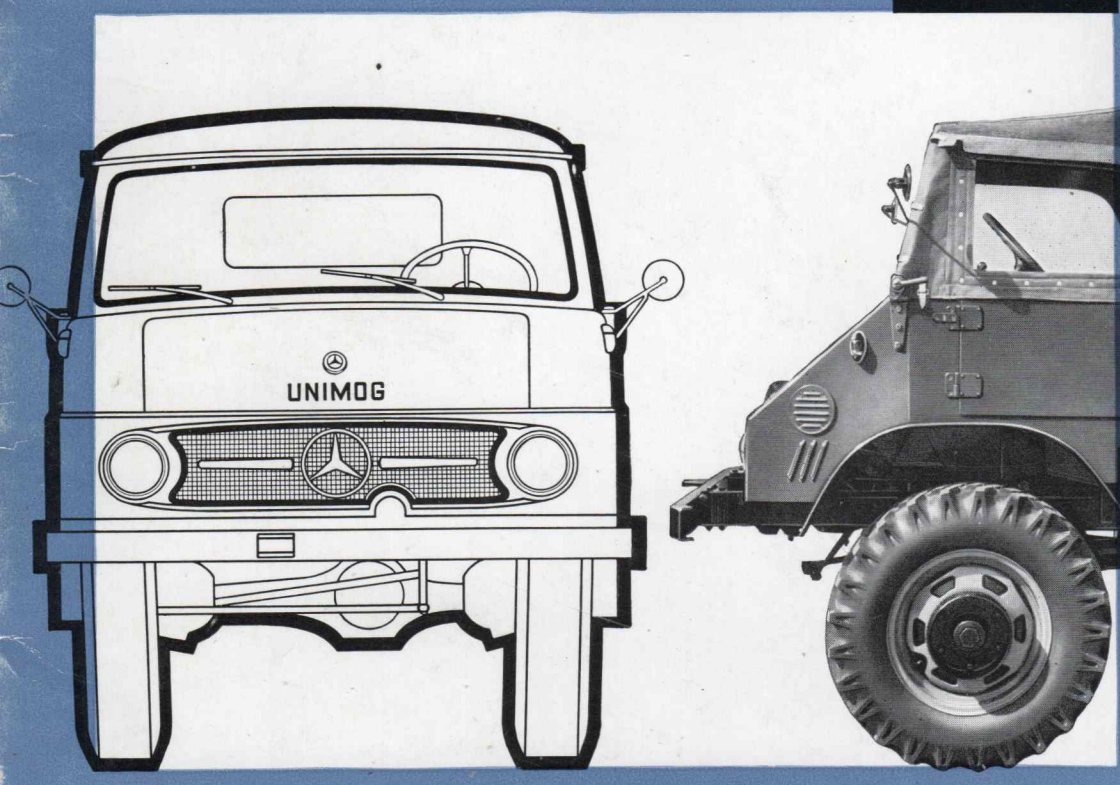
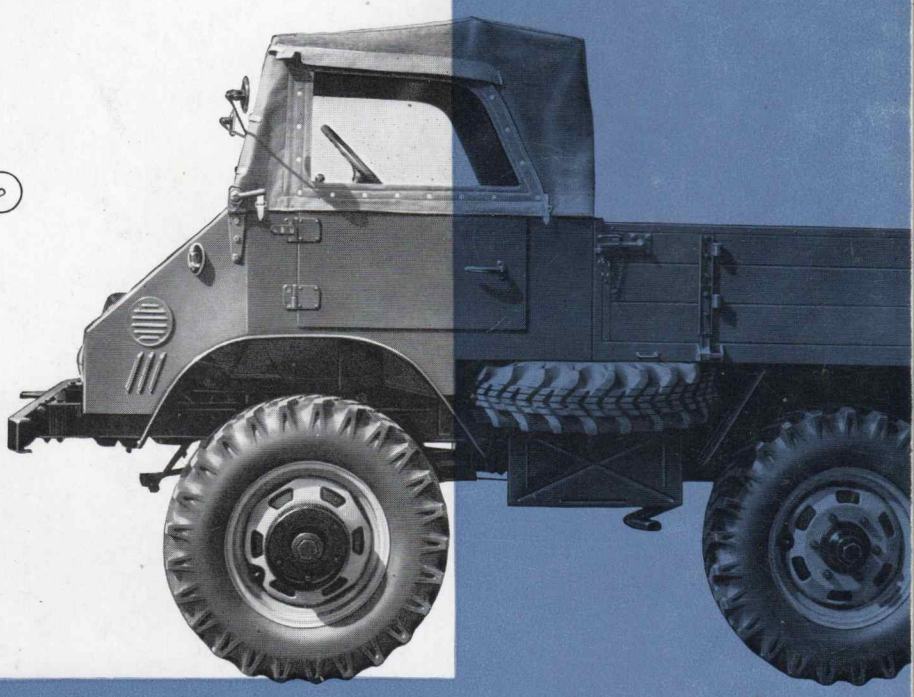
UNIMOG





MERCEDES-BENZ

UNIMOG makes hard work easy

The Unimog is a strong, cross-country agricultural tractor and at the same time a powerful and maneuverable all-purpose road tractor with power drives possibilities for mounted equipment front, side, and rear. In addition, it has an auxiliary platform for mounting equipment. Its standard cab is equipped with two seats. This means that the Unimog can be used everywhere – in any enterprise, for any job, and in any season.

The Unimog's versatility is due to its unique design which is not based on conventional data, but on the demands of today's mechanization techniques.

The correctness of this idea and the consistency with which it was realized are illustrated by three facts:

The Unimog has remained practically unchanged in design for more than ten years and today is as modern as ever.

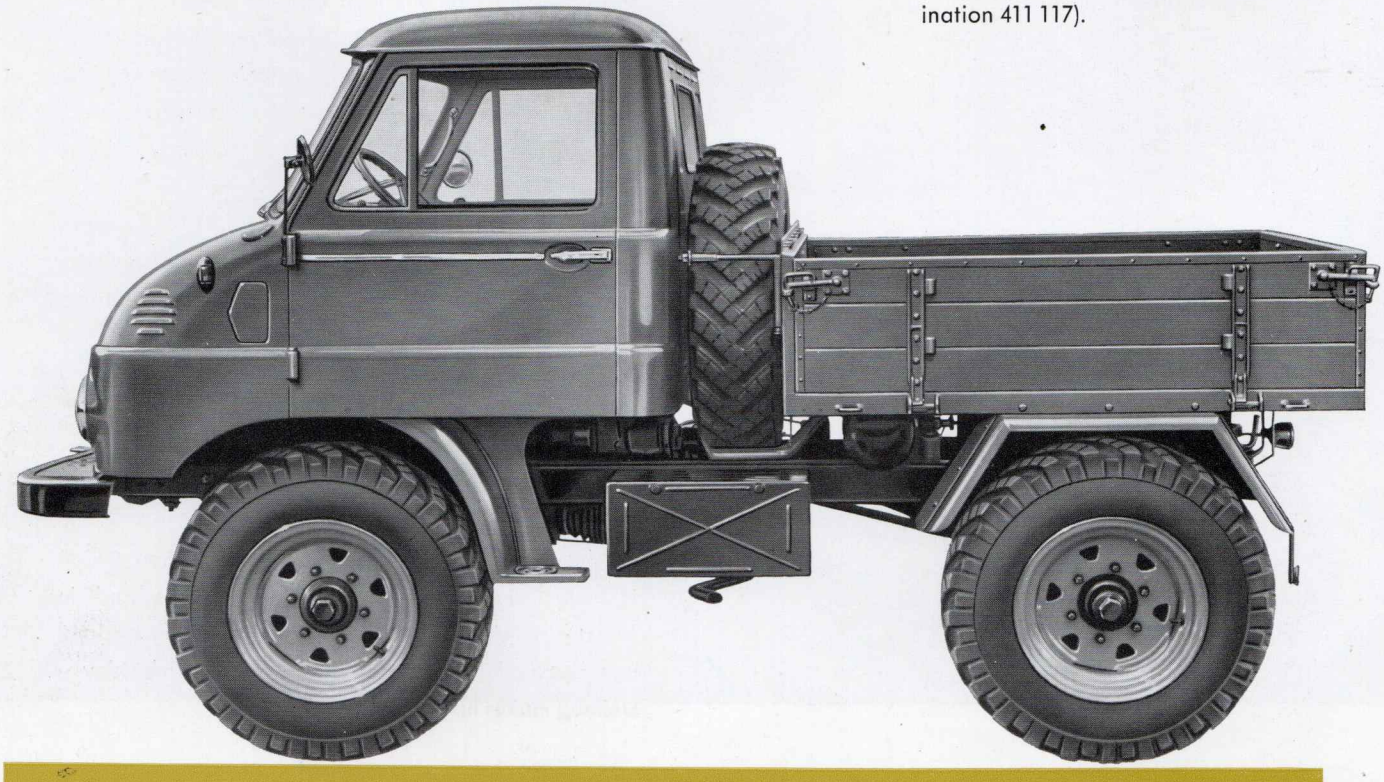
The Unimog has received countless honors in the most difficult tests: The "Silver Medal of the DLG," the highest award of the German Agricultural Association (Deutsche Landwirtschafts-Gesellschaft), the seal of "Quality Stamp by the German Forestry Engineers Committee," the "Medal of the Central Association of Vegetable, Fruit, and Garden Culture" (Zentralverband des Deutschen Gemüse-, Obst- und Gartenbaues), and the "Commemorative Medal from the Rationalizing Exhibition in Düsseldorf."

But use provides the best proof: More than 30,000 Unimogs are in use today in agriculture and in forestry, serving various trades, industrial plants, and municipal administrations. These prove day by day – Unimog makes hard work easy.

Even the exterior of the Unimog is unusual: Not an intentionally modern design, but rather one strictly motivated by practicality.

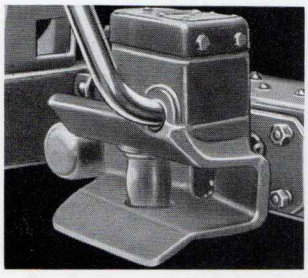
The Unimog is available in three different models: With detachable, all-weather cover and a wheel base of 67.6 in. (1720 mm.) it is used in agriculture and forestry (model denomination 411 110).

With all steel cab and a wheel base of 83.4 in. (2120 mm.) this model is useful in municipal work, in industry, and in various trades (model denomination 411 117).



For special tasks a third model with a detachable cab cover and also a lengthened chassis, wheel base 83.4 in. (2120 mm.), is available (model denomination 411 112).

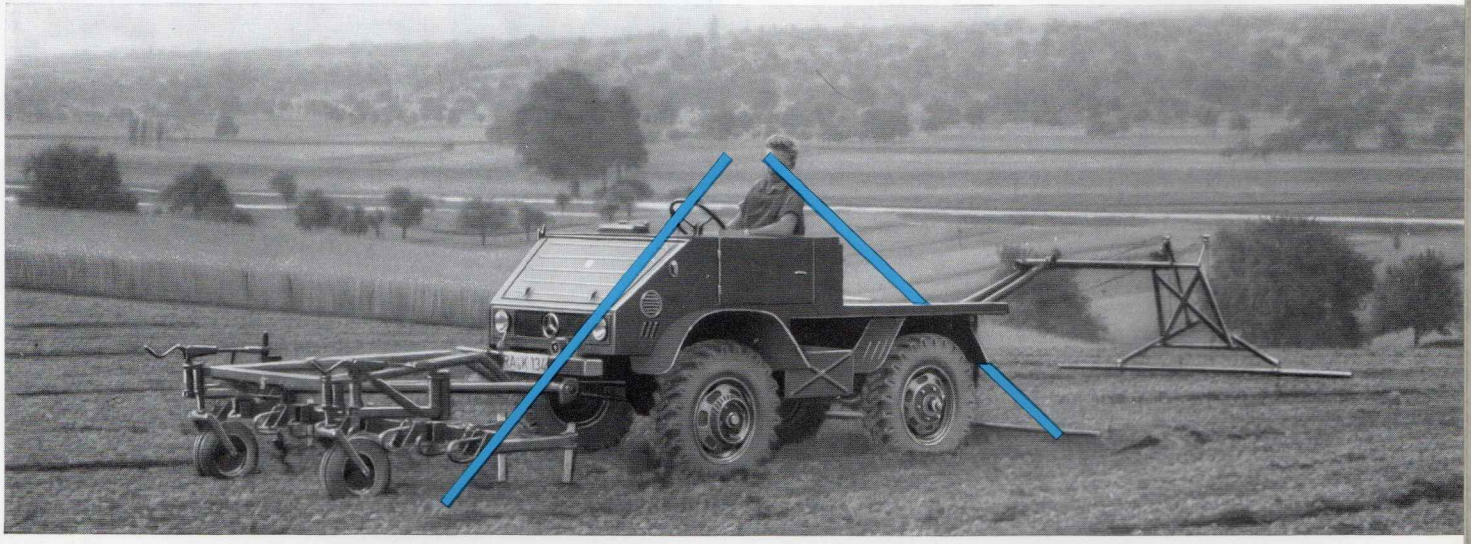
Both types of the Unimog driver's cabs offer more than is customary with tractors. The all-weather cover encloses the cab completely and protects the driver in any weather. The cover and the windshield are folded down or removed completely without waste motion for field work or in hot summer weather. The all steel driver's cab offers the comfort which is customary in modern commercial vehicles: wide doors, mounting steps and handles, adjustable seats, and a panorama windshield.

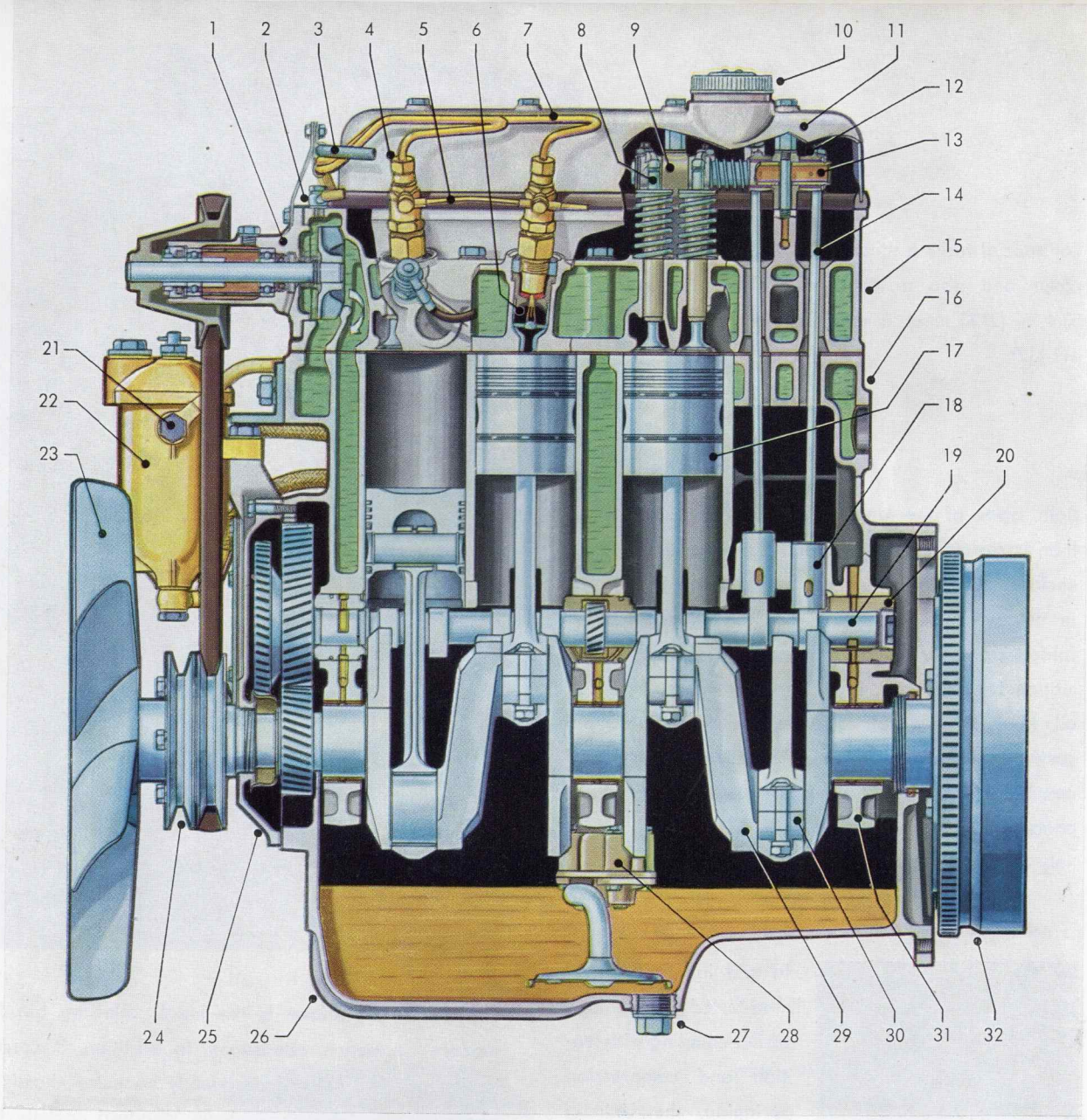


In addition to the Unimog-tested automatic trailer coupling with tension and compression springing, the Unimog has a coupling mouth on the front bumper.

The auxiliary platform is the ideal collecting bin for modern harvesting operations. In addition, it carries implements for which consequently no extra chassis is necessary. The side walls have standard sockets for detachable extension boards.

For work with trailing or attached equipment the side walls and insert-type floor can be removed, giving the driver a clear front and rear view of the implements in operation.





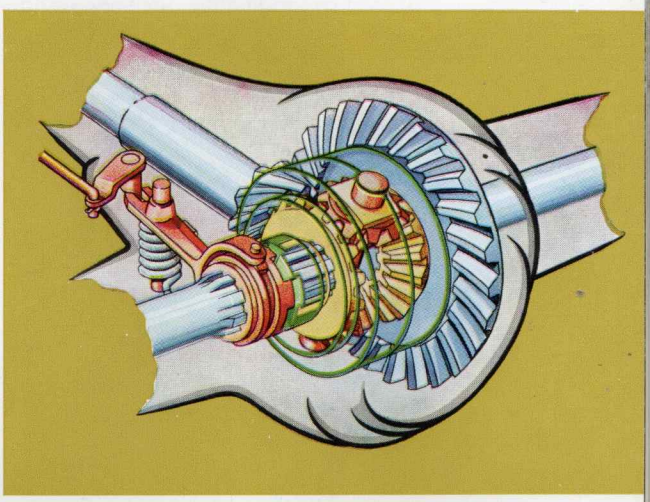
Description of cross section of engine OM 636 – VI

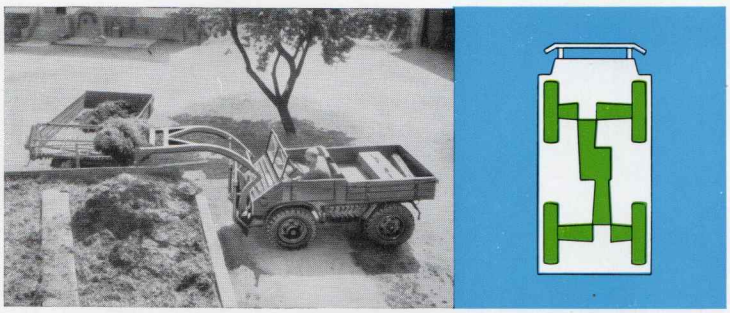
1. Water cooling pump · 2. Vent line · 3. Low pressure duct · 4. Fuel injection nozzle · 5. Fuel leakage pipe · 6. Pre-combustion chamber · 7. Fuel pressure line · 8. Exhaust valve · 9. Rocker arm support · 10. Oil filler · 11. Cylinder head cover · 12. Rocker arm · 13. Rocker arm shaft · 14. Push rod · 15. Cylinder head · 16. Cylinder crank case · 17. Piston · 18. Valve tappets · 19. Camshaft · 20. Camshaft bearing · 21. Overflow valve · 22. Fuel filter · 23. Fan · 24. Air compressor drive · 25. Timing gear case cover · 26. Oil pan · 27. Oil drain screw · 28. Oil pump · 29. Crankshaft · 30. Connecting rod · 31. Crankshaft bearing cover · 32. Flywheel.

The sturdy Mercedes-Benz four-cylinder engine OM 636 has been out of the experimental stage for many years. Hundreds of thousands of these engines have been built since then. The engine works by the successful Daimler-Benz direct flow pre-chamber system. Consequently it has good pick-up, great flexibility, runs quietly, and is satisfactory in consumption under any load. Another advantage of the OM 636 is its thermostatically controlled cooling system. It holds the engine at exactly the right operating temperature – an important prerequisite for dependable work and lasting service.

The Unimog engine can never be overstrained even when in continuous operation at full load, for it is limited to an output of 32 H.P. at 2550 r.p.m., while in the automobile 180 D it puts out 43 H.P. at 3600 r.p.m. This tuning for robust tractor operation increases even more its economy and durability. An operation hour counter is standard equipment on Unimog engines.

Both axles are equipped with differential locks. Thus all four wheels can be connected rigidly with one another and with the transmission. So, each wheel can bring the entire engine power to the ground even when the other three have not sufficient adherence. With the differential locks in operation, the Unimog can master steep inclines, oiled surfaces, and icy areas. The differential locks reduce slip and thereby avoid useless fuel consumption and tire wear.

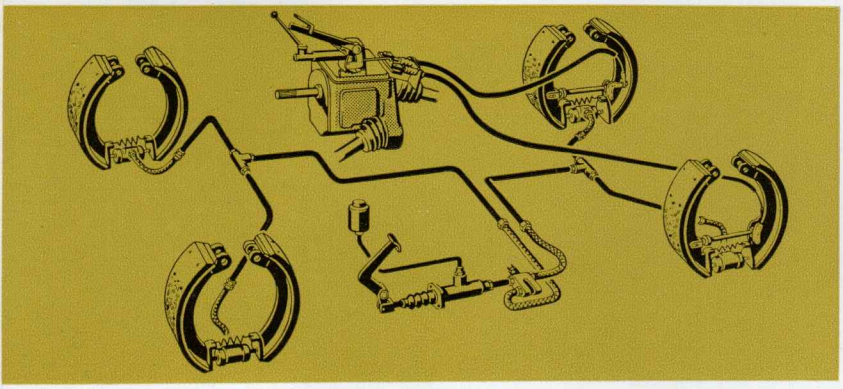


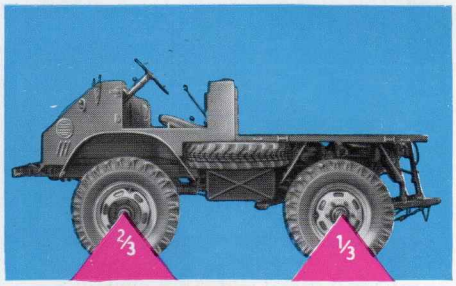


The Unimog can travel on roads at over 30 m.p.h. (50 km.p.h.); on the other hand, in difficult situations, its entire engine output is used for traction. This advantage is due to a low center of gravity, true four-wheel drive, favorable weight distribution, and the equal size of its four wheels.

For traffic with light loads the rear axle drive will do. When working with implements four-wheel drive is generally used. For heavy hauling work, both differentials are locked.

Two thirds of the Unimog's weight is on the front axle, one third on the rear axle. Consequently, the Unimog is safe to steer in heavy hauling even on steep hills and does not rear. Adherence and tractive power can be further increased by loading the auxiliary platform.

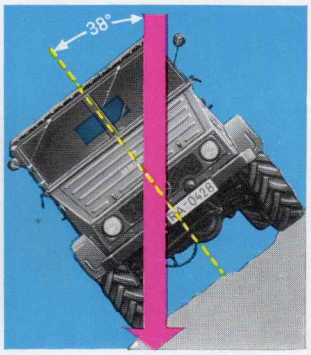


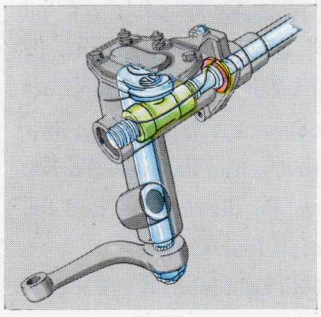


The Unimog has a hydraulic four-wheel foot brake; its hand brake works mechanically on the rear wheels. The compressed-air brake assembly provided for operation with a trailer is automatically controlled by the hydraulic brakes. This braking system offers a high degree of safety even at high speeds.

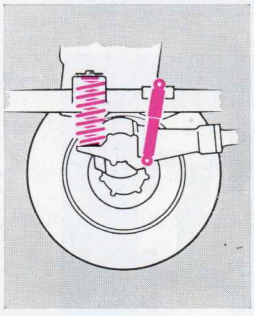
The Unimog has a ground clearance of 18.1 in. (46 cm) under the axles and 14.9 in (38 cm) under the differentials – a great advantage for work with green crops, in the forest, or in open terrain. Nevertheless, a low center of gravity gives it an exceptional stability: its tipping angle is almost 40 degrees.

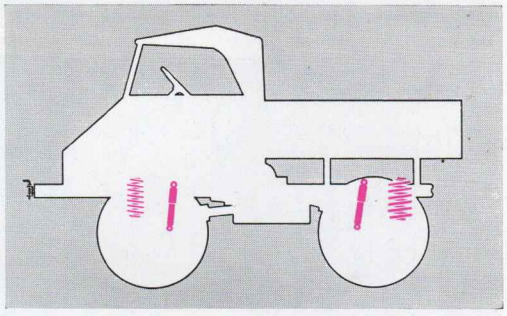
With the four-wheel drive, turning – even on uphill slopes – becomes a simple process, for the front wheels can pull the Unimog in the new direction.





The steering is very sensitive, and requires but a slight effort in steering, owing to a high gear ratio.

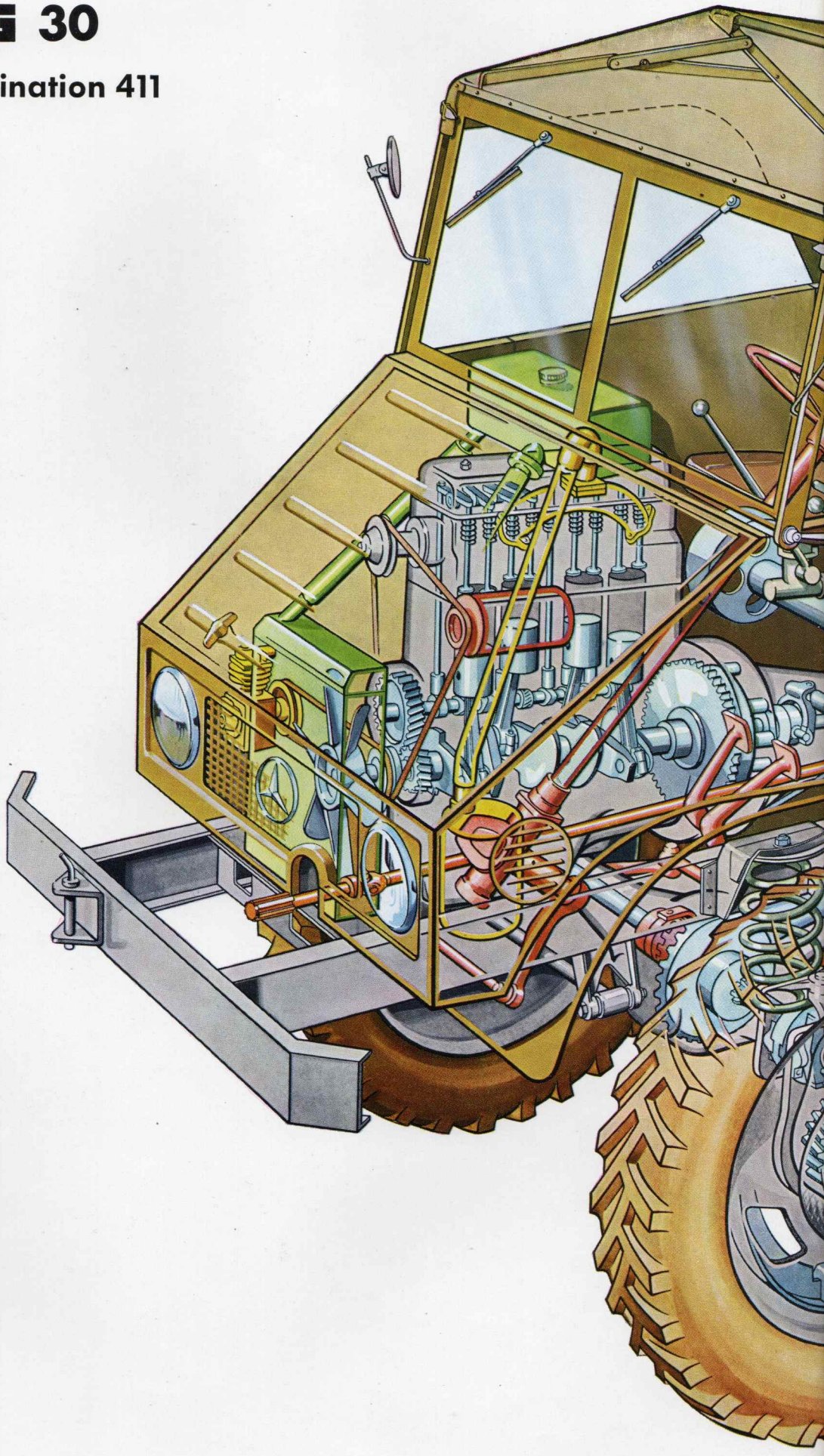


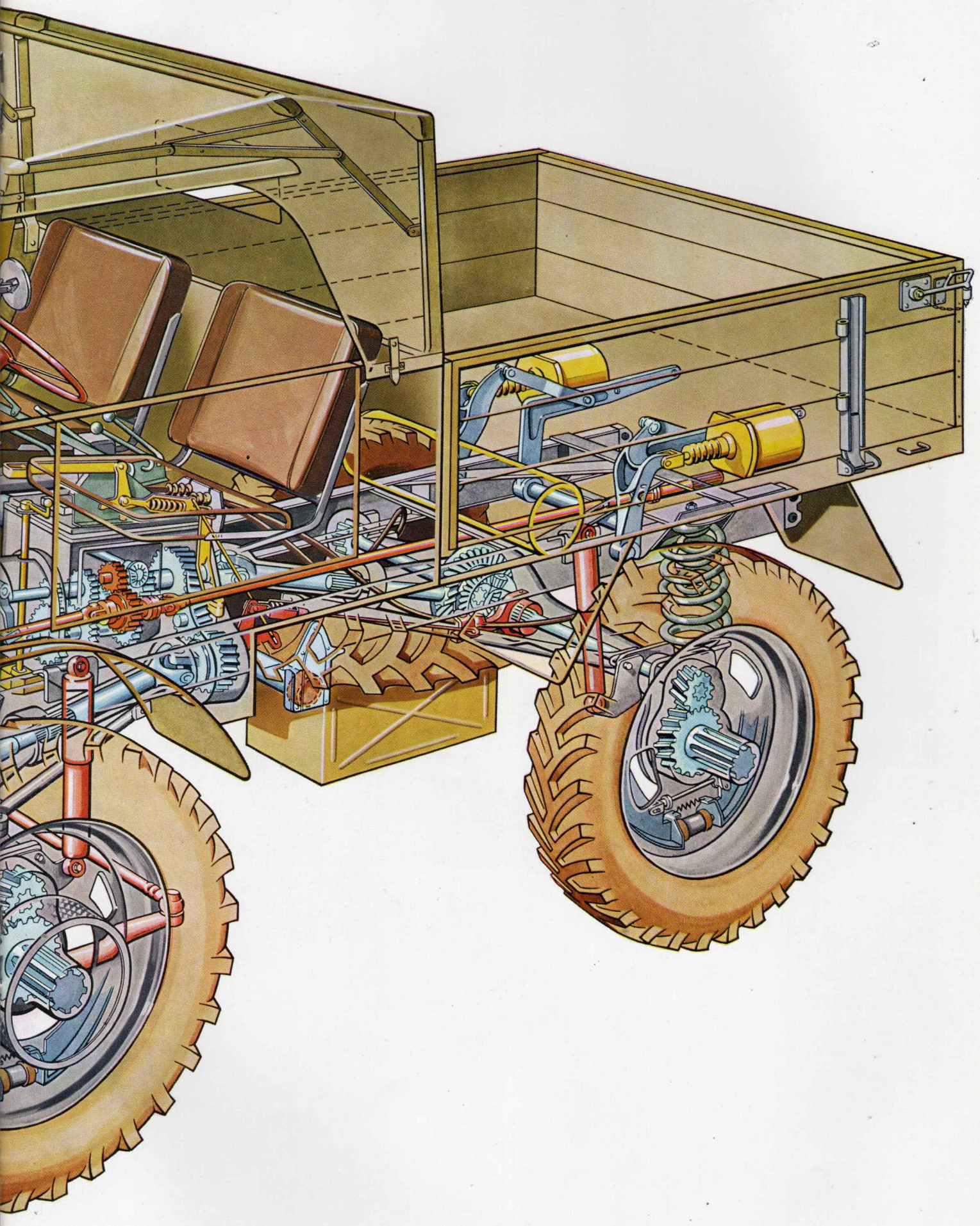


The Unimog has coil springs with high deflection on both axles; this gives the wheels good adherence even over the roughest terrain. These coil springs offer a major advantage in that they require no maintenance at all. Two double duty telescopic shock absorbers on both the front and rear axles minimize bumps and spring vibration. This springing system spares the vehicle, the load, and also the driver – whether driving fast or slow, with or without a load, on the road, in the field, or even over open terrain.

UNIMOG 30

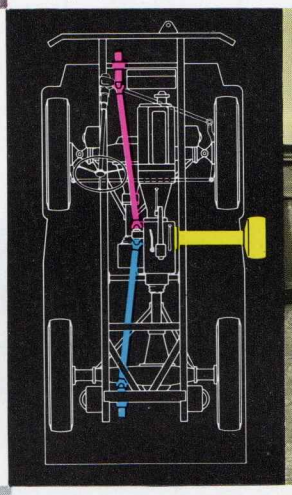
Model denomination 411



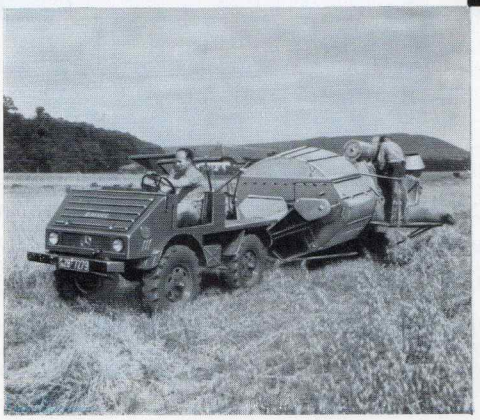



UNIMOG
RA-H 541

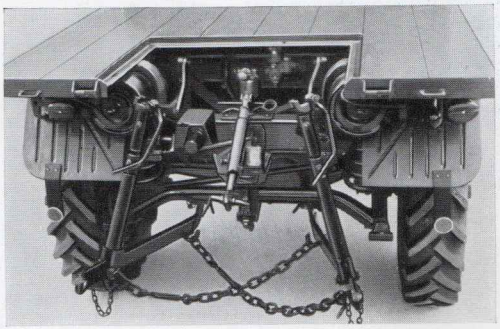
The Unimog has three power drives – the front power take-off, the rear power take-off, and the belt pulley on the right side. At full engine speed, 35 H.P. at 540 r.p.m. is available for the power drives. The front power take-off is used e.g. for mowers, cable winches, compressed air equipment, generators, pumps, and drills.

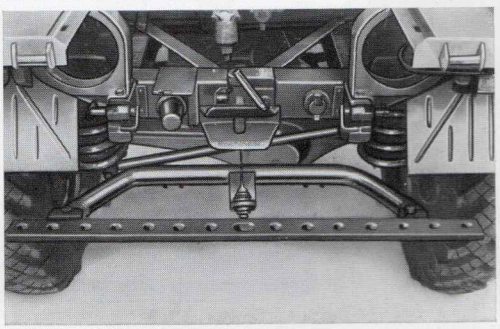


The belt pulley serves to drive stationary machines, equipment mounted on the auxiliary platform, and the roller-type side wall.

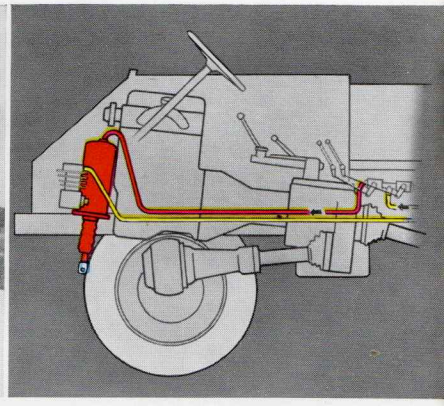


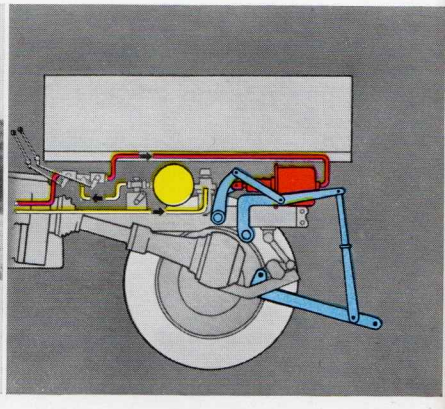
The rear power take-off drives trailed equipment for hay, grain, and root crop harvesting as well as implements mounted on the auxiliary platform. For driving some special pieces of equipment there is an intermediate drive on the rear power take-off beneath the auxiliary platform.





Implements are mounted on a three-point linkage according to international standard. Of course, two-point or four-point linkage can also be used with the Unimog. For trailer-type agricultural equipment there is a tool bar.

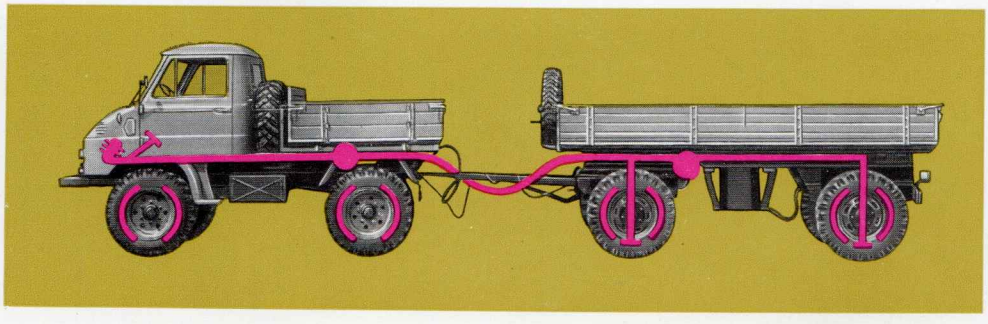


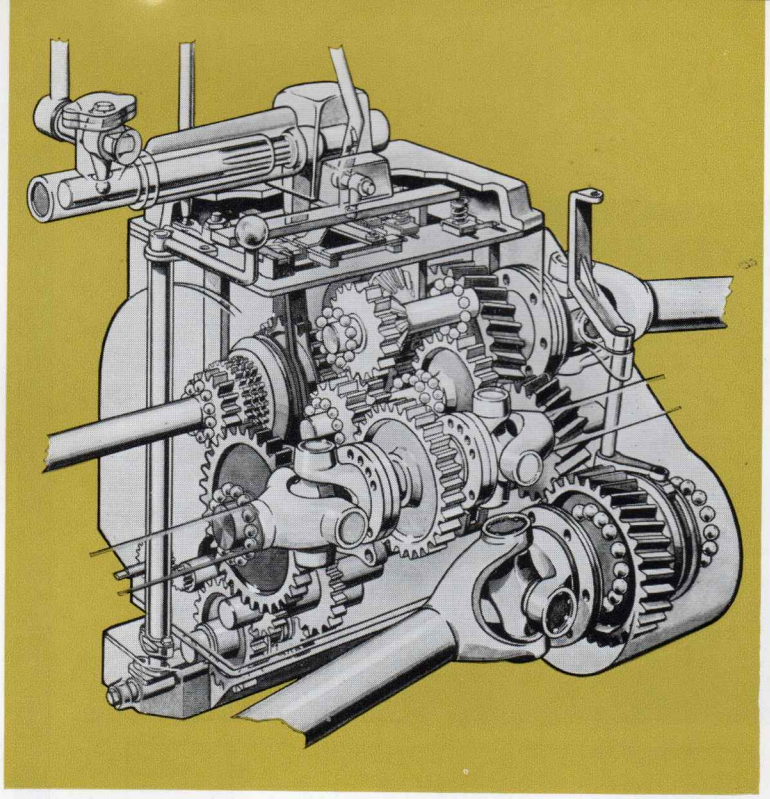


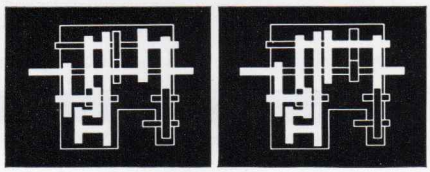
Front and rear power lifts are operated by the compressed-air installation. They can be controlled either individually, simultaneously, or sequentially. The operating lever is situated directly beside the driver's seat.

A two-side tipping platform has been designed for rapid unloading of bulk goods and modern harvesting operations. An automatic self-opening and closing drop-type side wall further expedites unloading. For direct transference to a trailer, particularly of root crops from the Unimog collection bin, there is a roller-type side wall. It is put in operation automatically, on tipping.

The compressed-air assembly serves the power lifts, the tipping platform, and the trailer brakes. It can also be used for tipping trailers, filling tires, or even for paint spraying. With the compressed air trailer brake system, even heavy trailers can be hauled safely at high speed.



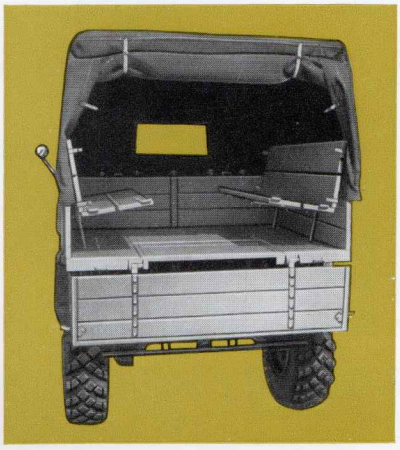




The Unimog is supplied with a fully synchronised transmission which is quick and easy to operate.
An auxiliary transmission for crawling gear can be supplied on request, further increasing the Unimog's speed range to a minimum of 820 ft. (250 m) per hour, a working speed that is indispensable, e.g. for beet thinning.

In the all-steel driver's cab a heater permitting exact regulation can be installed. After turning off the heat exchanger, it works also for ventilation. Through slits over the windshield and on the sides fresh air is conducted into the cab. There are circulation vents above in the rear wall of the cab.
A mileage counter can be installed at the left in the foot room of the cab.

To protect the engine from heavy dust, an exhaust pipe with rain cover or with "cyclone" prefilter is supplied.



For personnel transport, the platform of the Unimog can be equipped with detachable seats and backrests and with a canvas top.

Cage wheels with quick fasteners further increase the contact surface on soft terrain.

Selection of appropriate tire sections and sites is particularly important for the transmission of the Unimog's tractive power to the ground. The Unimog is supplied with low pressure tires either 7.50–18 or 10–18. The standard tires have a section that is equally appropriate for forest, field, or road. For extreme terrain conditions a series of special sections is available.

The economy of the Unimog is based on its versatility and on its great efficiency for each particular job. With its supplementary equipment the Unimog can be used all the year round. Thus the manifold applicability of the basic unit reduces input because the fixed costs are distributed over more working hours or mileage.

The operating costs diagrams contain figures for agriculture, forestry, as well as for trade and industry. They are based for agriculture on Unimog with rear power lift, for forestry with trailer-brake assembly, and for the trade and industry with all-steel driver's cab and trailer-brake assembly.

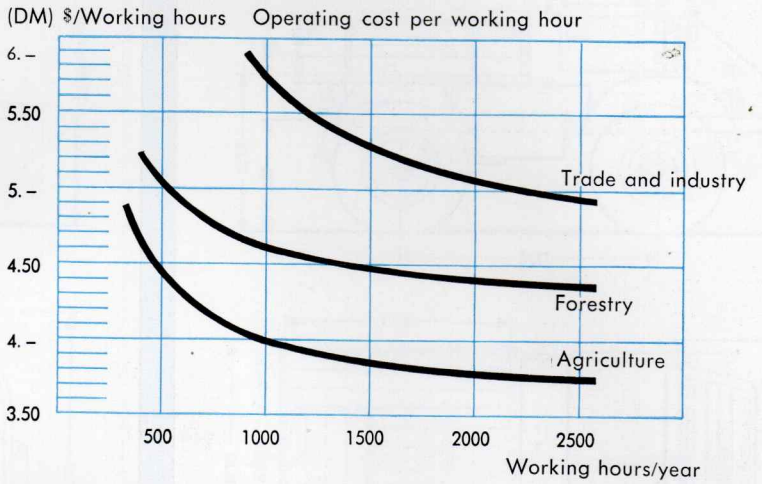
The following kinds of cost have been accounted for:

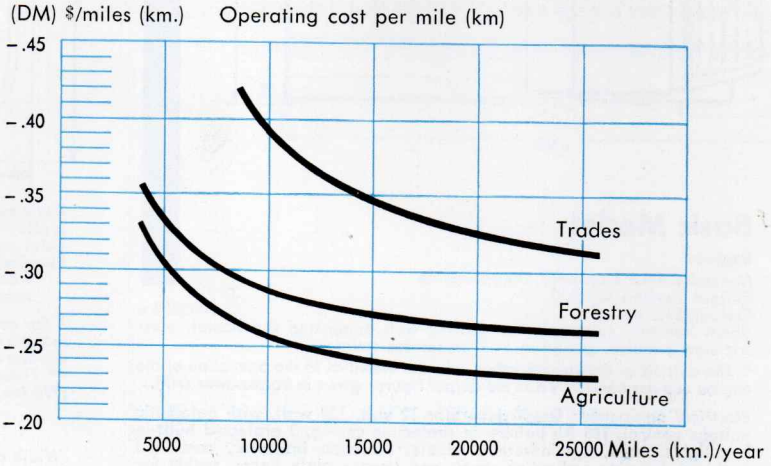
in agriculture: interest, liability insurance, storage, amortization, repair reserve fund, Diesel fuel (at reduced price), lubricants, and maintenance;

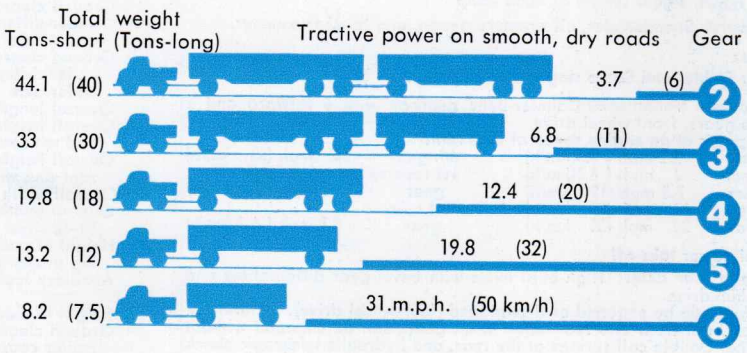
in forestry: interest, liability insurance, storage, amortization, repair reserve fund, Diesel fuel, lubricants, and maintenance;

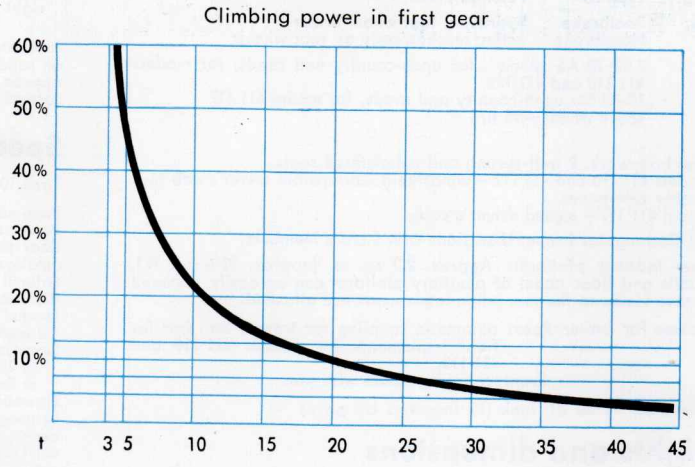
in trade and industry: interest, liability insurance, vehicle and equipment insurance, vehicle tax, storage, overhead expenses, amortization, repair reserve fund, Diesel fuel, lubricants, and maintenance.

Values stated in graphs are approximate. Obviously special factors will have to be taken into consideration with any particular enterprise; however, basic knowledge of vehicle cost and structure can be useful for accurate operating planning. Detailed data on operating cost can be supplied upon request.

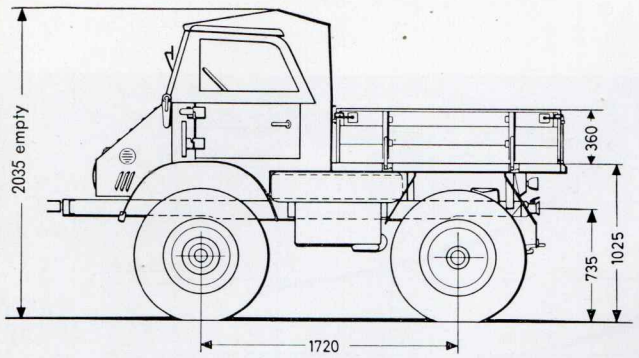


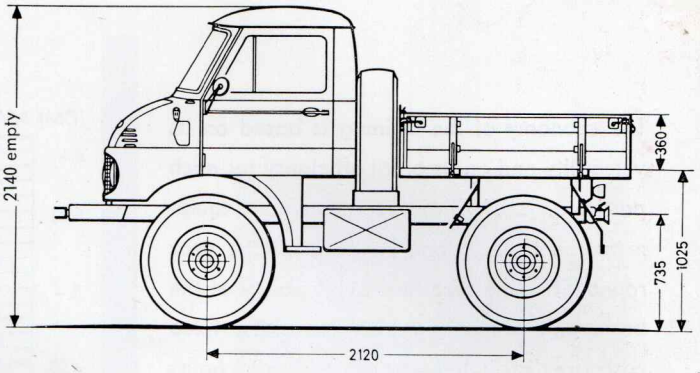


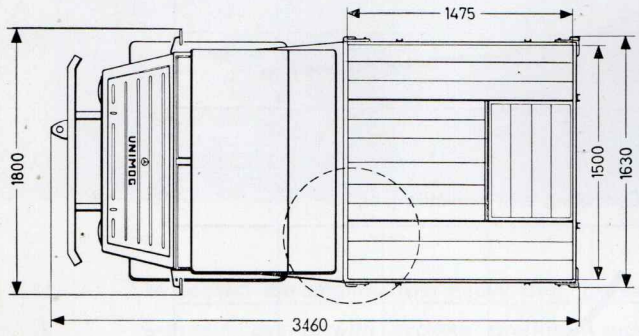


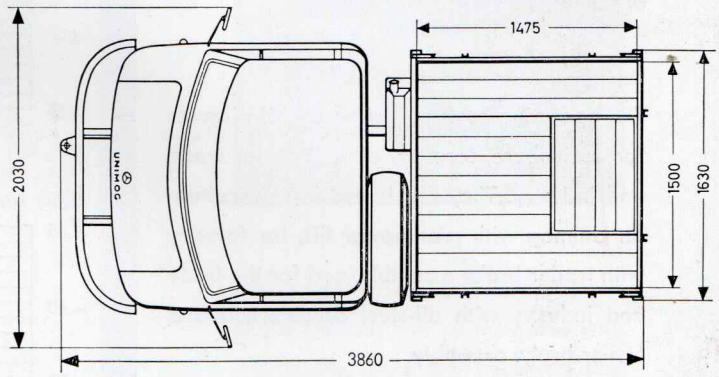


TECHNICAL DATA









Basic Model

Engine:

Mercedes-Benz 4 cylinder, diesel engine
Output (nominal output) 32 PS
Output (SAE norm)* 35 HP/2550 n
Bosch injection system, water cooling with pump and thermostat, electric starter motor, governor, built-in service counter.

** The outputs of the various other units not essential to the operation of the engine are not considered in the output figures given in horsepower (HP).*

Electrical equipment: Bosch generator 12 volt, 130 watt, with automatic voltage control, 105 Ah battery in protective casing, 2 protected built-in headlights, horn, 2 windscreen wipers, direction indicator, combined braking, direction indication, rear, and licence plate lights, socket for trailer lights, signal system or hand lamp

Dashboard: Speedometer, oil pressure gauge, and telethermometer.

Chassis:

Clutch: Fichtel and Sachs single plate dry clutch K 16 Z

Synchronised transmission: Daimler-Benz gearbox with 6 forward and 2 reverse gears, front wheel drive
Max. speeds at an engine speed of 2550 rpm:

1st gear	2.2 mph (3.5 km/h)	6th gear	33 mph (53 km/h)
2nd gear	4 mph (6.5 km/h)	1st reverse gear	1.5 mph (2.5 km/h)
3rd gear	7.5 mph (12 km/h)		
4th gear	13 mph (21 km/h)	2nd reverse gear	3.1 mph (5.0 km/h)
5th gear	22 mph (35 km/h)		

Central power take-off

Front and rear axles: High-built axles with bevel-gear differentials and wheel hub drive.
Front axle can be engaged or disengaged (four-wheel drive). Differential locks on both front and rear axles in all gears can be engaged without clutching. Double coil springs at the rear, and hydraulic telescopic shock absorbers at front and rear.

Steering: Type 30 Fulmina make

Brakes: Footbrake hydraulic, four wheel brake
Handbrake acting mechanically on rear wheels

Tires: 7.50–18 AS special, for open-country and roads, for models 411 110 and 411 112.
10–18 for open-country and roads, for model 411 117
spare wheel with tire

Body:
All-steel bodywork, 2 well-sprung and upholstered seats.
For models 411 110 and 411 112 – windshield, collapsible driver's cab top, detachable side-panes.
For model 411 117 – closed driver's cab.

Frame: Rectangular frame, U-sections with 5 cross members

Auxiliary loading platform: Approx. 2.2 sq. m. (approx. 23½ sq. ft.), side walls and floor panel of auxiliary platform can be easily removed to improve vision to the rear when implements are attached.

Mechanism for trailer: Rear: automatic coupling for trailer, tool bar for field implements for models 411 110 and 411 112.
Front: coupling mouth with pin.

Fuel container: 1 60 lit. tank (13 Imp./15.5 US gals.)

Weights and dimensions

For model no.	411 110 in kg (lbs.)	411 112 in kg (lbs.)	411 117 in kg (lbs.)
Empty weight (acc. to DIN 70020, without driver)*	1795 (3,959)	1895 (4,178)	1940 (4,277)
Empty weight (as certified by the Federal office for motor vehicles)**	2200 (4,850)	2300 (5,071)	2300 (5,071)
Payload on loading platform	1000 (2,205)	1200 (2,646)	1200 (2,646)
Total permissible weight	3200 (7,055)	3500 (7,716)	3500 (7,716)
Permissible axle load:			
front	1900 (4,189)	1900 (4,189)	1900 (4,189)
rear	2000 (4,409)	2000 (4,409)	2000 (4,409)

** For cultivation of the soil the weight of the tractor can be lessened on models 411 110 and 411 112 by about 135 kg (298 lbs.) by taking off the windscreen, the collapsible roof of the cab, etc.*
*** These figures include 250 kg (551 lbs.) for model 411 110 and 350 kg (772 lbs.) for model 411 112/117 for attached or mounted implements.*

	411 110 mm (ins.)	411 112 (mm ins.)	411 117 mm (ins.)
Width of track, front and rear	1293 (50¾'')	1293 (50¾'')	1359 (53½'')
Ground clearance under differential	1541 (60$^{43}/_{64}$'')	1541 (60$^{43}/_{64}$'')	—
under axle	1720 (67$^{23}/_{32}$'')	2120 (83¾'')	2120 (83¾'')
Ground ctearance under differential	380 (14$^{61}/_{64}$'')	380 (14$^{61}/_{64}$'')	380 (14$^{61}/_{64}$'')
under axle	460 (18 $^{7}/_{64}$'')	460 (18 $^{7}/_{64}$'')	460 (18 $^{7}/_{64}$'')
Overall length	3460 (136'')	3860 (152$^{1}/_{32}$'')	3860 (152$^{1}/_{32}$'')
Overall height inc. roof and windscreen	2035 (80$^{1}/_{8}$'')	2035 (80$^{1}/_{8}$'')	2140 (80$^{21}/_{64}$'')
Overall height excluding roof and windscreen	1625 (64'')	1625 (64'')	—
Overall width	1630 (64¼'')	1630 (64¼'')	1835 (72¼'')
Overall width with 10–18 tires	1680 (66 $^{5}/_{32}$'')	1680 (66$^{5}/_{32}$'')	1835 (72¼'')
Height of auxiliary loading platform off ground	1065 (41$^{59}/_{64}$'')	1065 (41$^{59}/_{64}$'')	1065 (41$^{59}/_{64}$'')
Auxiliary loading platform	1475x1500 (57$^{5}/_{8}$''x59$^{1}/_{16}$'')	1875x1500 (73''x59$^{1}/_{16}$'')	1475x1500 (57$^{5}/_{8}$''x59$^{1}/_{16}$'')
Height of sides	360 (14$^{11}/_{64}$'')	360 (14$^{11}/_{64}$'')	360 (14$^{11}/_{64}$'')
Ground clearance of trailer coupling	735 (28$^{15}/_{16}$'')	735 (28$^{15}/_{16}$'')	735 (28$^{15}/_{16}$'')
Smallest diameter of turning circle, to left and right (DIN 70020)	7.6 m (25 ft.)	9.1 m (30 ft.)	9.1 m (30 ft.)

Fuel consumption: approx. 30 miles per Imp. gal./25 miles per US gal. on roads without trailer.
approx. 0.4–1.3 Imp./0.5–1.5 US gals. per hour in fields, acc. to work carried out.

Special equipment (at extra cost)

Tires 10–18

Pneumatic system for power lift and trailer brakes
Power take-off shafts front and rear
Rear power take-off shaft with intermediate power take-off beneath the auxiliary loading platform
Lateral power take-off with pulley (for models 411 110 and 411 112 only)
Additional 2-speed crawling gear.
Lowest speed at smallest engine speed in 1st crawling gear – approx. 0.2 mph
Crawling gear speed at an engine speed of 2550 rpm –
in 1st crawling gear approx. 0.7 mph
in 2nd crawling gear approx. 1.2 mph
Tippable loading platform, folding side, platform cover, tachograph, heating and ventilation system for model 411 117, extended air-intake necks, clearance lights for operation with trailer (for models 411 110 and 411 112)

Additional implements:

Cable winch at front, with and without braking mechanism
Cable winch at rear with cable guide or spooling device and wheel blocks.
Recoil brake for rear cable winch, compressed air attachment 2200 lit.

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