $cm^3$ | 2383 $cm^3$ | 2383 $cm^3$ |
| Compression Ratio | 23:1 | 23:1 | 23:1 |
| Firing Order | 1-5-3-6-2-4 | 1-5-3-6-2-4 | 1-5-3-6-2-4 |
| Maximum Speed rpm uncharged | 4900 + 50 | 4900 + 50 | 4900 + 50 |
| Idling Speed appr. 60° Oil Temperature | 800 ± 50 | 800 ± 50 | 850 ± 50 |
| Rated Power kW (PS) | 77 (105) | 77 (105) | 83 (113) |
| at rpm | 4350 | 4350 | 4350 |
| Nominal Torque | 213 Nm | 213 Nm | 220 Nm |
| at rpm | 2400-2850 | 2400-2850 | 2400-2850 |
| Type of Fuel | Diesel fuel acc. to DIN 51601 | Diesel fuel acc. to DIN 51601 | Diesel fuel acc. to DIN 51601 |
| Charging Pressure | 0.64 - 0.72 bar | 0.64 - 0.72 bar | 0.80 bar |
| Compression Pressure | | | |
| New | 34 bar | 34 bar | 34 bar |
| Wear Limit | 28 bar | 28 bar | 28 bar |
| Max. Adm. Deviation between the Cylinders | 5 bar | 5 bar | 5 bar |
| Start of Delivery before TDC | | | |
| Static | | | |
| Set Value | 0.83 - 0.87 mm | 0.83 - 0.87 mm | 0.96 - 1.00 mm |
| Test Value | 0.78 - 0.92 mm | 0.78 - 0.92 mm | 0.91 - 1.05 mm |
| Dynamic at Idling Speed | 15° ± 1.5° | 15° ± 1.5° | 15,5° ± 1.5° |
| Injection Pump | Distributor injection pump with cold start accelerator and boost pressure enrichment | Distributor injection pump with cold start accelerator and boost pressure enrichment | Distributor injection pump with cold start accelerator and boost pressure enrichment |
| Injectors (Type) | Throttle and pintle-type injectors | Throttle and pintle-type injectors | Throttle and pintle-type inj. |
| Injectors Spraying Pressure (bar) | | | |
| New | 155 - 163 | 155 - 163 | 155 - 163 |
| Wear Limit | 140 | 140 | 140 |
| Camshaft Drive | V-belt drive | V-belt drive | V-belt drive |
| Valve Arrangement | OHC 1 intake and 1 exhaust valve per cylinder | OHC 1 intake and 1 exhaust valve per cylinder | OHC intake and 1 exhaust valve per cylinder |
| Valve Tappet Clearance | Des. value hot Des. value cold | Hydr. valve lash | Hydr. valve lash |
| Intake Valve | 0,20-0,30 mm 0,15-0,25 mm | | |
| Exhaust Valve | 0,40-0,50 mm 0,35-0,45 mm | | |
| Control Times at 1 mm Valve Lift and Tappet Clearance 0 mm | | | |
| Intake opens after TDC | 5° | 6° | 8° |
| Intake closes after BDC | 21° | 20° | 17° |
| Exhaust opens before BDC | 27° | 25,5° | 25° |
| Exhaust closes before TDC | 5° | 6,5° | 11° |

All the other Technical Data are the same for all Models.

### ENGINE LUBRICATION

| | |
|---|---|
| Lubricating System | Pressure circulating lubrication |
| Oil Pump | Internal geared wheel pump |
| Pump Capacity litres/min. | appr. 80 litres |
| Oil Filter | Filter cartridge, full flow filter |
| Oil Pressure at Idling (bar) min. | 0.5 bar |
| Oil Pressure at 2000 rpm (bar) min. | 1.2 bar |
| PCV opens at (bar) | 5.3 - 6.3 bar |

## ENGINE COOLING

| | | |
|---|---|---|
| Cooling Type | Pump circulated cooling with thermostat control | |
| Thermostat Type | Expansion-element thermostat | |
| Opening Temperature | acc. to country 71°, 80°, 87° | |
| Fan Drive | Visco-fan (rigid) | |
| Temperature for Connecting the Fan Drive | 72° | |
| Radiator Cap | Model A | Model B |
| Pressure relief valve opens (bar) | 1.3 + [01] | 1.0 |
| Suction relief valve opens (bar) | 0.93 | 0.93 |

## ELECTRICAL SYSTEM

| | |
|---|---|
| Electrical Installation | 12 Volts or 24 Volts |
| Dynamo | Alternator Bosch N1 14 V/90 A (12 V) or<br>N 1 28 V/55 A (24 V) |
| Starter | Bosch EV 12 V/2,2 kW or EV 24 V/2,5 kW |
| Batteries | 1 piece 12 V/88 Ah (12 V installation) or<br>2 pcs. 12 V/70 Ah (24 V installation) |
| **V-Belts** | |
| Steering Booster Pump | AV 13/12.5 x 1175 La |
| Dynamo - Fan | AV 13/12.5 x 1025 La |

## CLUTCH (only for gear change box)

| | |
|---|---|
| Design | Single dry plate clutch |
| Operation | Hydraulic |

## GEAR CHANGE BOX

| | |
|---|---|
| Design | Five speed gear box, fully synchronized |
| Model | ZF S 5-18/3 |
| Number of Gears | 5 forward gears, 1 reverse gear |
| Transmissions 1st Gear | i = 4.25 |
| 2nd Gear | i = 2.505 |
| 3rd Gear | i = 1.48 |
| 4th Gear | i = 1.0 |
| 5th Gear | i = 0.747 |
| Reverse Gear | i = 4.03 |

## AUTOMATIC GEAR BOX

| | |
|---|---|
| Design | Torque converter with secondary four speed gear box |
| Model | ZF 4 HP-22 |
| Number of Gears | 4 forward gears, 1 reverse gear |
| Transmissions 1st Gear | i = 2.73 |
| 2nd Gear | i = 1.56 |
| 3rd Gear | i = 1.0 |
| 4th Gear | i = 0.73 |
| Reverse Gear | i = 2.09 |

## TRANSFER GEARBOX

| | Model A (4x4 and 6x6) | Model B (optionally for 6x6) |
|---|---|---|
| Design | 2 speed, fully synchron. | 2 speed, fully synchron. |
| Transmissions: Road | i = 1.061 | i = 1.188 |
| Terrain | i = 2.452 | i = 2.746 |

## HEATING OR COOLING

The vehicle is equipped with a fresh-air heat exchanger integrated into the cooling circuit in the driver's cabin and an additional circulating air heat exchanger in the passenger's area. A special equipment for Northern countries consists in an additional water heating, which can also be operated when the engine is not working and will heat the cooling waTer. As soon as the water temperature has reached 50°C, the fan(s) will be connected. As soon as the water temperature has reached 75°C, the heating capacity will be halved.

### Additional Heating

| | |
|---|---|
| Design | Water heater |
| Model | Eberspächer D5W |
| Heat Flow | 5.0 kW |
| Fuel | Diesel fuel |
| Fuel Consumption | 0.6 l/h |
| Rated Voltage | 12 Volt |
| Power Consumption | 44 kW |
| Operating Pressure | max. 2.0 bar |

## AXLE DRIVES (front and rear axles)

By means of spiral bevel gears via bevel gear differential and axle drive shafts to the spur gear transmission situated in the axle drive housing.

| | |
|---|---|
| Transmission | i = 2.81 |
| Spur Gear Transmission | i = 2.231 |

## FRONT AXLE DRIVE

Drive by means of spiral bevel gears via bevel gear differential, axle drive shafts and homokinetic joint to the spur gear transmission situated in the axle driving housing. The front axle drive will be done by means of axle drive shafts via the differential change gear without joints. The axle drive shaft has a protected position by being situated in the central chassis axle tube. The front wheel drive can be pneumatically connected and disconnected by means of a toggle switch. When shifting to the terrain gear (on the transfer gear box), the front axle drive (all-wheel drive) will be connected automatically (control lamp on the toggle switch lights up).

## DIFFERENTIAL LOCKS

Available in each axle. Can be pneumatically connected during the drive individually or together. At Type 6x6, the locks of the two rear axles will be operated together.

## SUSPENSION OF WHEELS (tubular frame)

Single-wheel suspension of all wheels by means of full floating axles that are lodged in the axle housing and in which the axle drive shafts run safely.

## SPRING SYSTEM

Type 4x4:
Coil springs at the front and rear with additional rubber hollow springs acting progressively. Double acting hydraulic oscillation dampers, which are equipped with pneumatic additional springs on the rear axle. These elements serve to progressively adjust the level. The fully loaded vehicle will be lifted by increasing the system pressure so that the spring travel is preserved without restriction.

Type 6x6:
Coil springs at the front, two jointed longitudinal leaf springs at the rear. Additionally rubber hollow springs acting progressively. For each rear-axle shaft, there is a double acting hydraulic oscillation damper with a downward limitation of the travel of the spring system.

## BRAKING SYSTEM

### Foot Brake 4x4:

Hydraulic divided brake system with vacuum servobrake, device for limiting the braking power for the rear axle, disk brake at the front and rear.

| | |
|---|---|
| Total Surface of the Brake Lining | 576 $cm^2$ |

### Foot Brake 6x6:

Hydraulic divided brake system with vacuum servobrake, brake control unit for the rear axle, which depends on the load, disk brake at the front and rear.

| | |
|---|---|
| Total Surface of the Brake Lining | 768 $cm^2$ |

### Parking Brake

Mechanically operated divided brake system, which acts via the central axle drive shaft of the rear-axle drive on the rear wheels. If the front-axle drive is hooked up, it also acts on the front wheels. The front-axle drive will be switched on automatically if the engine is stopped.

## STEERING

| | |
|---|---|
| Design | Power-assisted ZF cam and roller steering gear with divided track rods and safety steering column |
| Transmission | i = 20 : 1 |
| Steering Wheel Revolutions | 4.3 from one stop to the other |
| Turning Circle Diameter 4x4 | 11.7 m |
| 6x6 | 13.5 mm |

## POSITION OF THE FRONT WHEELS

| | |
|---|---|
| Camber | depending on the load |
| Toe-In (measured on the rim flange) | 3 - 5 mm |
| Caster | 4° |
| Inclination | 8° |

**Tyres, Disk Wheel and Tyre Pressure**

| Tyres | Disk Wheel | Vehicle Type | Tyre Pressure in bar | |
|---|---|---|---|---|
| | | | Front Axle | Rear Axle |
| Goodrich LT 285/75 R 16 Load Range D | 7 J x 16 H2 | 4 x 4 Short | 3.0 | 2.5 |
| Michelin 8.25/R 16 C XZL ** | 6 J x 16 H2 | 4 x 4 M | 2.8 | 2.8 |
| | | 4 x 4 K | 3.5 | 3.5 |
| Semperit 235/85 R 16 RF | 6 J x 16 H2 | 4 x 4 T | 3.5 | 3.5 |
| Semperit 7.50 R16C Gigant Steel PR8, M | | | | |
| Michelin 7.50 R16C XCL, PR8, L | | 4 x 4 M | 3.5 | 3.5 |
| Michelin 7.50 R16 XSF, PR6 | | | | |
| Good Year 7.50 R16 Wrangler PR 6, M | | 4 x 4 K | 3.5 | 3.5 |
| General Tire 235/85 R16 LT Ameri Grip, PR8, M | | | | |

| Tyres | Disk Wheel | Vehicle Type | Tyre Pressure in bar | | |
|---|---|---|---|---|---|
| | | | Front Axle | Centr. Axle | Rear Axle |
| Semperit 235/85 R 16 RF | 6 J x 16 H2 | 6 x 6 T | 3.5 | 3.0 | 3.0 |
| Semperit 7.50 R16C Gigant Steel PR8, M | | | | | |
| Michelin 7.50 R16C XCL, PR8, L | | 6 x 6 M | 3.5 | 3.0 | 3.0 |
| Michelin 7,50 R16 XSF, PR6 | | | | | |
| Good Year 7.50 R16 Wrangler PR 6, M | | 6 x 6 K | 3.5 | 3.0 | 3.0 |
| General Tire 235/85 R16 LT Ameri Grip, PR8, M | | | | | |
| Michelin 8.25/R16C XZL ** | 6 J x 16 H2 | 6 x 6 M | 3.5 | 3.0 | 3.0 |
| | | 6 x 6 K | 3.5 | 3.5 | 3.5 |
| Semperit H-Grip 225/75 R 17.5 * | 17.5 x 6.75 H | 6 x 6 T | 3.5 | 3.5 | 3.5 |
| | | 6 x 6 M | 3.5 | 3.5 | 3.5 |
| | | 6 x 6 K | 3.5 | 3.5 | 3.5 |

* Only Austrian Army
** Only England

## Designations of Disk Wheels and Tyres

### Designations of Disk Wheels

Example: 6 J x 16 H2

Rim Width in inches
Identif. Letter for Height and Contour of the Rim Horn
Identif. for One-Piece Drop Base Rim
Rim Ø in inches
Rim with Double Hump

### Designations of Tyres

Example: 205 R 16 reinf. 104 S

Identif. for Nominal Width of the Tyre in mm
Radial Tyre
Rim Ø in inches
Reinforced Tyres
Load Index of the Tyre - 900 kg
Identif. for Speed up to 180 km/h

### Additional Designations of Tyres

PR = Ply Rating, index for the stability of the carcass, gives information on the load capacity of the tyre.
C = C Tyres, are also used for light lorries
M + S = Slush and snow tyres
XC = Load capacity of appr. 5%

### Manufacturing Index

The three-digit Manufacturing Index is situated at the end of the sequence of letters and numerals placed in the heel area of the outer tyre flanks and starting with DOT.

Example: 019 (1st week 1989)

**Load Index**

**Load Index Table**

| LI | kg | LI | kg |
|---|---|---|---|
| 100 | 800 | 110 | 1060 |
| 101 | 825 | 111 | 1090 |
| 102 | 850 | 112 | 1120 |
| 103 | 875 | 113 | 1150 |
| 104 | 900 | 114 | 1180 |
| 105 | 925 | 115 | 1215 |
| 106 | 950 | 116 | 1250 |
| 107 | 975 | 117 | 1285 |
| 108 | 1000 | 118 | 1320 |
| 109 | 1030 | 119 | 1360 |

**Speed Symbols**

| Speed | | Speed | |
|---|---|---|---|
| km/h | | km/h | |
| J | 100 | R | 170 |
| K | 110 | S | 180 |
| L | 120 | T | 190 |
| M | 130 | U | 200 |
| N | 140 | H | 210 |
| P | 150 | V | 240 |
| Q | 160 | | |

## CHASSIS

Consists of a central pipe, on which the front-axle drive is flanged at the front and the differential change gear with the rear-axle drive or rear-axle drives at Type 6x6 is flanged at the rear, and the full floating axles. Behind the front-axle drive and in front of the rear-axle drive, crossbeams for supporting the bodywork are mounted (Type 4x4). Type 6x6 has a short axle tube between the rear axles. This axle tube also serves as spring carrier for the longitudinal leaf springs as well as support for the bodywork. On the axle drive housings, box-type bodies are flanged on the opposite side of the axle tube. These bodies also bear the trailer eye at the front and the hand brake at the rear, the towing equipment as well as the rubber bearings supporting the bodywork. The coil springs and oscillation dampers for the single-wheel suspension of the wheels are directly mounted on the bodywork of the vehicle.

## BODY

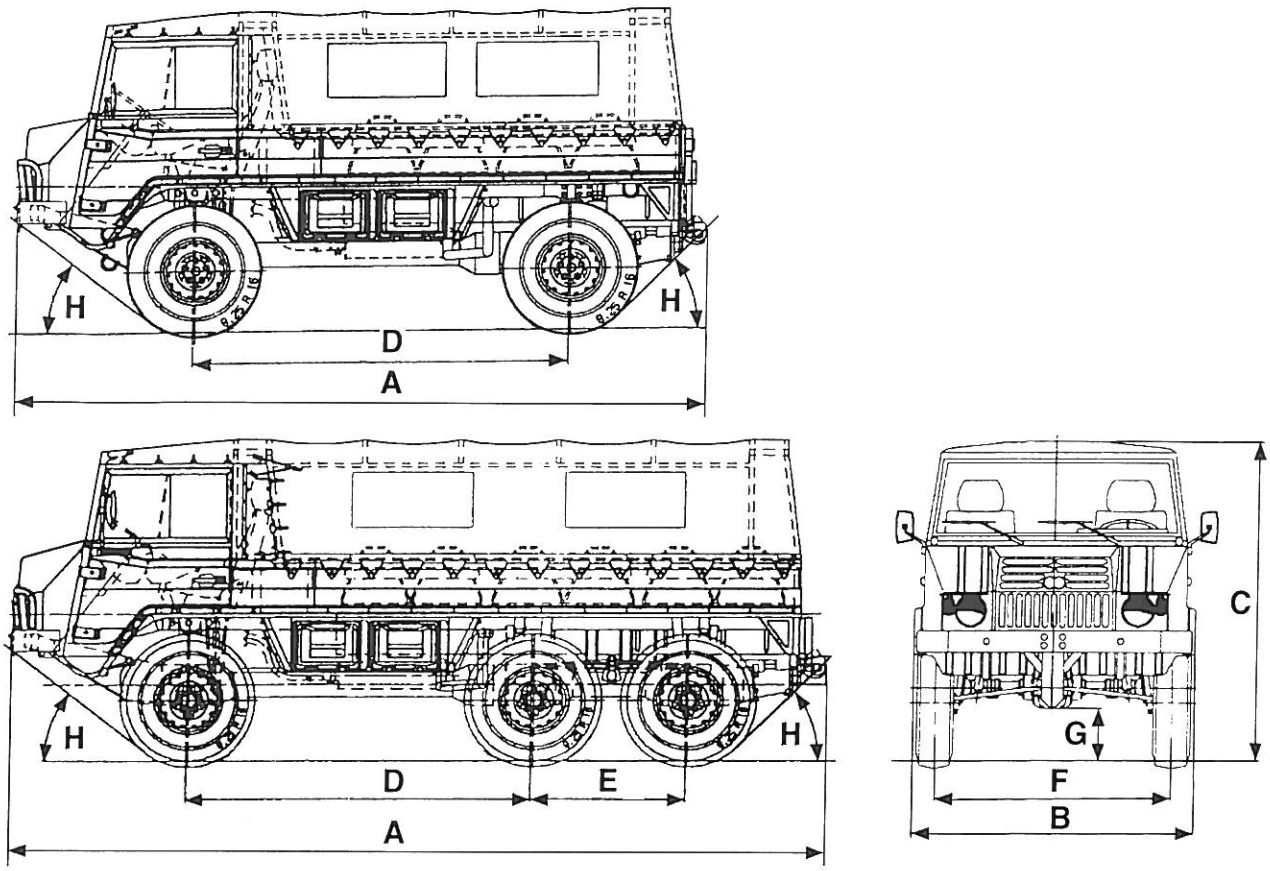
Steel sheet bodywork with cavities in the area of the entrances, at the doors and in the footwell of the seats. Below the floor or plateau, there are closed boxes for two batteries, tools and fuel.

Type 4x4 M (Type 6x6 M)
The bodywork has two front doors with sash windows and a tail gate without a door top. The floor of the loading space has a longitudinal width between the rear wheels of 825 mm and is immerged.

By folding over the back rests and the seats, a continuous loading area will be formed. Platform gates screwed on the sides and beside the tail gate limit the loading area by the fixed front transverse platform gate.
Behind the front doors and at the tail resp., a strong canopy top, which has a width of appr. 30 mm and has the shape of an overroll bar, is screwed on.
The canopy top covers the entire loading area, can be buttoned and unbuttoned and can be rolled up on the side. The tail top, which can be rolled up and has a window, covers the entire width of the vehicle.

Type 4x4 K (Type 6x6 K)
The bodywork has two front doors with sash windows, two side doors with sash windows and a tail gate with a window top. All doors are lockable.
The floor of the loading area is T-shaped, i. e. recessed between the side doors and rear wheels up to the tail gate. Between the side doors, three single seats, which are not adjustable and have a rest that can be folded over, are mounted facing the engine. Between the front and side doors, side platform gates are fixed to the transverse platform gate. Behind the side doors and beside the tail gate, platform gates are screwed on. A welded steel sheet top is tightly screwed on the windscreen frame and on the platform gates and covers the entire vehicle. In the areas above the seats, the roof has the shape of an overroll bar and is reinforced by means of a corresponding strutting.

## MAIN DIMENSIONS




| | Base Models | 4x4 Short mm | | 4x4 T/M/K mm | | | 6x6 T/M/K mm | | |
|---|---|---|---|---|---|---|---|---|---|
| | | P 90 | P 93 | P 80 | P 90 | P 93 | P 80 | P 90 | P 93 |
| A | Length w/o rope winch and spare wheel | 4068 | 4078 | 4303 | 4348 | 4358 | 5083 | 5128 | 5138 |
| B | Width w/o exterior mirror | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 | 1800 |
| C | Height w/o luggage carrier, air conditioner and roof lid | 1965 | 1965 | 2045 | 2045 | 2045 | 2045 | 2045 | 2045 |
| D | Wheel base | 2200 | 2200 | 2400 | 2400 | 2400 | 2200 | 2200 | 2200 |
| E | Wheel base | | | | | | 980 | 980 | 980 |
| F | Tread width, front and rear | 1520 | 1520 | 1520 | 1520 | 1520 | 1520 | 1520 | 1520 |
| G | Ground clearance | 335 | 335 | 335 | 335 | 335 | 335 | 335 | 335 |
| H | Overhang angle, front and rear | 37/35° | 36/35° | 38/45° | 37/45° | 36/45° | 38/45° | 37/45° | 36/45° |

## WEIGHTS

| | |
|---|---|
| Admissible Total Weight | see Type Plate |
| Admissible Total Traction Weight | see Type Plate |
| Admissible Axle Load, front axle | see Type Plate |
| Admissible Axle Load, first rear axle | see Type Plate |
| Admissible Axle Load, second rear axle | see Type Plate |
| Admissible Roof Load | max. 300 kg with roof luggage carrier |
| No Roof Load above the Driver's Cabin | |

| FUEL CONSUMPTION | 4 x 4 | 6 x 6 |
|---|---|---|
| Road litres/100 km (acc. to DIN 70030) | 15.2 | 16.6 |
| Terrain litres/h (depending on the terrain) | 6 - 10 | 8 - 10 |

| DRIVING CAPACITY | 4 x 4 | 6 x 6 |
|---|---|---|
| Maximum Speed (acc. to DIN 70020) | max. 125 km/h | max. 115 km/h |
| Hill Climbing Ability (solid ground) | up to the limit of road adherence | |
| Fording Depth | 700 mm | 700 mm |