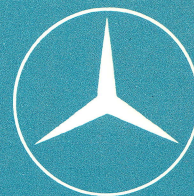


**Service Manual  
Engines M 116·117**



service

**Daimler-Benz Aktiengesellschaft**



# **Service Manual Engines M 116-117**



**service**

**Daimler-Benz Aktiengesellschaft**  
Stuttgart-Untertürkheim  
Zentralkundendienst

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This Service Manual contains a description of all important assembly, adjustment and inspection jobs. Pertinent data, dimensions, and tolerances, as well as special tools for various individual operations are listed in separate tables.

The entire contents of this Service Manual are arranged by Group. The Group Index serves to locate any particular group. Each Group is preceded by a comprehensive listing of its contents.

The instructions given in this book are based on the use of the respective equipment and special tools, and the assumption that the person performing the job is acquainted with basic mechanical principles. We recommend that only an authorized Mercedes-Benz Dealer perform work which is highly technical or requires special equipment or special tools.

Satisfactory results may be obtained by methods other than those described here, but following these instructions will always bring best results in the shortest possible time.

Daimler-Benz Aktiengesellschaft  
Zentralkundendienst

July 1972



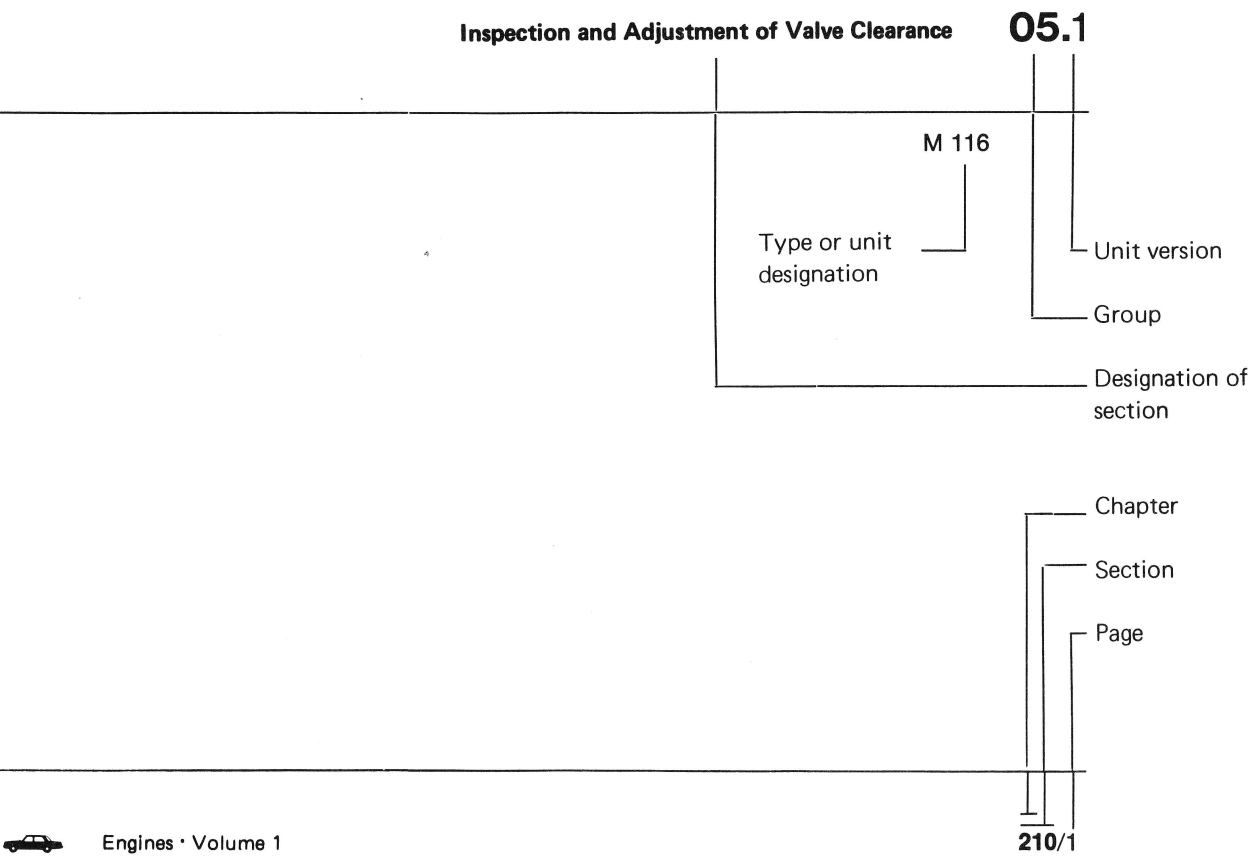
**Instructions for Use of Service Manuals****A****General Repair Instructions and Technical Data****B****Information Applicable to  
Engines in General****Engine 0**

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**Information Applicable Specifically to  
Engines M 116 · 117****Engine 1**

Engine jobs comprising several design groups	<b>00.1</b>
Cylinder crankcase with power unit	<b>03.1</b>
Cylinder head and engine timing	<b>05.1</b>
Electronically controlled gasoline injection system with pressure regulation	<b>07.4.1</b>
Ignition system	<b>07.5.1</b>
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# A Instructions for Use of Service Manuals



## To use this Manual:

Check Group Index to locate job. Group number is listed in upper corner of each page in the group.

Check group contents listing to find chapter and section of exact job description required. Chapter and/or section numbers, succeeded by page numbers within this section, are listed in lower outer corner of page. Section designation is printed next to group on top of page.

Unit Version **0** in the various Groups is **general** information applicable to the pertinent unit.

Unit Version with a **different numeral** is **specific** information for the title vehicle.



<b>Technical Data</b>	Model 107	Job No.
		010
<b>General Repair Instructions</b>		
Jacking-up the Vehicle		210
Towing the Vehicle		220



**Type Designation**

Vehicle model	107.043	107.044 (USA)
Engine type	M 116	M 117
Engine type designation	116.982	117.982

**Design Characteristics**

Manual 4-speed transmission	standard	—
Automatic transmission	optional	standard
Floor shift	standard	
Differential lock with limited slip	optional	
Dual circuit brake system with vacuum booster Disc brakes front and rear	standard	
Power steering	standard	

**Engine**

Operation	four-cycle gasoline injection, electronically controlled	
Number of cylinders	8	
Arrangement of cylinders	90° V	
Bore/stroke	mm	92/65.8      92/85
Total effective piston displacement	cc	3,499      4,520
Compression ratio		9.5:1      8:1
Firing or injection order	1—5—4—8—6—3—7—2	
Max. speed	rpm	6,300      5,800
Engine performance	in metric HP acc. to DIN <sup>1)</sup> at rpm in gr. HP acc. to SAE at rpm	200/5,800 230/6,050      195/4,500 230/5,000
Max. torque	in kpm acc. to DIN at rpm in kpm acc. to SAE at rpm	29.2/4,000 32.0/4,200      35.8/3,000 38.5/3,200

1) The horsepower specified in metric HP is fully available at the clutch, since all other power requirements have already been deducted.





Vehicle model	107.403	107.044 (USA)
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**Engine** (ctd.)

Crankshaft bearings	5 multi-component friction bearings with steel-backed shells
Connecting rod bearings	multi-component friction bearings with steel-backed shells
Valve arrangement	overhead
Camshaft arrangement	1 overhead camshaft for each bank of cylinders
Oil cooling	air oil cooler
Cooling	water circulation pump, thermostat with bypass line, fan with viscofan coupling, finned tube radiator
Lubrication	forced oil circulation by gear pump
Oil filter	main flow filter
Air cleaner	damping filter with paper element

**Dimensions**

Vehicle length	mm	4,370	
Vehicle width	mm	1,790	
Vehicle height, ready for driving	mm	1,300 with roadster top 1,290 with coupe top	
Wheel base	mm	2,460	
Track width	front	mm	1,452
	rear	mm	1,440
Wheel lock	inside		40°
	outside		34°
Turning circle min. dia.	m	10.34	
Ground clearance, vehicle in basic design position <sup>1)</sup>			136

1) The basic design position is attained when the vehicle ready for driving is loaded with 65 kg each on front seats and 1 x 65 kg on rear seat (in center).

Vehicle model			107.043	107.044 (USA)	
Weights					
Vehicle dead weight acc. to DIN 70 020 ready for driving, with fuel tank full, spare wheel and tools			kg	1,545	1,682
Perm. total weight			kg	1,975	2,105
Perm. axle load front/rear			kg	980/995	1,015/1,090
Electrical System					
Battery	Voltage	V	12		
	Capacity	Ah	66		
Filling Capacities					
Fuel tank/reserve Fuel			approx. lits.	90/13	
Cooling system with heating Water			approx. lits.	14.3	15.0
Crankcase (without oil filter and air oil cooler) max./min. Engine oil			lits.	7.5/5.5	
Oil filter	Engine oil	approx. lits.	0.75		
Air oil cooler	Engine oil	approx. lits.	0.4		
Water pump			service-free		
Hydr. clutch actuation Brake fluid			approx. lits.	0.1 <sup>1)</sup>	—
4-Speed manual transmission G 76/27 A	Transmission fluid (ATF) lits.		1.8	—	
Automatic transmission K 4 A 040			6.8 <sup>2)</sup>	—	
Automatic transmission W 3 A 040			—	8.9 <sup>4)</sup>	
Rear axle Hypoid transmission fluid SAE 90			lits.	1.4 <sup>3)</sup>	
Power steering Transmission fluid (ATF)			lits.	1.4	
Front wheel hub Anti-friction bearing grease (each hub)			65—80		
Brake system Brake fluid			approx. lits.	0.5	

1) The brake fluid for the brake system and for actuating the clutch is in a common compensating tank.

2) Applies to initial filling only; refills during oil change approx. 5.8 liters.

3) Fill rear axles with locking differential with special oil only — refer to Operating Instructions.

4) Applies to initial filling only; refills during oil change approx. 7.9 liters.





Vehicle model	107.043	107.044 (USA)
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## Speeds, Consumption Figures and Operating Conditions

At rear axle ratio $i =$	3.46	3.07
Maximum speeds in individual gears timed	4-Speed manual transmission	Automatic transmission
1st gear km/h	54	43
2nd gear km/h	90	90
3rd gear km/h	150	150
4th gear approx. km/h	210	205
Climbing ability 1st gear slip limit %	43	43
2nd gear %	41	43
3rd gear %	22	32
4th gear %	13.5	—
Acceleration, engaging the individual gears 0–100 km/h carrying 2 persons sec. $\pm 7\%$ <sup>1)</sup>	8.8	9.0
Engine speed at 100 km/h in direct gear rpm	2,945	2,945 to 3,085
Fuel consumption for average highway travel lits./100 km <sup>2)</sup>	11.5–18.5	14–22
Fuel consumption acc. to DIN 70 030 <sup>3)</sup> lits./ 100 km	13.0 at 110 km/h	15 at 110 km/h
Engine oil consumption lits./ 100 km	0.15–0.25	
Cooling water Working temperature	70°C–95°C	
Max. temperature	115°C	
Fuel	Premium or gasoline-benzol mixture	
Antiknock rating (min. RON) for maximum output <sup>4)</sup>	96	
with maximum retardation of ignition involving a loss of performance	90	

- 1) The range " $\pm 7\%$ " comprises not only variations in permissible engine output, but also possible permissible variations due to tire condition. Cars with automatic MB transmission should be accelerated with kickdown in position 4.
- 2) The fuel consumption of vehicles with automatic MB transmission is approx. 5–10 % higher.
- 3) Determined at 3/4 of the max. speed, at a maximum of 110 km/h with a 10 % increase.
- 4) Gasoline engines are tuned at the factory to maximum performance using conventional fuels. If, as an exception and for a limited period, fuels with an anti-knock rating below the max. of the specified octane number must be used, the ignition should be retarded accordingly.

## Notes

**Jack-up vehicle carefully to eliminate accidents and damaging the vehicle. Prior to applying the vehicle jack, be sure to secure the vehicle against moving off by placing chocks or the like against the wheels.**

The chocks supplied as special equipment are inside the trunk near the spare wheel.

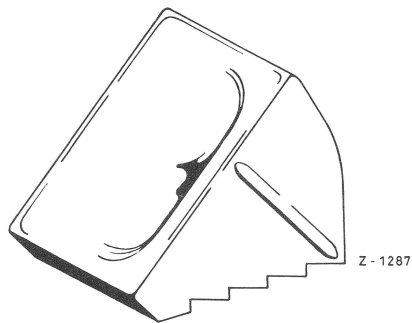


Fig. 1

## Jacking-up with Vehicle Jack

Position chocks as follows:

On level ground place one chock in front of and one chock behind a wheel on opposite vehicle side.

On a gradient, place one chock against the front wheel and another against the rear wheel on opposite vehicle sides.

On vehicles with manual transmission, shift to 1st gear. On vehicles with automatic transmission, place selector lever in position "P".

Energetically depress pedal parking brake.

Position vehicle jack vertically, also on gradients.

## Jacking-up with Pit Lift or Vehicle Jack

In the workshop, the vehicle is raised best with the pit lift applied against the front or rear axle (Fig. 2 and 3).

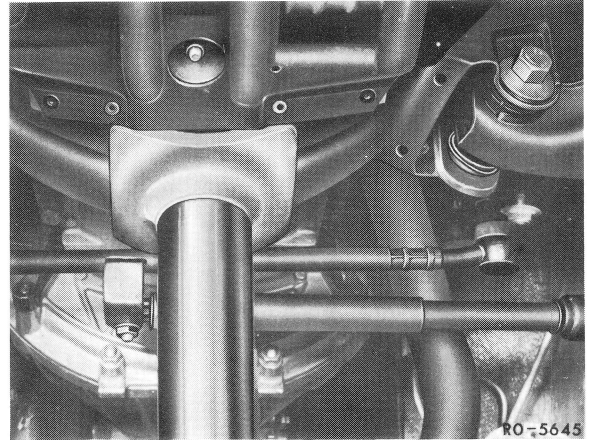


Fig. 2

Raising vehicle on front axle

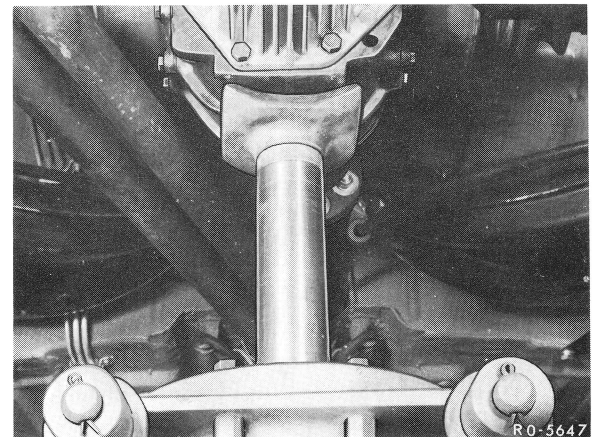


Fig. 3

Raising vehicle on rear axle

When raising a vehicle laterally with a garage jack, use the pertinent spots provided on frame for crosshead lifting platforms.

## Jacking-up with Crosshead Lifting Platform or Short Stroke Lifting Platform

Position holding blocks on front axle at inner frame side members (1), at rear axle on supporting plates of front bearing of rear axle carrier (2) (Fig. 4).



## B Jacking-up the Vehicle

**Caution!** Do not apply load against center of supporting plate between frame floor and rear axle carrier.

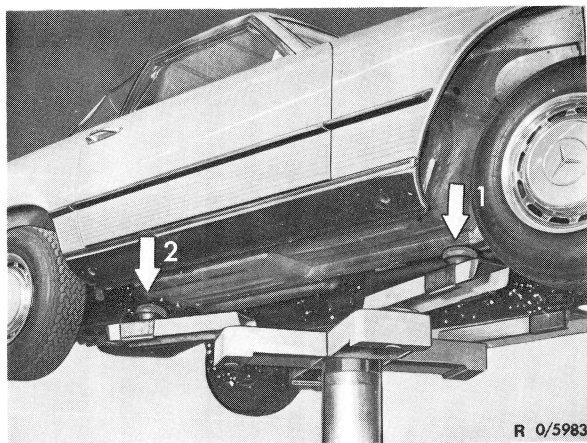


Fig. 4

- 1 Inner frame side member
- 2 Rear axle carrier

### Positioning of Supporting Stands

Similar to jacking-up with the short stroke lifting platform, supporting shoes are placed on the supporting stand and plugged into the frame floor (Fig. 5 and 6).

These supporting shoes will prevent any denting of the outer frame floor side members. Supporting shoes provide the additional advantage that no bending stresses are exerted against the plug-in tubes themselves, so that here too any loads on the body even for extended periods are unobjectionable.

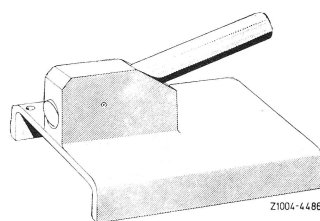


Fig. 5

Supporting shoe 107 589 03 63 00

**Caution!** Supporting shoes are provided with a chain painted brightly red. Any supporting shoe remaining on the vehicle by mistake will be easily spotted. As an additional protection against a supporting shoe remaining on the vehicle it will be of advantage to attach a steel ring (a used roller bearing race, for example) of approx. 60 mm dia. to the chain (Fig. 6), so that the resulting noise will alert the driver immediately.

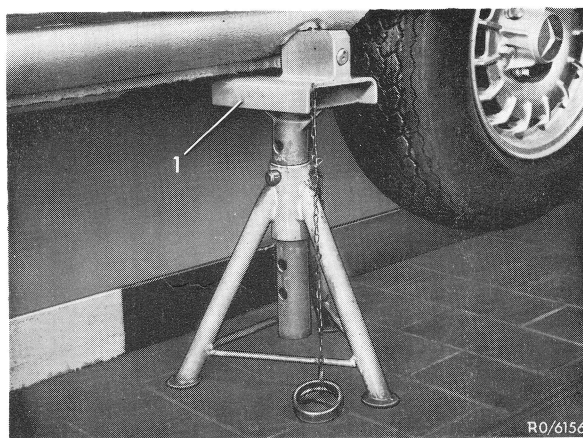


Fig. 6

1 Supporting shoe 107 589 03 63 00

## Notes

The vehicle can be towed or tow-started by means of the eye (1) at front of frame side member (Fig. 1).

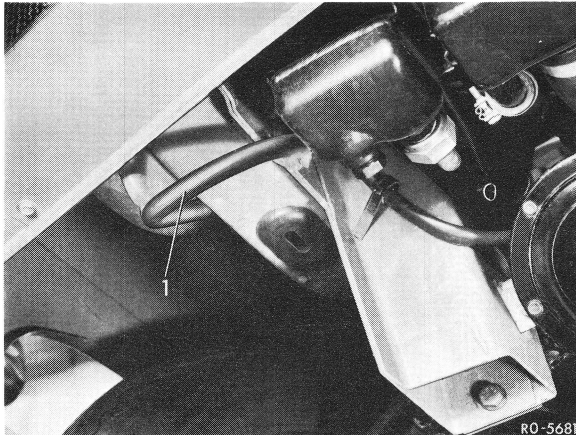


Fig. 1

1 Towing eye

The rear of the vehicle is also provided with an eye (1) for attaching a towing rope (Fig. 2).

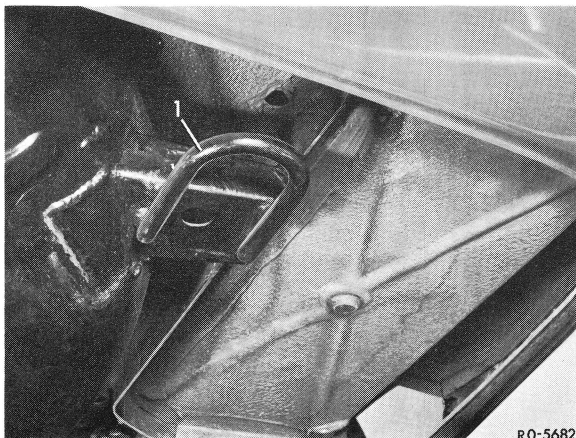


Fig. 2

1 Towing eye

**Caution!** Obviously, this eye is provided for emergencies and for towing for short distances only. Use a flexible fabric rope only, never a steel wire rope.

## Towing of Vehicles with Automatic Transmission

Tow vehicle only in selector lever position "N". **The towing speed should never exceed 50 km/h!**

**Caution!** On vehicles with damaged front section by an accident the propeller shaft must be disconnected, to avoid the risk that cooling water will enter the transmission fluid or that the transmission is no longer lubricated as a result of the interrupted oil circuit and will be ruined.

## Towing of Vehicles with Towing Trailer and Front Axle Removed

For transporting vehicles with removed front axle to or from a body repair shop do not place the front frame side members directly on towing trailer to avoid bending. For such transportation jobs, an old, disassembled front axle carrier should be temporarily used.

## Tow-starting Vehicles with Automatic Transmission

Tow-start vehicle with selector lever in position "N"; move selector lever to position "2" at a speed of approx. 50 km/h.

**Caution!** Accelerate only when the engine starts turning, since the transmission is connected to the power train only in idling speed position of the accelerator pedal.