Operating Instructions
Notes concerning vehicle safety

We recommend that
- only MERCEDES-BENZ original parts and conversion parts and accessories expressly approved for the respective vehicle model by MERCEDES-BENZ should be used.
  Safety, reliability and suitability of these parts have been determined in a special test;
- bodies should be made and mounted in compliance with current MERCEDES-BENZ Body/Equipment Mounting Directives. Only in this way is it ensured that chassis and body form a unit and that optimum operational reliability and roadworthiness is offered.

We cannot be held liable for reliability, safety and suitability if
- original parts or approved conversion parts and accessories have been replaced with other parts or if other modifications have been made to the vehicle;
- bodies have not been manufactured or mounted in compliance with current MERCEDES-BENZ Body Equipment Mounting Directives, or if in the case of deviations from these directives the approval of MERCEDES-BENZ has not been obtained.

Approval granted by public testing agencies or official authorizations do not rule out safety hazards.

Every MERCEDES-BENZ service station will offer further information.

Printed in Germany

We reserve the right to modify the technical details as given in the data and illustrations of these Operating Instructions (s.e.e.o.).
Reprinting, translation and copying, even of excerpts, is not permitted without our prior authorization in writing:

VKT 8.89.10 RU
These Operating Instructions are designed to provide clear answers to essential questions concerning operation, service and maintenance. In some sections you will in addition find instructions for the economic operation of your vehicle. By complying with these instructions you can assist in effectively reducing the fuel consumption (energy consumption).

Operating Instructions and Maintenance Booklet are important documents which should always be carried in the vehicle.

To ensure continuous operational reliability and roadworthiness, we strongly recommend that service and maintenance work listed in the Maintenance Booklet be carried out on time.

For this purpose, an extensive network of MERCEDES-BENZ service stations is at your disposal.

Before operating the vehicle for the first time, please refer to the sections entitled „Components“ and „Operation“.

Several vehicle types whose principal components are identical are dealt with in these Operating Instructions. Besides this important optional extras are included. Your vehicle may therefore differ from some of the descriptions and illustrations.

We wish you good motoring!

Mercedes-Benz Aktiengesellschaft
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1 Data cards/identification plates

With the vehicle you are handed over data cards listing all the important vehicle data (e.g. vehicle identification number and component numbers including model and designations of the special equipment, etc.). These data are required when ordering spare parts or inquiring for technical details.

Card no. 1
For safety reasons this card must not be kept in the vehicle. It lists the key numbers for the ordering of replacement keys.

Card no. 2
This card (without key numbers) is kept in the Maintenance Booklet.
2 Components

2.1 Door control, front (example)

Hinged door

Door control, outside
1 Locked
2 Unlocked
To open the door, press in door lock cylinder

Door and window control, inside
1 Door latch unlocked
2 Door latch locked
3 Opening lever, door
4 Window crank
5 Vent window lock (push button to unlock)
Sliding door

Door control, outside
1 Locked
2 Unlocked
3 Opening lever
   Press opening lever, grip handle and push door fore (aft) until the lock engages.

Door control, inside
1 Opening lever
   Actuate opening lever, grab lever and push door fore (aft) until the lock engages.
2.2 Driver’s seat adjustment

Standard version
1. Height of seat, front portion
2. Forward and rearward
3. Height of seat, rear portion
4. Seat back

Make Isringhausen
1. Forward and backward adjustment
2. Height of seat, front portion
3. Height of seat, rear portion
4. Seat back position
5. Seat load
2.3 Seat belts (example)

These instructions are only applicable to belts which were installed at the manufacturing plant of the vehicle. For subsequent installation use only seat belts approved by us.

Notes:
- Use each safety belt for only one person.
- Three-point belts are not intended for children up to a size of approx. 140 cm.
- Seat belts which are subjected to severe strain during an accident must be renewed. Inspect belt anchorages.
- Renew damaged seat belts.
- Changes which impair the effectiveness of the belt may not be carried out.
- Belt webs may not be directed over sharp edges.
- For cleaning and care of belt webbing, refer to section 5.13.

Seat belts with inertial reels

Three-point seat belt

Fastening:
- Pull belt with tongue (1) over shoulder and lap. The belt must not be twisted.
- Press tongue (1) into buckle (2) and allow to engage audibly.
- The belt must be tight. Check this condition immediately after having fastened it and regularly while driving. If necessary, tension lap belt by pulling the upper belt section upwards.

Unfastening:
- Push red button (3) in buckle.
- Return tongue (1) to initial position.
Lap belt
- Pull belt by tongue (1) over the lap, press tongue into buckle (2) and allow to engage audibly. The belt must not be twisted but must fit snugly.
- To unfasten the belt, push button (3) in buckle.

Inertia reel operation
The inertia reel of the seat belts stops the belts unwinding further in case of vehicle deceleration in any direction and if the belts is pulled out quickly.
The locking function of the inertia reel can be checked by braking, by cornering or by pulling the belt out quickly.

Seat belts without automatic retraction unit

Lap belt
- Pull belt with buckle latch (1) over the lap, engage in the buckle (2) and engage audibly. The belt may not be twisted and must hug the body.
Shortening the belt: Engage buckle latch in the buckle.
PULL the belt end until taut.
Extending the belt: Press the buckle latch into the buckle latch housing and adjust the belt web to the desired length.
- For loosening the belt press the red button (3) in the buckle.
### 2.4 Instruments and controls

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**Indicator lights**

- High beam
- Interior light – bus
- Differential lock, rear axle (page 42)
- Choke control (page 37)
- Preglowing (page 36)
- Turn signal indicator light – tractor
- Turn signal indicator light – trailer
- Rotary flashing beacon
- Step

**Switches**

- Blower (page 20)
- Heated rear window
- Rotary flashing beacon
- Seat heater (page 19)

**ABS (page 48)**

- Dump body
- Shift lock power take-off, (page 43)
- Charge indicator light (page 46)
- Brake fluid and brake pad wear (page 46)
- Oil pressure – engine
- Heated rear window
- Supplementary heater – operation indicator light (page 22)
2.5 Tachograph (example)

1. Time group knob
2. Speedometer
3. Speed warning light
4. Clock function control light
5. Function control light

2.6 Battery master switch

Battery master switch on seat base
1. Switched on
   All consuming units can be switched on.
2. Switched off
   All consuming units are disconnected from the battery.
   The actuation lever can be pulled off.
2.7 Steering lock/starter switch

Steering lock
0 In this position the key can be inserted or removed. When the key is withdrawn, the steering is locked.
1 Steering unlocked
2 Driving position
3 Starting position

Caution! Never lock the steering if the vehicle is rolling.

Starter switch
0 In this position the key can be inserted or removed.
2 Driving position
3 Starting position

2.8 Light switch

0 Off position
1 Parking lights
2 Headlights
(Vehicles with automatic headlight switch-off system: Only while the engine is running and the charge indicator light has gone out).
3 Standing lights, right
4 Standing lights, left
A Fog lights on in position 1 or 2
B Fog lights plus rear fog light with indicator light on in position 1 or 2
2.9 Combination switch

1. Low beam
2. High beam
3. Headlight flasher
4. Turn signal lights, right
   Up to point of resistance = brief flashing.
   Beyond point of resistance (engagement) = continuous flashing.
5. Turn signal lights, left
   Up to point of resistance = brief flashing.
   Beyond point of resistance (engagement) = continuous flashing.

6. Windshield wiper
   "O" Switched off
   "I" Intermittent wiping
   "II" Low speed
   "III" High speed

7. Windshield washer system - headlight cleaning system
   Press switch = switched on. The headlight cleaning system (optional) is only
   operated when the vehicle lights are switched on.
   Check wiper blades regularly for soiling and damage.
2.10 Headlight beam control

0 Normal position
I Vehicle with maximum load (with evenly spread load)
II Vehicle with maximum load (with large part of load shifted to rear axle)

2.11 Interior light

Switch positions
1 On
2 Off
3 Light is switched on and off by the door contact.
2.12 Interior mirror

Operating lever
1 Normal position
2 Dimmed position

2.13 Seat lock – assistant driver’s seat

1 Unlocking, right
2 Unlocking, left

Operate lever, tilt seat forward or backward until lock engages.
2.14 Headrest (example)

Height and inclination of headrest can be adjusted.

2.15 Seat heater

Control switch
Press upper end (II) = fast heating
Center position = switched off
Press lower end (I) = continuous operation
If the engine is off, do not engage position „fast heating“ for longer than is absolutely necessary.
2.16 Heating and ventilation

Control levers are infinitely variable

1 Blower switch
   Press upper end (II) = speed 2
   Center position = off
   Press lower end (I) = speed 1

2 Air flaps for windshield (ventilation or defrosting)
   Lever positions: left = closed
                   right = open

3 Water control valve
   Lever positions: left = cold
                   right = warm

4 Air flaps for footwell (ventilation or heating)
   Lever positions: left = closed
                   right = open

5 Ventilation and defrosting nozzles

6 Ventilation and heating nozzles

7 Ventilation and defrosting nozzles, adjustable.
   The nozzles can be opened and closed with the lever in the nozzles.
Window defrosting:

Heater fully on:

Ventilation fully on:
2.17 Supplementary heater (optional extra)

The supplementary heater can be operated with the vehicle engine shut off or running.
Switch on supplementary heater for approx. 5 minutes at least once a month.

Hot-air supplementary heater

Switching on:
- Switch on battery master switch (optional extra).
- Press supplementary heater switch at lower end. The operation indicator light on the instrument panel comes on. After approx. 2 minutes the heater will start.

Switching off:
- Press supplementary heater switch at upper end. The operation indicator light goes out. The heater is cut out automatically after a 2 minute lag.

Hot-water supplementary heater

Switching on:
- Switch on battery master switch (optional extra).
- Push heater control valve lever all the way to the right.
- Press supplementary heater switch at lower end. The operation indicator light on the instrument panel comes on. After approx. 1 minute the heater will start.

Switching off:
- Press supplementary heater switch at upper end. The operation indicator light goes out. The heater is cut out automatically after a 21/2 minute lag.
Timer (hot-water supplementary heater, optional extra)

1 Programmed heating

Switching on:
Example: The supplementary heater is to start at 10:00 hours the next morning, the time switch should be set at 18:00 hours on the previous evening.
- Set rotating dial to have graduation 18 coincide with the right edge of the colored field.
- Turn setting knob with its pointed end clockwise beyond graduation 10. Then reverse it to 10.
- The heater switches itself on automatically at the preselected time. The operation indicator light on the instrument panel comes on.

Switching off:
- Turn setting handle counterclockwise to the end of the colored field. When doing this, some resistance must be overcome.
  Caution: Do not apply force when turning the setting knob. The operation indicator light goes out. The heater is automatically switched off after an approximate 21/2 minute lag.
- After a maximum of 1 hour the supplementary heater switches off automatically.

2 Immediate heating

Switching on:
- Turn setting knob clockwise beyond the colored field and then reverse to the right edge of the colored field. The operation indicator light on the instrument panel comes on. After approx. 1 minute the heater will start.

Switching off:
- Turn setting handle counterclockwise to the end of the colored field. When doing this, some resistance must be overcome.
  Caution: Do not apply force when turning the setting knob. The operation indicator light goes out.
  The heater is automatically switched off approximately after a 21/2 minute lag.
- After a maximum of 1 hour the supplementary heater switches off automatically.
2.18 Door control – cargo space

Rear door

Door control, outside (example)
1 Unlocked
   To open the door, press in door lock cylinder
2 Locked

Door control, inside
1 Door latch unlocked
2 Door latch locked
3 Opening lever of 1st door
4 Lock of 2nd door
   To open, swing handle up.

Van with high roof
Opening angle 90°
1 Locking hook
   Open door 90° and engage locking hook.
2 Clamp
   Fasten locking hook before closing the door.

Opening angle 180°
1 Locking hook
2 Door check
   Disengage locking hook, swing door check inward.
   Open door 180° and engage locking hook.
   Prior to closing the door, engage door check. Attach locking hook.
Opening angle 270°
1 Door lock
Disengage locking hook, swing door check inward.
Open door 270°. Engage lock.
To unlock, pull forward latch in the door lock.
Prior to closing the door, engage door check. Fasten locking hook.

Sliding door (example)

Door control, outside
1 Locked
2 Unlocked
To open the door, press in door lock cylinder, grab handle and push door rearward to the stop.
To close the door, grab handle and push door forward until the door lock engages.
Door control, inside
1 Door latch unlocked
2 Door latch locked
3 Opening lever, door

Childproof lock (rear door and sliding door)

Actuate safety catch
(e. g. with the steering lock key)
1 Unlocked
2 Locked
The door can be opened from outside only.
2.19 Engine cover

Opening the engine cover
1 Clamp
Note:
Prior to the detachment of the engine cover, remove driver's seat.
2.20 Engine compartment flap

Opening the engine compartment flap
1 Lever
2 Safety hook
   - Operate lever
     The engine compartment flap opens to the stop of the safety hook.
   - Actuate safety hook
   - Swing engine compartment flap up until the catch engages.

Closing the engine compartment flap
3 Safety catch
   - Lift engine compartment flap
   - Unlock catch
   - Swing down engine compartment flap and engage in lock.
3 Operation

3.1 Preparations for driving

Check the following items daily:
- Accessibility and completeness of the emergency equipment, e. g. first aid kit, hazard warning triangle, fire extinguisher

Prior to starting the engine
- Fuel reserve
- Vehicle lighting, turn signal and stop lights

After having started the engine
- Engine oil pressure
- Steering free play
- Tachograph for proper function

Fuel reserve
Insert key in steering lock and turn to driving position. Check fuel level on fuel gauge, replenish if necessary. Prior to filling the fuel tank, shut off engine and supplementary heater.
Do not fill fuel tank to the brim.
Fuel quality refer to sections 4.3 and 4.4.

Vehicle lighting, turn signal and stop lights
The lighting system including the stop lights must be checked daily for good condition and clean lenses. Bulbs, refer to section 5.11.9.
Steering free play

Manual steering
As soon as any play is felt at the steering wheel, have steering gear and steering linkage inspected at a MERCEDES-BENZ service station.

Power steering
Play in the steering should only be checked when the engine is running. The wheels must start moving when the steering wheel is turned approx. 30 mm. If they do not move, have steering gear and linkage inspected at a MERCEDES-BENZ service station.

Tachograph function control light

The control light comes on:
- if no chart is inserted,
- if the tachograph is defective,
- if the tachograph is opened.
Check at regular intervals:
(for example once a week or whenever you refuel)
- Oil level in engine
- Coolant level
- Hydraulic clutch control, hydraulic differential lock control and hydraulic brake system - fluid level
- Power steering - oil level
- Windshield washer system, headlight washer system - fluid level
- Soiling of air cleaner
- Batteries - fluid level
- Trailer coupling
- Inflation pressure and condition of tires
- Seat belts
- Engine, transmission, live axle, steering system, cooling and heating system for leaks

Oil level in engine
- Opening the engine compartment flap

Checking oil level:
- Engine at normal operating temperature
  The engine should have been at this temperature for some time.
- Vehicle standing on level ground.
- Wait at least 2 minutes after switching off engine.
  The oil must be between the bottom and top marks on the dipstick.
  Do not top up above max. mark.
Caution! Use only engine oils of the approved SAE classes.
Refer to section 4.1.
- Close engine compartment flap.
Coolant level

Only check the coolant level at a temperature of less than 50°C/122°F. Remove cap of coolant expansion tank. The expansion tank must be filled to the brim of the filler neck. If coolant must be replenished, - open water control valve of the heater. - top up to the brim of the filler neck.

For the composition of the coolant and the quality of the water, refer to section 4.2.
- replace cap of coolant expansion tank and tighten to the stop.
- run engine briefly at varying speeds.
- check coolant level and top up, if required.

Hydraulic clutch control, hydraulic differential lock control and hydraulic brake system - fluid level

The reservoir must always be filled sufficiently. Do not fill above upper marking (maximum marking). If brake fluid needs to be replenished, have the hydraulic system inspected.

Use only tested and recommended brake fluid brands for replenishment or renewal. Observe boiling point (DOT 4 plus). Refer to section 4.4. Replace brake fluid once a year, most suitably in spring.

Power steering - oil level

With the engine running the oil level must be between the upper and the lower dipstick marking.
Windshield washer system, headlight washer system - fluid level
Add MERCEDES-BENZ windshield washing detergent S for summer or W for winter to the water. Observe mixing ratio.

Soiling of air cleaner
In the case of heavy dust accumulation, check weekly; in extreme cases, check daily.

Vehicles with maintenance indicator 208 D - 410 D

Inspection
- If the entire red field in the maintenance indicator is visible, press push button to disengage the red field.
- Run the warmed-up engine at full throttle (accelerator fully depressed) and observe maintenance indicator. If the red field engages, renew filter element. Refer to section 5.1.4.
- Press push button to disengage the red field.

Batteries - fluid level
The batteries are located below the driver's and assistant driver's seats. The electrolyte level in each cell must be approx. 15 mm above the upper edge of the plates. Only replenish with distilled water. During the hot season, check battery electrolyte level more frequently.

Trailer coupling
Check trailer coupling for firm attachment. See section 5.12.1. When coupling the trailer, test function. See section 3.8.
Inflation pressure and condition of tires

Condition:
Check tires for even tread wear, depth of tread (to comply with legal requirements) and exterior damage. Remove foreign bodies from tread and between the tires (twin wheels).

If required, interchange front and rear wheels (e.g. if tread edges are feathered). The direction of rotation of the wheels should remain the same.
For wheel change, refer to section 5.9.3.

Inflation pressure:
Check inflation pressure (including spare wheel) on cold tires. The pressure differential of the tires on one axle must not exceed 0.1 bar (1.4 psi).
If the inflation pressure is too low on individual tires, check valves, wheels and tires for leaks.
Caution: Too low an inflation pressure reduces operational safety and tire service life.
High speed operation or hot weather may increase the inflation pressure as much as 1 bar (14 psi). Never bleed any air since the pressure will otherwise drop below specifications. For tires and inflation pressure, refer to „tire pressure chart“ (last page).

Seat belts
The inertia reel must stop the seat belt unwinding further if the vehicle
- is braked or accelerated
- is cornering
- or when the belt is pulled out quickly.
Inspect belts visually for damage.
Renew damaged seat belts.
3.2 Starting and shutting off the engine

Adhere to specific measures before starting an engine for the first time after it has been laid up for an extended period. Refer to section 5.15.

- Shift transmission to neutral (MB automatic transmission selector lever position "P" or "N").
- Switch on battery master switch (optional extra).
- Engage hand brake or service brake.

**208 D - 410 D**

Starting the engine:
- Insert key in steering lock and turn to driving position. The "charge", the "oil pressure" and the "preglow" indicator lights must come on. When the "preglowing" indicator light goes out, this is an indication that the engine can be started. When the engine is at operating temperature the "preglowing" indicator light comes on only briefly and the engine can be started immediately.
- Start engine with steering lock key.
  At low ambient temperatures (below 0°C/32°F), depress both accelerator and clutch pedal fully while starting the engine.
- Release steering lock key after the engine has started firing, ease off the accelerator.

Shutting off the engine:
- Take foot off accelerator
- Turn key to position "0".
  For shutting off the engine when the vacuum system is faulty, refer to section 6.8.

Notes
- Prior to repeating the starting process, turn key in steering lock back to the stop.
- The "charge" indicator light goes out as soon as idle speed has been exceeded once.
- Check oil pressure warning light immediately after starting. Should the oil
pressure warning light fail to go out, shut off engine immediately and determine cause.
- The engine should never be shut off at a coolant temperature above normal (pointer of temperature gauge almost at red marking), e.g. after operation in mountainous areas, but should be allowed to idle for about another 1 - 2 minutes.

210 - 410
Starting the engine:
Vehicles without catalyst
- Insert steering lock key and turn to driving position. The "charge" and "oil pressure" indicator lights must come on.
- Start engine with steering lock key.
Vehicles with manual transmission
To start the cold engine, pull out choke control all the way. With a coolant temperature of less than 60°C / 140°F, pull out choke control only halfway. The "choke control" indicator light comes on.
When starting a cold engine, fully depress the accelerator once and release. To start the hot engine, slowly depress accelerator while starting.
Vehicles with automatic transmission
When starting a cold engine, fully depress the accelerator once and release. To start the hot engine, slowly depress accelerator while starting.
- Release steering lock key after the engine has started firing, ease off the accelerator.
Vehicles with manual transmission
Push back choke control until the engine runs smoothly. On a hot engine push choke control fully in. The "choke control" indicator light goes out.
Vehicles equipped with catalyst
- Insert steering lock key and turn to driving position. The „charge“ and „oil pressure“ indicator lights must come on.
- Start engine with steering lock key.
- Release key after the engine has started firing.

Shutting off the engine:
- Take foot off accelerator
- Turn key to position „0“.

Notes
- Prior to repeating the starting process, turn key in steering lock back to the stop.
- Check oil pressure warning light immediately after starting. Should the oil pressure warning light fail to go out, shut off engine immediately and determine cause.
- The engine should never be shut off at a coolant temperature above normal (pointer of temperature gauge almost at red marking), e.g. after operation in mountainous areas, but should be allowed to idle for about another 1 – 2 minutes.

Caution!
Vehicles equipped with catalyst: In the case of erratic engine operation (e.g. misfiring), run engine just for a short while and accelerate sparingly. Have fault eliminated at a MERCEDES-BENZ service station.
3.3 Hand brake operation

To release:
- Pull lever slightly, depress button in hand brake lever and swing lever downward.

To engage:
- Pull lever firmly to the last possible catch.

3.4 Starting the vehicle and shifting gears

Do not set off immediately after the first few engine revolutions!

Caution! Immediately after setting off, test brakes (service and hand brakes) on a dry road affording good grip.

The brake is in good working order if the brake action of the wheels is equal and if sufficient deceleration is obtained. Your sound judgement will tell you whether the vehicle is prepared for the road.

There must be no oil or water on the brake linings. If water has penetrated to the brake shoes, apply service brake with light pedal force until the required brake action is restored.

If even only one brake fails to work, stop immediately.
Gearshifting

**Manual transmission**

Vehicles 210 - 410, 408 D, 410 D:
We recommend starting on level roads with 2nd gear. The 1st gear is only necessary for starting on uphill gradients.

Vehicles 208 D - 310 D:
Start off in 1st gear.

Engage reverse gear only at engine idle speed and with vehicle at a standstill.

**MB automatic transmission**

The automatic transmission facilitates and simplifies the handling of the vehicle. Operating ranges are selected by means of the selector lever. Within the selected ranges, the gears are shifted automatically conditional upon driving speed and accelerator position.

Shift to the desired driving position only with the engine idling. Release brake only when driving off. If a driving range is selected the vehicle might start off (creeping) prematurely.

**Accelerator positions**

Partial throttle = immediate upshifting = moderate acceleration.

Full throttle = retarded upshifting = maximum acceleration.

Kickdown: Depress accelerator beyond full throttle pressure point = full throttle downshift = maximum acceleration. The transmission will shift down only if the driving speed is below the maximum speed of the next lower gear.
Selector lever positions

The selector lever permits adaptation of the automatic shifting process to specific operating conditions.

"P" Parking lock. The parking lock is an additional safeguard when parking the vehicle. Engage position "P" only with the vehicle stationary.

"N" Neutral. The engine can be started only with the selector lever shifted to position "P" or "N". No power is transmitted from the engine to the rear axle. With the brakes being released, the vehicle can coast freely. Engage "N" only when the vehicle is stationary or moving at low speed.

"4" Normal position.
All 4 gears are shifted automatically and consecutively. Position "4" affords optimum driving characteristics under almost all operating conditions.

"3" Transmission shifts up to 3rd gear only. Preferably used on slight uphill gradients to avoid alternate up and downshifting between 3rd and 4th gear and on slight downhill gradients in order to take advantage of the engine braking effect up to the maximum permissible engine speed in third gear. Refer to marks on speedometer or tachograph.

"2" Transmission shifts up to 2nd gear only. Preferably used on moderate uphill gradients to avoid alternate up and downshifting between 2nd and 3rd gear and on moderate downhill gradients in order to take advantage of the engine braking effect up to the maximum permissible engine speed in second gear. Refer to marks on speedometer or tachograph.

"1" Only 1st gear is at your disposal. Advantageous for the operation on steep uphill gradients and as brake downshifts within the permissible speed range of the 1st gear on steep downhill gradients.

"R" Reverse gear. Engagement and disengagement of reverse gear only with vehicle at standstill and engine idling.

Important notes
- When maneuvering the vehicle in limited space, control driving speed by gently...
releasing the service brake. Apply accelerator only slightly and do not pump the accelerator pedal.

- For short stops, e.g., at a traffic light, leave selector lever in the driving position and control vehicle with the brake. For extended stops with the engine running, shift to position „P“ or „N“.
- On long uphill gradients, particularly in case of heavy loads (operation with trailer), select lower gear range in time.

Engaging and disengaging differential lock

- The indicator light comes on or goes out only after the engaging/disengaging action in the differential case is completed.
- It may only be engaged when the vehicle is standing or travelling at low speed (walking speed).
- Do not engage lock while the drive wheels are spinning.
- When starting off, accelerate slowly.
- Change direction slightly several times if the indicator light fails to go out after the lock has been disengaged.

Caution! Never drive on a sealed road with the differential lock engaged.
Engagement/disengagement of power take-off

Manual transmission
The pto is engaged disengaged by means of a shift lever:
- lever to the rear = engaged
- lever pushed forward = disengaged.

Transmission with gearshift lock
- The power take-off can be engaged only when the transmission is in neutral.
- When the power take-off is engaged the transmission is locked.

Transmission without gearshift lock
- The power take-off can be operated with the vehicle at a standstill or driven in 1st or 2nd gear.

Caution! When the power take-off is engaged, do not change gears while driving.

Engagement/disengagement
With the vehicle at a standstill and the engine idling:
- Declutch (for approx. 3 to 6 seconds).
- Engage (or disengage) power take-off.
- Engage clutch.
3.5 Breaking in

With regard to service life, operational reliability and economical operation of the vehicle it is most important that the engine should not be run to the limit of its output during the break-in period.

**Break-in instructions**

Up to 2 000 km (1200 miles)

Vehicles with manual transmission

Break in gently.

Do not exceed \(\frac{3}{4}\) of top speed in each gear (refer to marks on speedometer or tachograph).

Load: without trailer

Vehicles with automatic transmission

Break in gently.

Please avoid: High engine loads (driving at full throttle), high engine speeds, avoid kickdown, if possible;

it is not recommended to brake the vehicle by means of manually shifting to a lower gear.

Load: without trailer

Over 2 000 km (1200 miles)

Gradually increase to full speed.

**Wheel mounting bolts or wheel securing nuts**

Retighten wheel securing bolts or nuts of new vehicles crossways after driving 50 km.

Observe specified tightening torque!
3.6 General driving instructions

Oil and fuel consumption depends on vehicle equipment, individual driving style and operating conditions.

Examples
Vehicle equipment:
- tires (size, inflation pressure, condition),
- body, air deflector,
- drive unit ratios,
- additional equipment (air conditioner, supplementary heater, pto, visco fan).

Style of driving:
- drive steadily at reasonable speeds, being aware of the road in front of you (avoid frequent acceleration and deceleration),
- engine speed (shift gears on time).

Operating conditions:
- trailer and dump body operation,
- hilly terrain,
- city and short distance traffic,
- vehicle loads,
- engine operation with vehicle stationary,
- frequent cold starts.

For these reasons no precise statements can be made on the fuel consumption of the individual vehicles. Max. oil consumption is approx. 1% of the fuel consumption. Regular vehicle maintenance is one of the prerequisites for favorable consumption.

The drive wheels must always be in firm contact with the ground (especially in off-the-road operations). If the wheels on one side of the live axle are spinning, serious damage to the differential will result because the load on the differential gears will then be excessive. Engage the differential lock, if provided.

When driving, observe the gauges and control lights on the instrument panel from time to time.
Travelling downhill, the vehicle determines the engine speed and the governor cannot limit it. In such a case the driver himself must make sure that the engine maximum revolutions are not exceeded in the individual gears. Observe marks on speedometer or tachograph. Negligence may cause damage to engine or propeller shaft.

**Coolant temperature gauge**

Depending on the operating conditions and the ambient temperature the operating temperature of the coolant during continuous operation may range from 85 to 110°C (pointer between white and red fields). Should the pointer be in the red field the vehicle must not be driven on.

**Charge indicator light**

If the charge indicator light comes on while the engine is running, stop vehicle, switch off engine and inspect poly-V-belt. **Caution!** Do not run engine without a poly-V-belt.

**Indicator light - brake fluid, brake pad wear**

The "brake fluid and brake pad wear" indicator light must go out when the engine has started.

The indicator light comes on:
- when the fluid level in the reservoir is too low,
- when the brake pads of the front wheel brake are worn.

The fluid level can be too low:
- if the hydraulic system is leaking,
- if the brake pads' linings are worn.

Have brake system checked immediately!
Braking
When driving downhill for long stretches, use engine braking effect by engaging a low-speed gear.

Automatic brake adjustment on the rear axle drum brake:
The brake shoes are adjusted automatically during braking while the vehicle is moving (secondary shoes are adjusted when the vehicle is moving forward and primary shoes during reversing).
For this reason, apply service brake at intervals when reversing.

Parking
Engage hand brake when stopping and parking the vehicle.
Vehicles equipped with MB automatic transmission: In addition to this, shift selector lever to position „P‟.
Secure a loaded vehicle or a vehicle parked for an extended period with at least one chock to prevent it from rolling away.

Caution! On uphill or downhill gradients of more than 15%:
- Secure empty vehicle at front axle with a chock.
- Secure loaded vehicle at rear axle with a chock.
When parking a vehicle at night on public roads in built-up area, switch on parking or standing lights.
Reflectors panels can also be used for this purpose if permitted by law.
3.7 Anti-lock braking system (ABS)

Irrespective of the road condition the ABS prevents the wheels from locking as of walking speed, provided a speed of approx. 5 km/h (3 mph) has been exceeded once after setting off.

Turn key in steering lock to driving position. The ABS indicator light on the instrument panel comes on.

The indicator light must go out after the engine has started.

A fault in the system is indicated if the indicator light
- fails to go out after starting off,
- comes on while driving.

Then the ABS is deactivated, but the effect of the service brake is retained. Have system checked immediately.

Caution! 208 D - 310 D, 210, 310
If the ABS has failed while braking the rear wheels may lock prematurely.

Braking with the ABS system

- The driver will notice the cutting-in of the ABS system by a slight vibration of the steering wheel and slight pulsation of the brake pedal.
- In emergencies the brake pedal should be fully depressed. This ensures control of all wheels and maximum vehicle deceleration.
- Always declutch on slippery roads in order that the engine braking effect cannot affect the operation of the ABS system.

The ABS system does not absolve the driver from the need to adapt his driving style to traffic and road conditions.

The ABS will for example not protect you from the consequences of insufficient bumper-to-bumper distance or excessive cornering speed.
3.8 Trailer

Vehicles with trailer coupling (coupling jaw)

Extreme care and caution must be used when coupling the trailer. Prior to the coupling operation, the trailer must be braked and secured by chocks under the wheels and its drawbar must be set to coupling height. Use caution when handling the drawbar - it may whip! No one must stand between tractor and trailer when the tractor is backing up!

Following the coupling operation, check the pertinent locking device or indicator (feeler pin or safety button) for proper seating of the trailer coupling bolt.

Vehicle with trailer coupling (ball head)

Secure the trailer so it cannot roll away. Back up vehicle until the drawbar can be engaged in the pintle hook. Engage drawbar and lock.

Caution!

Trailer coupling with detachable ball neck! Comply with manufacturer’s instructions.

Connection of cable:

The cable should be routed so that it will yield easily during cornering without kinking or chafing.

Before connecting the cable, check the voltage of the consuming units on the trailer.
3.9 Winter operation

Corrosion inhibition

The vehicle is provided with cavity protection coating and underseal as standard.

- Wash the vehicle more often during the cold season to remove adhering road salts and deposits of salty splash water from underbody, trailer coupling, painted and chromium-plated parts. Road salts are aggressive!
- The vehicle should be regularly inspected for corrosion. Brake, air, and oil lines should be checked with particular care.
- As preventive measure, spray vehicle underside with wax-based preservative. Refer to section 5.13.

Engine oils

If all-season oil is not used change engine oil in good time before the onset of the cold season and fill engine with oil of the specified SAE grade. Refer to section 4.1.

Lubrication

Chassis and brake system suffer particularly from the influence of snow and snow sludge. Timely and thorough cleaning and greasing will contribute to avoid premature wear and increase operational reliability.

Coolants

Check coolant for its resistance to freezing several times during the cold season. Refer to section 4.2.
Diesel fuel (208 D – 410 D)

Winter grade diesel fuel of a sufficient fluidity is to be used during prolonged cold periods. Refer to section 4.3.

General driving instructions
- Use tires whose treads ensure good grip.
- Adapt your driving style to road conditions.
- Prevent the drive wheels from spinning (damage to differential).
- On snow, slush and ice, mount tire chains on the rear wheels on time. Comply with manufacturer’s mounting instructions.
4 Service products

Components and lubricants must match. Therefore, only brands tested and recommended by us must be used. They are included in the MERCEDES-BENZ Specifications for Service Products. Corresponding sheet numbers are listed in section „4.4 Capacities - summary“. MERCEDES-BENZ service stations will give you all the information.

4.1 Engine oils

The suitability of the various engine oils is specially tested in our engines. For this reason, only use engine oils which have been recommended by our company. MERCEDES-BENZ service stations have all the information on recommended brands.

Caution:

In order to ensure sufficient lubrication of the moving parts, select engine oil viscosity (SAE grades) according to ambient temperature. Uncompounded engine oils must not be used!

The MERCEDES-BENZ factory or your service station fills a new or a reconditioned engine with an initial operation oil. This is an oil which was specially developed for the operating conditions during the first 500 to 1 500 km (300 to 900 miles).

If the oil level reaches the minimum mark on the dipstick before the inspection (500 - 1 500 km 300 - 900 miles), the engine may be topped up with recommended engine oil if no initial operation oil is available.
4.2 Coolant

Coolant is a mixture of water and anticorrosion/antifreeze agent. For reasons of corrosion protection and in order to raise the boiling point, the coolant must remain in the cooling system all year round. Renew coolant every third year since the anticorrosion effect deteriorates.

Water

Water alone is not permitted to be used as coolant, even if no antifreeze properties are required. Water used as coolant must, however, meet specific requirements which are often but not always met by potable water. Should the quality of the water be insufficient, this water must be conditioned. Any MERCEDES-BENZ service station will advise you accordingly.

Anticorrosion/antifreeze agents

During operation, the proportion of anticorrosion/antifreeze agent in the coolant must not drop below 40% by volume (this corresponds to antifreeze protection to \(-25^\circ C\)/\(-13^\circ F\)). The anticorrosion properties are no longer ensured if the proportion is lower.

To prevent damage to the cooling system:
- Only use an approved brand of anticorrosion/antifreeze agent. Any MERCEDES-BENZ service station will advise you accordingly.
- A proportion of 50% by volume of anticorrosion/antifreeze agent (antifreeze protection to \(-37^\circ C\)/\(-35^\circ F\)) must be ensured when replenishing the system (after coolant losses).
- Never use any more than 55% by volume (= maximum antifreeze protection) of anticorrosion/antifreeze agent. Antifreeze protection and heat dissipation are reduced.
Coolant mixing ratio

<table>
<thead>
<tr>
<th>Antifreeze to °C (°F)</th>
<th>Water % by volume</th>
<th>Anticorrosion/antifreeze agent % by volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>-37 (-35)</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>approx. -45 (-49)</td>
<td>45</td>
<td>max. 55</td>
</tr>
</tbody>
</table>

4.3 Diesel fuels

Only use commercially available vehicle diesel fuels. Marine diesel fuels, heating oils or the like must not be used.

Change engine oil as under severe operating conditions (see Maintenance Booklet) if diesel fuels are used whose sulphur content exceeds 0.5 % by weight.

When fuel is filled from barrels, it should be passed through a filter, a piece of chamois leather or even a clean flannel cloth, inserted into the filler neck.

If diesel fuel has been spilt, the affected spot can be cleaned by using a mixture of 25 to 50 % vinegar and 75 to 50 % water (depending on the degree of contamination). This will help to get rid of the offensive odor.
The use of kerosene in road vehicles is not permitted in some countries, e.g. UK. Therefore consult the authorities before such mixtures are used.

Diesel fuels at extremely low temperatures

At low ambient temperatures the fluidity of diesel fuel may become insufficient due to paraffin separation. To avoid malfunctions, diesel fuels with improved fluidity are marketed during the cold season. If winter diesel fuel is used, there will usually be no malfunctions at ambient temperatures as low as approx. -15°C (5°F). Trouble-free operation with winter-grade diesel fuel is generally possible down to approx. -23°C (-9.5°F) as a result of the fuel preheater which is switched on when the vehicle heater is operating.

Depending on the ambient temperature, add a certain quantity of kerosene or flow improver if only summer diesel fuel or less cold-resistant winter diesel fuel is available or if the ambient temperature drops below -15°C (5°F). However, the efficiency of the flow improver cannot be guaranteed for every brand of fuel. Flow improvers can also be combined with regular gasoline or kerosene. Comply with manufacturers' recommendations. Every MERCEDES-BENZ service station will advise you on approved flow improvers.

Exceptionally, if no kerosene or flow improver is available, leaded or unleaded regular gasoline may also be used. Premium fuels must not be used for blending. For mixing ratio, refer to chart.

The engine power may drop depending on the proportion of supplementary fuel. For this reason, keep percentage of fuel added to the minimum necessitated by the ambient temperature.

Percentage of supplementary fuel:
- Max. proportion of kerosene 50%.
- Max. proportion of regular gasoline 30% (a maximum of 20% for vehicles with fuel preheating system).

Pour the additive into the diesel fuel before its fluidity becomes insufficient because of paraffin separation. Failures due to paraffin separation can be eliminated only by heating the entire fuel system.

For safety reasons, only blend kerosene or regular gasoline with diesel fuel in the fuel tank. For this purpose, pour in kerosene or regular gasoline first and then diesel fuel.

1 The use of kerosene in road vehicles is not permitted in some countries, e.g. UK. Therefore consult the authorities before such mixtures are used.
Idle the engine for some time so the supplementary fuel can enter the entire fuel system

**Caution:**
Adding gasoline or kerosene will lower the flash point of the diesel fuel. This increases the dangers when this fuel mixture is handled. Comply with the respective safety regulations.

### Vehicles without fuel preheating system

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Summer diesel fuel %</th>
<th>Supplementary diesel fuel %</th>
<th>Winter diesel fuel %</th>
<th>Supplementary diesel fuel %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to -10 (32 to 14)</td>
<td>70</td>
<td>30</td>
<td>100</td>
<td>-</td>
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<tr>
<td>-10 to -15 (14 to 5)</td>
<td>50</td>
<td>50</td>
<td>100</td>
<td>-</td>
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<tr>
<td>-15 to -20 (5 to -4)</td>
<td>-</td>
<td>-</td>
<td>70</td>
<td>30</td>
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<tr>
<td>-20 to -25 (-4 to -13)</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>

### Vehicles with fuel preheating system

<table>
<thead>
<tr>
<th>Ambient temperature</th>
<th>Summer diesel fuel %</th>
<th>Supplementary diesel fuel %</th>
<th>Winter diesel fuel %</th>
<th>Supplementary diesel fuel %</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 to -15 (32 to 5)</td>
<td>80</td>
<td>20</td>
<td>100</td>
<td>-</td>
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<tr>
<td>-15 to -23 (5 to 9)</td>
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<td>100</td>
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<td>-</td>
<td>80</td>
<td>20</td>
</tr>
<tr>
<td>-30 to -35 (-22 to -31)</td>
<td>-</td>
<td>-</td>
<td>50</td>
<td>50</td>
</tr>
</tbody>
</table>
### 4.4 Capacities - summary

<table>
<thead>
<tr>
<th>Model</th>
<th>Capacities, approx.</th>
<th>Service products</th>
<th>Sheet No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine with oil filter</td>
<td></td>
<td>Engine oil, refer to section 4.1</td>
<td>226.0/1/5, 227.0/1/5, 228.0/2/3</td>
</tr>
<tr>
<td></td>
<td>601 601.9.. max. 7 l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 5 l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>602 602.9.. max. 7 l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 5,5 l</td>
<td></td>
</tr>
<tr>
<td></td>
<td>102 102.9.. max. 4,5 l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>min. 2,8 l</td>
<td></td>
</tr>
<tr>
<td>Manual transmission + P.T.O.</td>
<td>711.1.. 2,3 l</td>
<td>Automatic transmission fluid (ATF) or gear oil</td>
<td>236.2, 237</td>
</tr>
<tr>
<td></td>
<td></td>
<td>+ 0,5 l</td>
<td></td>
</tr>
<tr>
<td>Automatic transmission</td>
<td>722.3.. 6,2 l</td>
<td>Automatic transmission fluid (ATF) Dexron II</td>
<td>236.4, 236.6, 236.7</td>
</tr>
<tr>
<td>Rear axle</td>
<td>HL 0:1-1,7 741.406, 741.437 1,5 l</td>
<td>Hypoid gear oil SAE 90</td>
<td>235</td>
</tr>
<tr>
<td></td>
<td>HL 0.2-2,2 741.404, 741.436, 741.438, 741.439 1,8 l</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>HL 0.3-3,3 741.5.. 1,8 l</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Manual steering</td>
<td>760.2.. 0,5 l</td>
<td>Steering gear oil</td>
<td>236.3</td>
</tr>
<tr>
<td>Power steering</td>
<td>765.5.. 1,6 l</td>
<td>Automatic transmission fluid (ATF) or steering gear oil or gear oil</td>
<td>236.2, 236.3, 237</td>
</tr>
<tr>
<td>Clutch and brake systems -</td>
<td></td>
<td>Brake fluid (DOT 4 plus)</td>
<td>331.0</td>
</tr>
<tr>
<td>hydraulic sections, hydraulic</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>differential lock control</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Grease nipples on chassis and</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>body</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Battery terminals</td>
<td></td>
<td>Bosch Ft 40 v 1</td>
<td>350</td>
</tr>
</tbody>
</table>

\(^1\)Not suitable for severe operating conditions
<table>
<thead>
<tr>
<th>Model</th>
<th>Capacities, approx.</th>
<th>Service products</th>
<th>Sheet No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel tank</td>
<td>70 l</td>
<td><strong>208 D – 410 D</strong>&lt;br&gt;Diesel fuel, refer to section 4.3</td>
<td>132.1-132.3, 137</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>210 – 410 Vehicles with catalyst</strong>&lt;br&gt;Regular-grade gasoline, unleaded, min. 91 RON/82.5 MON</td>
<td>122.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>210 – 410 Vehicles without catalyst</strong>&lt;br&gt;Premium-grade gasoline, unleaded, min. 95 RON/85 MON&lt;br&gt;or premium-grade gasoline, leaded, min. 98 RON/88 MON</td>
<td>122.1, 122.2</td>
</tr>
<tr>
<td>Cooling system</td>
<td></td>
<td><strong>Engine 601</strong>&lt;br&gt;601.9.. 7 l&lt;br&gt;Coolant, refer to section 4.2</td>
<td>310, 325.1</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Engine 602</strong>&lt;br&gt;602.9.. 7 l&lt;br&gt;Coolant, refer to section 4.2</td>
<td>310, 325.1, 325.2</td>
</tr>
<tr>
<td></td>
<td></td>
<td><strong>Engine 102</strong>&lt;br&gt;102.9.. 7,5 l&lt;br&gt;Coolant, refer to section 4.2</td>
<td>310, 325.1, 325.2</td>
</tr>
<tr>
<td>Windshield washer system</td>
<td>7 l</td>
<td><strong>Water plus MB-windshield detergent S in summer and detergent W in winter.</strong>&lt;br&gt;Note mixing ratio.</td>
<td>371</td>
</tr>
</tbody>
</table>
5 Vehicle service and maintenance

Like any other technical equipment, the vehicle requires service and maintenance. Scope and frequency of the service work depend mainly on operating conditions which, in turn, may vary to a considerable degree.

The enclosed Maintenance Booklet includes:
- information on maintenance categories,
- scope and frequency of maintenance work,
- notes on warranty,
- number of lubrication points,
- Vehicle data card.

The MERCEDES-BENZ service station certifies the jobs carried out in the Maintenance Booklet. A small sticker, attached to the door post of the driver’s door by the MERCEDES-BENZ service station, is a reminder of the coming service or maintenance work.

Special skills are required for inspections and maintenance work. They cannot be taught within the scope of these instructions. It is recommended to have these jobs performed by the trained personnel which is at your disposal in the large number of MERCEDES-BENZ service stations.

Expert service is guaranteed by experience and regular technical instructions from the factory, by workshop equipment and service tools.

Should any service and maintenance jobs have to be carried out on a do-it-yourself basis for organizational reasons, meet environmental protection requirements. For the disposal of fuels, coolants and lubricants for example, observe legislation. This also applies to those parts which come into contact with the fuels, coolants and lubricants (e.g. filters).

Operate stationary engine no longer than necessary. When working on the vehicle, adhere to safety regulations.

Floor jacks, lifting platforms or jack stands may be positioned only under the front axle, below the rear axle housing, i.e. at rear axle support tubes underneath the springs.

Position double-post lifting platforms at the specified frame supporting points. Before lifting the vehicle, clamp it to the support arms of the lifting platform.
Vehicles which do not correspond to standard specifications with respect to wheelbase, length of overhang, permissible axle loads and special structures over front and rear end must not be lifted up with a double-post lifting platform. In addition to this special regulations must be complied with. Any MERCEDES-BENZ service station will advise you accordingly.

All MERCEDES-BENZ service stations store the MERCEDES-BENZ original spare parts required for maintenance and repair work. Besides this bases are provided all over the globe intended to ensure the rapid supply of MERCEDES-BENZ original spare parts. More than 310,000 different spare parts, even for rather old vehicle models, are furthermore stocked in the central plant warehouses.

We guarantee maximum operational efficiency and reliability as well as optimum retention of the vehicle value when MERCEDES-BENZ original spare parts are installed, as they are subjected to most severe quality inspections. Each part has been specifically developed, manufactured or selected for and adapted to MERCEDES-BENZ vehicles.

In the Federal Republic of Germany and in a number of other countries certain parts are authorized to be installed or attached only if they comply with current legislation. This prerequisite is definitely met by original MERCEDES-BENZ parts. If other parts are used the operating permit may expire. For this reason, only MERCEDES-BENZ original spare parts should be installed.

**Vehicle tools and emergency equipment**

Depending on the vehicle model the vehicle tools are stowed:
- in the assistant driver's seat base,
- behind the assistant driver's seat base,
- below the rear seat bench,
- on the RH side in the vehicle rear end.

Emergency equipment is attached to the driver's and assistant driver's seat bases.
5.1 Engine

5.1.1 Technical data

<table>
<thead>
<tr>
<th>Vehicle</th>
<th>208 D/308 D/408 D</th>
<th>210 D/310 D/410 D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engine</td>
<td>601</td>
<td>602</td>
</tr>
<tr>
<td>No of cylinders</td>
<td>601.9</td>
<td>602.9</td>
</tr>
<tr>
<td>No of cylinders</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td>Bore 89 mm</td>
<td>89 mm</td>
<td>89 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>92.4 mm</td>
<td>92.4 mm</td>
</tr>
<tr>
<td>Total displacement$^1$</td>
<td>2299 cm$^3$</td>
<td>2674 cm$^3$</td>
</tr>
<tr>
<td>Compression ratio, approx.</td>
<td>22</td>
<td>22</td>
</tr>
<tr>
<td>Min. compression pressure (engine warmed up)</td>
<td>24 bar</td>
<td>24 bar</td>
</tr>
<tr>
<td>Brake horsepower$^2$ kw (HP) at 1/min</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles with manual transmission</td>
<td>58 (79) /3800</td>
<td>70 (95) /3800</td>
</tr>
<tr>
<td>Vehicles with automatic transmission</td>
<td>60 (82) /4000</td>
<td>72 (98) /4000</td>
</tr>
<tr>
<td>Max. torque in Nm</td>
<td>157 at 2000 - 2800 min</td>
<td>192 at 2400 - 2600/min</td>
</tr>
<tr>
<td>Idling speed</td>
<td>750 /min</td>
<td>700 /min</td>
</tr>
<tr>
<td>Injection order</td>
<td>1 - 3 - 4 - 2</td>
<td>1 - 2 - 4 - 5 - 3</td>
</tr>
<tr>
<td>Ejection pressure of injection nozzles</td>
<td></td>
<td></td>
</tr>
<tr>
<td>New nozzles</td>
<td>115 - 123 bar</td>
<td>115 - 123 bar</td>
</tr>
<tr>
<td>Used nozzles</td>
<td>at least 100 bar</td>
<td>at least 100 bar</td>
</tr>
<tr>
<td>Poly-V-belt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles without power steering</td>
<td>1015 mm</td>
<td>1015 mm</td>
</tr>
<tr>
<td>Vehicles with power steering</td>
<td>2000 mm</td>
<td>2000 mm</td>
</tr>
<tr>
<td>Vehicles with power steering and air conditioning system</td>
<td>2080 mm</td>
<td>2080 mm</td>
</tr>
</tbody>
</table>

1 88:76 ECC
2 80-1269 ECC (with modification: 88 195 EEC)
<table>
<thead>
<tr>
<th>Vehicle</th>
<th><strong>210/310/410</strong></th>
<th><strong>210/310/410</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>without catalyst</td>
<td>with closed-loop system catalyst</td>
</tr>
<tr>
<td>Engine</td>
<td>102</td>
<td>102</td>
</tr>
<tr>
<td>Model</td>
<td>102.9</td>
<td>102.9</td>
</tr>
<tr>
<td>No of cylinders</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Bore</td>
<td>95.5 mm</td>
<td>95.5 mm</td>
</tr>
<tr>
<td>Stroke</td>
<td>80.20 mm</td>
<td>80.25 mm</td>
</tr>
<tr>
<td>Total displacement</td>
<td>2 298 cm³</td>
<td>2 299 cm³</td>
</tr>
<tr>
<td>Compression ratio, approx.</td>
<td>9</td>
<td>8</td>
</tr>
<tr>
<td>Min. compression pressure (engine warmed up)</td>
<td>8.5 bar</td>
<td>7.5 bar</td>
</tr>
<tr>
<td>Brake horsepower¹ kw (HP) at 1 min</td>
<td>77(105)/5 100</td>
<td>70(95)/5 200</td>
</tr>
<tr>
<td>Max. torque in Nm</td>
<td>182 at 2 000 - 2 700/min</td>
<td>170 at 2 500/min</td>
</tr>
<tr>
<td>Idling speed</td>
<td>750 - 850/min</td>
<td>700 - 800/min</td>
</tr>
<tr>
<td>Firing order</td>
<td>1-3-4-2</td>
<td>1-3-4-2</td>
</tr>
<tr>
<td>Ignition timing - basic setting</td>
<td>10° before TDC</td>
<td>10° before TDC</td>
</tr>
<tr>
<td>Stroboscopic check at idle without vacuum</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spark plugs</td>
<td>Bosch H 7 DCO, Beru 14 K-7 DUO, Champion S 9 YCC</td>
<td>Bosch H 8 DCO, Beru 14 K-8 DUO, Champion S 10 YCC</td>
</tr>
<tr>
<td>Electrode gap</td>
<td>0.8 mm + 0.1</td>
<td>0.8 mm + 0.1</td>
</tr>
<tr>
<td>Poly-V-belt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicles without power steering</td>
<td>1 020 mm</td>
<td>1 020 mm</td>
</tr>
<tr>
<td>Vehicles with power steering</td>
<td>1 885 mm</td>
<td>1 885 mm</td>
</tr>
<tr>
<td>Vehicles with power steering and air conditioning system</td>
<td>1 980 mm</td>
<td>1 980 mm</td>
</tr>
</tbody>
</table>

¹ 80 1269-EEC (with modification 88 195 EEC)
5.1.2 Tightening torques in Nm

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil filter cover</td>
<td>23</td>
</tr>
<tr>
<td>Oil drain plug - oil pan</td>
<td>25</td>
</tr>
<tr>
<td>Spark plugs</td>
<td>10 - 20</td>
</tr>
<tr>
<td>Hose clamps</td>
<td>2.5</td>
</tr>
</tbody>
</table>

5.1.3 Oil and filter change

Oil change should be performed immediately after an extended trip while the oil is still hot and thin.

- Vehicles with noise encapsulation: remove engine covering.

- Remove dipstick, extract oil with oil extractor or unscrew oil drain plug and drain oil. Clean drain plug.

**Engine 601, 602**

- Prior to removing the oil filter, place oil catch pan under oil filter housing.
- Loosen but do not unscrew oil filter cover securing nuts.
- Pull off cover from oil filter housing in order that the oil may drain.
- Unscrew securing nuts of oil filter cover and remove cover.
- Replace filter element and sealing ring.
- Position cover while paying attention to proper seating of the gasket, turn in and tighten nuts.
  Observe tightening torque.

Engine 102

- Prior to removing the oil filter, place oil catch pan under oil filter housing.
- Loosen but do not unscrew oil filter cover center bolt.
- Pull off cover from oil filter housing in order that the oil may drain.
- Unscrew center bolt and remove cover.
- Renew filter element and all sealing rings.
- Position cover while paying attention to proper seating of the gasket, turn in and tighten center bolt.
  Observe tightening torque.

Engine 601/602/102

- Screw in and tighten oil drain plug. Observe tightening torque.
- Fill engine with oil.
- Start engine and idle for a short while. Observe oil pressure indicator light. The indicator light must go out after a few seconds.
- Shut off engine.
- Check oil filter and oil drain plug for leaks.
- Check engine oil level and top up oil to the upper dipstick mark.
5.1.4 Renewal of air cleaner element

Vehicles with engine 601/602
- Disengage locking spring.
- Turn spin-on filter counterclockwise and detach.
- Clean filter housing.
- Position new spin-on filter on filter housing and tighten clockwise.
- Engage locking spring. Check locking spring for tension and correct seating.

Vehicles with engine 102
- Open clamps of filter housing.
- Detach filter cover and remove filter element.
- Clean filter housing, cover, gaskets and sealing areas.
- Install new filter element in filter housing.
- Replace filter cover.
  Check clamps for correct seating and adequate tension.
5.1.5 Poly-V-belt

The poly-V-belt is automatically retensioned.

Poly-V-belt - check condition

The belt may not be damaged or worn (e.g. transverse cracks, broken out V-sections, frayed or loosened tensile strands, pointed V-shape).

Have damaged poly-V-belts renewed in a MERCEDES-BENZ Service Station.

Operation diagram of poly-V-belt
1 Crankshaft
2 Three-phase alternator
3 Fan, coolant pump
4 Idler pulley
5 Power steering pump
6 Refrigerant compressor
7 Guide pulley
5.2 Fuel system

210 - 410

The carburetor is set to optimum efficiency and most economical fuel consumption in the works.

Caution:
Have adjustments to carburetor and throttle linkage carried out at a MERCEDES-BENZ service station only. Emission levels specified in emission control legislation must not be exceeded.

208 D - 410 D

The injection pump requires no maintenance. Inspections and adjustments should exclusively be carried out at MERCEDES-BENZ service stations.

5.2.1 Fuel prefilter

Regularly check fuel prefilter for soiling (visual inspection). Replace, if required.
Caution! Arrow on filter housing points in direction of flow.

5.2.2 Replacing the fuel filter element

- Unscrew securing screw of filter and remove filter element.
- Replace sealing ring of securing screw and install a new filter element.
- Finally bleed fuel system.
5.2.3 Bleeding the fuel system

- Depress accelerator pedal.
- Start engine.
  The fuel system is bled if the engine starts.

5.3 Cooling system

Caution! Keep air intake free. Do not attach any posters, badges or other trim in the region in front of the radiator. The cooling temperature is controlled by one thermostat. The gradual rise of the cooling temperature above the usual level indicates a failure in the cooling system. The cause may be lack of cooling water, a clogged radiator, slack poly-V-belt, a faulty thermostat or a defective fan with fluid coupling. Check cooling and heating system for leaks at regular intervals and renew hoses, if required.
5.3.1 Checking radiator for soiling, cleaning

Radiator fins should not be clogged by dirt. Blow compressed air through the radiator, first from the fan side and then from front, or spray with water (unscrew radiator grille first). Use steam cleaner if badly contaminated. Note: Avoid damage to radiator fins, guide compressed air, water or steam jet at right angles to radiator.

5.3.2 Draining and replenishing cooling system

Remove cap of coolant expansion tank only if the coolant temperature is less than 90°C/194°F.

Draining:
- Open water control valve of heater
- Vehicles with noise encapsulation: remove engine covering.
- Remove cap of coolant expansion tank.
- Unscrew drain plugs.
  They are located:
  on the underside of the radiator,
  on the RH engine side.
- Having drained the coolant, check if the drain ports are clogged with residual matter.
- Screw in drain plugs.

Filling:
- Fill with coolant to the marking in the filler neck.
- Replace cap of the coolant expansion tank and tighten to the stop.
- Start engine and run for approx. 1 minute at varying speeds.
- Shut off engine and remove cap of coolant expansion tank.
- Top up with coolant to the marking in the filler neck.
- Replace cap of the coolant expansion tank and tighten to the stop.

5.4 Clutch

The clutch is adjusted automatically.
Adjustments or repairs should only be carried out at a MERCEDES-BENZ service station.
5.5 Transmission

5.5.1 Manual transmission

5.5.1.1 Tightening torque in Nm

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil drain plug</td>
<td>70 ± 15</td>
</tr>
</tbody>
</table>

5.5.1.2 Oil level check and oil change

Prior to unscrewing the screw plug, carefully clean surrounding area. Change oil immediately after an extended trip while it is still hot and thin. Vehicles with noise encapsulation: remove transmission covering.

Oil level check:
- Unscrew oil filler plug. The oil level in the correctly filled transmission reaches the lower edge of the filler hole in the transmission housing.
- Add oil through the filler hole, if required.
- If the oil level is checked with the transmission at operating temperature, do not allow any emerging oil to drain.
- Clean, screw in and tighten oil filler plug.

Draining oil:
- Unscrew oil drain plug and oil filler plug.
- Power take-off: Unscrew oil drain plug.
- Clean oil filler and drain plugs, screw in and tighten.

Filling with oil:
- Pour oil through the filler hole in the transmission housing until the level reaches the lower edge of the filler hole.
- Clean, screw in and tighten oil filler plug.

5.5.1.3 Cleaning breather

Clean exterior of breather on the transmission housing as otherwise pressure develops in the transmission housing which may cause loss of oil.
5.5.2 MB automatic transmission (optional)

Caution!
Engage hand brake and move selector lever to gearshift position „P“ when working on a vehicle with automatic transmission whose engine is idling.

5.5.2.1 Tightening torques in Nm

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil pan securing screws</td>
<td>7</td>
</tr>
<tr>
<td>Oil filter securing screws</td>
<td>4</td>
</tr>
<tr>
<td>Oil drain plugs</td>
<td>14</td>
</tr>
</tbody>
</table>

5.5.2.2 Oil level check

Check oil level with the vehicle parked on level ground.
- Run engine for approx. 1 – 2 minutes.
- Pull up locking lever on dipstick and leave up for the check.
- Check oil level on dipstick with the engine idling.
  The transmission oil level varies with the oil temperature.
  If the transmission is at operating temperature (80°C/176°F), the oil level should be between the dipstick lower and upper marking. If the transmission is cold (20 to 30°C/68 to 86°F), max. oil level should be approx. 10 mm below the lower dipstick marking.

Notes:
- Absolute cleanliness must be observed. The slightest impurity may cause operating troubles.
- To wipe the dipstick, do not use any woollen fabric (risk of fluff).
- To top up, use special tool or a funnel with a fine-mesh strainer.
5.5.2.3 Oil and filter change

Change oil immediately after an extended trip while it is still hot and thin.

Draining oil from the transmission:
- Unscrew oil drain plug and drain oil.

Draining oil from the torque converter:
- Rotate torque converter until the drain plug in the opening of the torque converter housing becomes visible.
- Unscrew drain plug and drain oil.
- Renew sealing rings.
- Screw in and tighten oil plug.
  Observe tightening torque.

Filter change:
- Detach oil pan and clean.
- Renew filter.
- Check oil pan gasket for damage and renew if required. Attach oil pan.
  Observe tightening torques.

Filling with oil:
Use special tool or a funnel with fine-mesh strainer.
- First pour in approx. 4 liters of oil through the oil filler pipe.
- Start engine and run it at idle.
- Pour in the rest of the oil while the engine is running.
- Shift selector lever through all positions and return it to position „P“.
- Inspect oil level while the engine is operating. Add oil, if necessary.
- Check transmission and lines for leaks.
5.6 Front axle

5.6.1 Tightening torque in Nm

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring U-bolt</td>
<td>80</td>
</tr>
</tbody>
</table>

5.7 Rear axle

5.7.1 Tightening torques in Nm

<table>
<thead>
<tr>
<th>Component</th>
<th>Torque (Nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spring U-bolt</td>
<td>80</td>
</tr>
<tr>
<td>Rear axle cover</td>
<td>40 - 50</td>
</tr>
</tbody>
</table>

5.7.2 Oil level check and oil change

Prior to unscrewing the screw plug, carefully clean surrounding area. Change oil immediately after an extended trip while it is still hot and thin.

Oil level check:
- Unscrew oil filler plug. The rear axle is filled correctly if the oil level reaches the lower edge of the filler hole in the differential.
- Add oil through the filler hole, if required.
- Should the oil level be checked with the front axle warmed up, do not allow any emerging oil to drain.
- Clean, screw in and tighten oil filler plug.

Draining oil:
- Unscrew oil drain plug and oil filler plug.
- Clean, screw in and tighten oil filler plug.

Filling with oil:
- Pour oil through the filler hole in the differential until the oil level reaches the lower edge of the filler hole.
- Clean, screw in and tighten oil filler plug.
5.8 Steering

For safety reasons, perform maintenance jobs at regular intervals. Such work demands special skills and should only be carried out at MERCEDES-BENZ service stations.

Power steering:
In case of emergency, i.e. when the hydraulic system fails, the vehicle can continue to be steered with increased effort because the mechanical power transmission is retained.

5.8.1 Technical data

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Toe-in (measured on the wheel flange)</strong></td>
<td>0 ± 2 mm</td>
</tr>
<tr>
<td><strong>Camber</strong></td>
<td>1° ± 20'</td>
</tr>
<tr>
<td><strong>Kingpin inclination</strong></td>
<td>5° ± 20'</td>
</tr>
<tr>
<td><strong>Caster</strong></td>
<td>2° 30' ± 20'</td>
</tr>
</tbody>
</table>

5.8.2 Tightening torques in Nm

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pitman arm mounting</strong></td>
<td>400</td>
</tr>
<tr>
<td><strong>Tie rod adjuster clamp</strong></td>
<td>45 – 55</td>
</tr>
<tr>
<td><strong>Conical joints – tie rod</strong></td>
<td>90 – 100</td>
</tr>
</tbody>
</table>
5.8.3 Checking oil level

Manual steering
- LHD-vehicles
  Turn steering wheel all the way to the left.
- RHD-vehicles
  Turn steering wheel all the way to the right.
- Clean area around screw plug before unscrewing the plug!
  When the steering gear is correctly filled, the oil level is 35 – 45 mm from the upper edge of the filler hole.

Power steering
- Regularly check the oil level in the power steering reservoir.
- With the engine running the oil level must be between the upper and the lower dipstick marking.

5.8.4 Checking the toe-in

For all measurements on the front axle, position vehicle on a perfectly level surface. The tires must be inflated to equal pressure. Looseness in wheel bearings, tie rod ends and drag link ends must not be tolerated.

The toe-in may be checked on an empty or loaded vehicle.
- To measure toe-in (steering in straight-ahead position), mark measuring points on the rim flange in front of the axle at wheel center height, using chalk or colored pencil.
- Measure the distance between these two points.
- Move the vehicle backwards or forwards 1/2 wheel rotation and measure the distance between the two points which are located behind the front axle. The difference in measurement between the distance of the two points before and after the wheel rotation is the amount of toe-in.
- Toe-in is adjusted by pushing one end of the tie rod out of the steering arm by means of a pusher (special tool).

Aim for a toe-in of „0“ as this means minimum tire wear. Observe torque to which the nuts have to be retightened.
5.9 Wheels and tires

5.9.1 Tightening torques in Nm

Wheel mounting bolts or securing nuts  160 – 180

5.9.2 Spare wheel location

Spare wheel below chassis frame end:

Vehicles 208 D – 310 D, 210, 310

- Pull off thread protection caps.
- Completely unscrew securing nuts on LH side.
- Lower spare wheel carrier.
- Unscrew securing screw and remove spare wheel.

Vehicles 408 D, 410 D, 410

- Turn out securing nuts.
- Lift spare wheel carrier.
- Swing securing bolts outwards.
- Lower spare wheel carrier.
- Unscrew securing screw and remove spare wheel.

Spare wheel below cargo body:

- Unscrew the securing screws.
- Remove spare wheel from the side and unscrew spare wheel from carrier.
5.9.3 Wheel change

For tool kit, refer to page 60.

Caution! When changing wheels, observe:
- Tire load capacity (PR)
- Tire inflation pressure, refer to "Tire pressure chart" (last page).

Make sure the vehicle cannot roll off.

Positioning the jack at front end:
- Under the pertinent spring, directly in front of the front axle.

Positioning the jack at rear end:
- At the rear axle below the support tube, under no circumstances under the differential housing.

Be cautious when removing the wheels.
- Do not damage the threads on the bolts when removing or installing the disk wheels.
- Before disk wheels are positioned, remove rust and dirt from contact surfaces of the wheel hubs, brake drums, rims and wheel mounting bolts or securing nuts.
- Apply some graphite paste to bolts or nuts in order to avoid "jamming" of the wheel mounting bolts or wheel securing nuts.

Disk wheels centering via spherical spring washers and wheel studs:
- Prior to positioning the inner wheel (twin wheels) make sure all spherical rings are properly seated.
- After having positioned the outer wheel, screw in and tighten two to three wheel stud nuts together with spherical spring washers.
- Make sure wheel is correctly centered (wheel bolts exactly in the center of the wheel disk holes).
- Position and tighten remaining spherical spring washers and wheel stud nuts.

The mounting bolts or securing nuts of a changed wheel must be checked after 50 km (30 miles) and retightened, if necessary. Thereafter periodic inspections will do.
- Wheel mounting bolts or securing nuts are to be tightened crosswise.
  Observe tightening torques!
5.10 Brake system

5.10.1 Checking the brake lines

Regularly check brake lines for leaks and be sure they are in good condition. Brake lines showing even minor damage must be replaced. Brake lines must be replaced if signs of corrosion (pitting), chafing, crushing etc. are visible. This work requires special skills and should only be performed at a MERCEDES-BENZ service station.

5.10.2 Checking brake pad/lining thickness

When minimum thickness is reached, replace brake pads or brake linings immediately. This work requires special skills and should only be performed at a MERCEDES-BENZ service station.

Disk brakes (front)
- Check pad thickness through one of the openings in the disk wheels (use a light for visual inspection). Rotate disk wheels if required.
Minimum pad thickness: 2 mm.

Drum brake (rear)
- Thickness of rear wheel brake linings must be regularly checked through the inspection holes (inner side of wheel - brake anchor plate).
Minimum lining thickness: 3 mm.
5.11 Electrical system

5.11.1 Technical data

Three-phase alternator
Output
Optional

Starter motor
Design
Output
preengaged drive starter

Engine 601, 602
12 V 2,2 kW

Engine 102
12 V 1,4 kW

Batteries
Engine 601, 102
12 V 66 Ah
Optional
12 V 88 Ah
or 2 x 12 V 66 Ah
or 2 x 12 V 88 Ah

Engine 602
12 V 88 Ah
Optional
2 x 12 V 88 Ah

5.11.2 Power collection – additional consuming units

For the installation of additional electrical consuming units, observe the following:
- do not connect any further loads to occupied fuses,
- do not connect any additional cables to the existing cables (e. g. with a cutting clip),
- sufficiently protect consuming units by means of additional fuses.
5.11.3 Fuses

(For fuse assignment, refer to the inner side of fuse box cover)

- All points of connection must be in positive contact with each other. For the return of the current, make sure all power consuming units are well grounded.
- Damaged cables must be insulated by means of insulating tape.
- Faulty fuses must be replaced instead of repaired.
- Be sure to remove the cause of a burnt out fuse prior to replacing the fuse. Replace used spare fuses.
- Prior to performing work on the electrical system, the negative (-) battery terminals must be disconnected from the battery posts.

5.11.3.1 Testing fuses

Fuses can be function-tested in the test socket.
- Remove fuse box cover. On the inner side there are fuse tongs.
- Using the tongs, pull fuse and slip into test socket. If the indicator light comes on, the fuse is in good working order. If the indicator light does not come on, renew fuse.
5.11.4 Battery care

- Clean batteries only with the plugs screwed in.
- No gasoline, benzol, kerosene or similar should be used for cleaning.
- Check battery terminal bolts and the bolts securing the ground cables to the chassis for firm seating at regular intervals.
- Lightly coat terminals with acidproof grease, particularly clamp underside. Vent holes in the plugs and/or cell ventilation hoses must not be plugged.
- No metal objects should be placed on the batteries (danger of short circuit).
- Battery visual inspections must never be performed with naked lights because the formation of oxy-hydrogen gas might create the danger of an explosion. Only use electric lights.
- The electrolyte level in each cell should be approx. 15 mm above the plate upper edge.
- Replenish only with distilled water. Water evaporates while the battery is charged during vehicle operation. No metal funnels must be used for replenishment.
- The electrolyte specific gravity gives a rough indication of the battery state of charge.
- Replace drained electrolyte by chemically pure battery acid of the like specific gravity.
- To charge, remove terminal clamps. The charging current should not exceed $\frac{1}{10}$ of the battery capacity. The battery can be considered charged as soon as all cells produce gas uniformly and vigorously.
- Only after the positive and negative cables have been removed from the terminal posts may the batteries be charged by means of a rapid charger.

**Caution!** Be sure to check the electrolyte level at least once every week in summer and in hot zones.
5.11.5 Checking the headlight setting

Correct headlight adjustment is of paramount importance to roadworthiness. Periodic checks with a headlight adjuster should therefore be made.
- Drive vehicle onto a level and horizontal surface.
- Correct tire inflation pressure (see tire pressure table - last page).
- Check each headlight individually. Cover up the other headlight and the remaining lights.

Loaded vehicle:
- The bright/dark borderline of the low beam is determined by subtracting 10 cm from the headlight horizontal centerline (distance between headlight center and ground) with a vehicle positioned in such a way that the headlights are 10 m from the aiming screen.

Unloaded vehicle: (Loaded with 1 driver or 75 kg)
- Headlight beam control to initial position.
- The bright/dark borderline of the low beam is determined by subtracting 30 cm from the headlight horizontal centerline (distance between headlight center and ground) with a vehicle positioned in such a way that the headlights are 10 m from the aiming screen.

5.11.6 Headlight bulb replacement

- Turn left and detach cap of headlight cowl.
- Disconnect electrical connector.
- Unlock bulb holder from its bayonet lock by depressing and turning it counterclockwise.
- Remove two-filament bulb with mounting flange.
- Do not touch the new bulb with moist or oily fingers but use tissue paper.
- Install the bulb in such a manner that the mounting flange guide lugs engage into the notches on the reflector neck.
- Put on bulb holder and depress and turn it clockwise for engagement.
- Connect the electrical connector.
- Position cap and fasten by turning to the right.
- Then check headlight adjustment.
5.11.7 Three-phase alternator

- The three-phase alternator must never be disconnected from the batteries while the vehicle is in operation. As long as the engine is running neither an alternator cable nor a battery terminal clamp must be loosened, removed or wrongly connected.
- Repairs and inspections on the alternator are to be performed by the skilled staff members of MERCEDES-BENZ service stations only.

5.11.8 Visual inspection of spark plugs (210 – 410)

Remove and install spark plugs (provided with sealing cone) only with combination wrench from the vehicle tools or with a recommended spark plug wrench. Observe tightening torque. Refer to section 5.1.2.
Check spark plug electrode gaps. Renew worn plugs. Refer to section 5.1.1.
5.11.9 Bulbs – summary

Always carry a set of bulbs in the vehicle for emergencies.

<table>
<thead>
<tr>
<th>Type of Light</th>
<th>Vehicle Type</th>
<th>Voltage</th>
<th>Wattage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headlights</td>
<td></td>
<td>H 4</td>
<td>12 V 60, 55 W or 12 V 45/40 W</td>
</tr>
<tr>
<td>Parking lights</td>
<td></td>
<td></td>
<td>12 V 4 W</td>
</tr>
<tr>
<td>Rear fog light, turn signals,</td>
<td></td>
<td></td>
<td>12 V 21 W</td>
</tr>
<tr>
<td>stop lights, backup light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tail lights</td>
<td>Cargo truck</td>
<td>12 V</td>
<td>10 W</td>
</tr>
<tr>
<td></td>
<td>Van</td>
<td>12 V</td>
<td>5 W</td>
</tr>
<tr>
<td>Side marker lights</td>
<td></td>
<td>12 V</td>
<td>10 W</td>
</tr>
<tr>
<td>Interior lights</td>
<td></td>
<td>12 V</td>
<td>10 W (festoons bulbs)</td>
</tr>
<tr>
<td>License plate lights</td>
<td></td>
<td>12 V</td>
<td>5 W (festoons bulbs)</td>
</tr>
<tr>
<td>Instrument lighting, indicator lights</td>
<td></td>
<td>12 V 2 W</td>
<td></td>
</tr>
<tr>
<td>Illumination of heater controls</td>
<td></td>
<td>12 V</td>
<td>30 mA (glass base lamp)</td>
</tr>
<tr>
<td>Indicator lights: hazard warning</td>
<td></td>
<td></td>
<td>12 V 1.2 W (glass base lamp)</td>
</tr>
<tr>
<td>Flasher system, rear fog light</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tachograph lighting,</td>
<td></td>
<td>12 V</td>
<td>1.2 W (glass base lamp with cap)</td>
</tr>
<tr>
<td>Maximum speed warning light</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.11.10 Wiring diagrams

Key to wiring diagram 208 D - 410 D (Items 1 to 6)

<table>
<thead>
<tr>
<th>Wire color code</th>
<th>X 2 Clamped connector, 3 wires</th>
</tr>
</thead>
<tbody>
<tr>
<td>bl = blue</td>
<td>= Cross section of wire</td>
</tr>
<tr>
<td>li = violet</td>
<td>Three-phase alternator:</td>
</tr>
<tr>
<td>br = brown</td>
<td>55A = 4 mm²</td>
</tr>
<tr>
<td>el = ivory</td>
<td>80A = 6 mm²</td>
</tr>
<tr>
<td>ge = yellow</td>
<td></td>
</tr>
<tr>
<td>gn = green</td>
<td></td>
</tr>
<tr>
<td>gr = grey</td>
<td></td>
</tr>
<tr>
<td>rs = pink</td>
<td></td>
</tr>
<tr>
<td>rt = red</td>
<td></td>
</tr>
<tr>
<td>sw = black</td>
<td></td>
</tr>
<tr>
<td>ws = white</td>
<td></td>
</tr>
<tr>
<td>el = ivory</td>
<td></td>
</tr>
<tr>
<td>ge = yellow</td>
<td></td>
</tr>
<tr>
<td>gn = green</td>
<td></td>
</tr>
<tr>
<td>gr = grey</td>
<td></td>
</tr>
</tbody>
</table>

Example:

Wire designation 1.5 gr/rt
Cross section of wire 1.5 = 1.5 mm²
Basic color gr = grey
Identification color rt = red

1 Starter control, power supply

<table>
<thead>
<tr>
<th>A 1</th>
<th>Steering lock</th>
</tr>
</thead>
<tbody>
<tr>
<td>B 1</td>
<td>Temperature sensor</td>
</tr>
<tr>
<td>G 1</td>
<td>Battery 12 V</td>
</tr>
<tr>
<td>G 2</td>
<td>Three-phase alternator</td>
</tr>
<tr>
<td>H 1</td>
<td>Charge indicator light</td>
</tr>
<tr>
<td>H 2</td>
<td>Preglowing indicator light</td>
</tr>
<tr>
<td>K 1</td>
<td>Preglowing time relay</td>
</tr>
<tr>
<td>M 1</td>
<td>Starter</td>
</tr>
<tr>
<td>R 1</td>
<td>Glow plugs</td>
</tr>
<tr>
<td>S 1</td>
<td>Battery master switch</td>
</tr>
</tbody>
</table>

2 Light switch, rear fog light, license plate light, tail light, parking light, fog lights

| E 1 | Parking light, right |
| E 2 | Tail light, right |
| E 3 | License plate light |
| E 4 | License plate light |
| E 5 | Rear fog light |
| E 10 | Fog light, left |
| E 11 | Fog light, right |
| F 1 | Fuse 5A (vehicles with fog light 10A) |
| F 9 | Fuse |
| F 10 | Fuse |
| Q 1 | Light switch |
| X 1 | Trailer plug socket |

3 Parking light, tail light, trailer plug socket

| E 6 | Parking light, left |
| E 7 | Tail light, left |
| F 5 | Fuse |
| S 2 | Combination switch |
| X 1 | Trailer plug socket |

4 Headlights

| E 8 | Headlight, left |
| E 9 | Headlight, right |
| F 11 - F 14 | Fuses |
| H 3 | High beam indicator light |

5 Operation monitoring components, hazard warning flasher system

| F 6 | Fuse |
| H 4 | Turn signal indicator light, trailer |
| H 5 | Turn signal indicator light, tractor |
| K 2 | Hazard warning flasher sending unit |
| S 2 | Combination switch |
| S 3 | Hazard warning flasher switch |

6 Turn signal lights

| H 6 | Turn signal, front, right, on side |
| H 7 | Turn signal, front, right |
| H 8 | Turn signal, rear, right |
| H 9 | Turn signal, rear, left |
| H 10 | Turn signal, front, left |
| H 11 | Turn signal, front, left, on side |
| X 1 | Trailer plug socket |
Key to wiring diagram 208 D - 410 D (Items 7 to 15)

7 Windshield wiper, windshield washer
   K 3 Switch, windshield wiper, intermittent wiping
   M 2 Windshield wiper motor
   M 3 Windshield washer motor
   S 2 Combination switch

8 Stop light
   B 2 Stop light switch
   B 3 Switch, horn
   E 12 Stop light, left
   E 13 Stop light, right
   F 4 Fuse
   H 12 Horn
   X 1 Trailer plug socket

9 Heater blower
   M 4 Heater blower motor
   S 4 Heater blower switch

10 Fuel, coolant
    B 4 Sending unit for fuel gauge
    B 5 Sending unit for coolant temperature gauge
    P 1 Fuel gauge
    P 2 Coolant temperature gauge

11 Backup light
    E 14 Backup light, left
    E 15 Backup light, right
    F 5 Fuse
    S 5 Backup light switch

12 Speedometer, tachograph, clock
    E 16 Lighting for heater control
    P 3 Speedometer
    P 4 Clock
    P 5 Tachograph

13 Door contact switch, interior lights, plug socket
    E 17 Cargo space light
    F 2 Fuse
    H 13 Interior light
    S 6 Switch, interior light
    S 7 Door contact switch
    S 8 Switch, interior light
    X 3 Plug socket cab

14 Heated rear window
    B 6 Switch for heated rear window
    H 14 Indicator light for heated rear window

15 Clearance lights, brake pad wear, brake fluid, oil pressure
    B 7 Switch, brake pad wear indicator, left
    B 8 Switch, brake pad wear indicator, right
    B 9 Switch, brake fluid
    B 10 Switch, oil pressure
    B 11 Switch, differential lock
    E 18 Clearance light, front, left
    E 19 Clearance light, front, right
    E 20 Clearance light, rear, left
    E 21 Clearance light, rear, right
    F 15 Fuse
    H 16 Indicator light, brake fluid and brake pad wear
    H 17 Indicator light, oil fluid
    H 18 Indicator light, differential lock
    V 1 Diode
    X 1 Trailer plug socket
### Key to wiring diagram 210 - 410 (Items 1 to 5) Vehicles without catalyst

**Wire color code**
- bl = blue
- li = violet
- br = brown
- rs = pink
- el = ivory
- rt = red
- ge = yellow
- sw = black
- gn = green
- ws = white
- gr = grey

**Example:**
Wire designation 1.5 gr/rt
Cross section of wire 1.5 = 1.5 mm²
Basic color gr = grey
Identification color rt = red

1. **Starter control, power supply, TDC transmitter**
   - A1 Steering lock
   - B1 TDC transmitter
   - G1 Battery 12 V
   - G2 Three-phase alternator
   - H1 Charge indicator light
   - K1 Transistorized ignition switching unit
   - L1 Ignition coil
   - M1 Starter
   - R1 Spark plugs
   - S1 Battery master switch
   - S2 Distributor
   - X1 Clamped connector 3 wires
   - X2 Diagnostic plug socket
   - *Cross section of wire of three-phase alternator:
     - 55A = 4 mm²
     - 80A = 6 mm²

2. **Light switch, rear fog light, license plate light, tail lights, parking light, fog lights, clearance lights**
   - E1 Parking light, right
   - E2 Clearance light, front, right (roof)
   - E3 Clearance light, rear, right (cargo truck)
   - E4 Tail light, right
   - E5 License plate light
   - E6 License plate light
   - E7 Fog light, left
   - E8 Fog light, right
   - E9 Rear fog light
   - E10 Parking light, right
   - E11 Clearance light, front, left (roof)
   - E12 Clearance light, rear, left (cargo truck)
   - E13 Tail light, left
   - F1 Fuse 5A (vehicles with fog light 10A)
   - F8 Fuse
   - F9 Fuse
   - F10 Fuse
   - Q1 Light switch
   - X3 Trailer plug socket

3. **Scheinwerfer**
   - E14 Headlight, left
   - E15 Headlight, right
   - F11 - F14 Fuses

4. **Turn signal lights, hazard warning flasher system, trailer plug socket**
   - F6 Fuse
   - H3 Turn signal indicator light, trailer
   - H4 Turn signal indicator light, tractor
   - H5 Turn signal, front, right, on side
   - H6 Turn signal, front, right
   - H7 Turn signal, rear, right
   - H8 Turn signal, rear, left
   - H9 Turn signal, front, left
   - H10 Turn signal, front, left, on side
   - K2 Hazard warning flasher sending unit
   - S3 Combination switch
   - S4 Hazard warning flasher switch
   - X3 Trailer plug socket

5. **Windshield wiper, windshield washer**
   - K3 Windshield wiper, intermittent wiping relay
   - M2 Windshield wiper motor
   - M3 Windshield washer motor
   - S3 Combination switch
Key to wiring diagram 210 - 410 (Items 6 to 13) Vehicles without catalyst

6 Stop light horn
- B 2 Stop light switch
- E 16 Stop light, left
- E 17 Stop light, right
- F 4 Fuse
- H 11 Horn
- S 5 Switch, horn
- X 3 Trailer plug socket

7 Heater blower
- M 4 Heater blower motor
- S 6 Heater blower switch

8 Fuel, coolant, backup light
- B 3 Sending unit for fuel gauge
- B 4 Sending unit for coolant temperature gauge
- E 18 Backup light, left
- E 19 Backup light, right
- F 5 Fuse
- P 1 Fuel gauge
- P 2 Coolant temperature gauge
- S 7 Backup light switch

9 Speedometer, tachograph, clock
- E 20 Lighting for heater control
- P 3 Speedometer
- P 4 Clock
- P 5 Tachograph

10 Door contact switch, interior lights, plug socket
- E 21, E 22 Light, cargo space
- F 2 Fuse
- H 12 Interior light
- S 8, S 9 Door contact switch
- S 10 - S 12 Switch, cargo space light
- X 4 Plug socket

11 Heated rear window, fuse test socket
- B 5 Switch for heated rear window
- H 13 Indicator light for heated rear window
- H 14 Indicator light, fuse test socket
- K 4 Relay
- R 2 Heated rear window (cargo truck)
- R 3 Heated rear window (van or cargo bus)
- X 5 Fuse test socket
- I Additional fuse

12 Brake fluid, oil pressure, choke control, brake pad wear
- F 15 Fuse
- H 15 Indicator light, brake fluid
- H 16 Indicator light, oil pressure

13 Intake manifold heater, idling speed cut-off valve
- B 6 Switch, temperature 40°C (104°F)
- F 3 Fuse
- F 7 Fuse
- K 5 Relay, intake manifold heater
- R 4 Intake manifold heater
- R 5 Thermostatic spring, automatic choke (automatoc transmission)
- Y 1 Idling speed cut-off valve
- X 3 Trailer plug socket

H 17 Indicator light, choke control (manual transmission)
H 18 Indicator light, differential lock
S 13, S 14 Switch, brake pad wear, left and right
S 15 Switch, brake fluid
S 16 Switch, oil pressure
S 17 Switch, choke control
S 18 Switch, differential lock
V 1 Diode
Key to wiring diagram 210 - 410 (Items 1 to 6) Vehicles with closed-loop system catalyst

Wire color code
- bl = blue  li = violet
- br = brown  rs = pink
- el = ivory  rt = red
- ge = yellow  sw = black
- gn = green  ws = white
- gr = grey

Example:
Wire designation 1.5 gr/rt
Cross section of wire 1.5 = 1.5 mm²
Basic color gr = grey
Identification color rt = red

1. Starter control, power supply
   A 1 Steering lock
   B 1 TDC transmitter
   G 1 Battery 12 V
   G 2 Three-phase alternator
   H 1 Charge indicator light
   K 1 Transistorized ignition switching unit
   L 1 Ignition coil
   M 1 Starter
   R 1 Spark plugs
   S 1 Battery master switch
   S 2 Distributor
   X 1 Clamped connector 3 wires
   X 2 Diagnostic plug socket
   * = Cross section of wire of three-phase alternator:
   55A = 4 mm²
   80A = 6 mm²

2. Light switch, rear fog light, license plate lights, tail lights, parking light, fog lights
   E 1 Parking light, right
   E 2 Clearance light, front, right (roof)
   E 3 Clearance light, rear, right (cargo truck)
   E 4 Tail light, right
   E 5 License plate light
   E 6 License plate light (van or cargo bus)
   E 7 Fog light, left
   E 8 Fog light, right
   E 9 Fog light, right (cargo truck)
   E 10 Parking light, left
   E 11 Clearance light, front, left (roof)
   E 12 Clearance light, rear, left (cargo truck)
   E 13 Tail light, left
   F 1 Fuse 5A (vehicles with fog light 10A)
   F 8 - F 10 Fuses
   Q 1 Light switch
   S 3 Combination switch
   X 3 Trailer plug socket

3. Headlight
   E 14 Headlight, left
   E 15 Headlight, right
   F 11 - F 14 Fuses
   H 2 High beam indicator light

4. Turn signal lights, hazard warning flasher system, trailer plug socket
   F 6 Fuse
   H 3 Turn signal indicator light, trailer
   H 4 Turn signal indicator light, tractor
   H 5 Turn signal, front, right, on side
   H 6 Turn signal, front, right
   H 7 Turn signal, rear, right
   H 8 Turn signal, rear, left
   H 9 Turn signal, front, left
   H 10 Turn signal, front, left, on side
   K 2 Hazard warning flasher sending unit
   S 3 Combination switch
   S 4 Hazard warning flasher switch
   X 3 Trailer plug socket

5. Windshield wiper, windshield washer
   K 3 Windshield wiper, intermittent wiping relay
   M 2 Windshield wiper motor
   M 3 Windshield washer motor
   S 3 Combination switch

6. Stop light, horn
   B 2 Stop light switch
   E 16 Stop light, left
   E 17 Stop light, right
   F 4 Fuse
   H 11 Horn
   S 5 Switch, horn
   X 3 Trailer plug socket
### Key to wiring diagram 210 – 410 (Items 7 to 13) Vehicles with closed-loop system catalyst

#### 7 Heater blower
- **E 18** Lighting for heater control
- **M 4** Heater blower motor
- **S 6** Heater blower switch

#### 8 Fuel, coolant, backup light
- **B 3** Sending unit for fuel gauge
- **B 4** Sending unit for coolant temperature gauge
- **E 19** Backup light, left
- **E 20** Backup light, right
- **F 5** Fuse
- **P 1** Fuel gauge
- **P 2** Coolant temperature gauge
- **S 7** Backup light switch

#### 9 Speedometer, tachograph, clock
- **P 3** Speedometer
- **P 4** Clock
- **P 5** Tachograph

#### 10 Door contact switch, interior lights, plug socket
- **E 21, E 22** Lights, cargo space
- **F 2** Fuse
- **H 12** Interior light
- **S 8, S 9** Door contact switch
- **S 11, S 12** Switch, cargo space light
- **X 4** Plug socket

#### 11 Heated rear window, fuse test socket
- **B 5** Switch for heated rear window
- **H 13** Indicator light for heated rear window
- **H 14** Indicator light, fuse test socket
- **K 4** Relay, heated rear window
- **R 2** Heated rear window (cargo truck)
- **R 3** Heated rear window (van or cargo bus)
- **X 5** Fuse test socket
- **I** Additional fuse

#### 13 Control unit
- **F 3** Fuse
- **F 7** Fuse
- **K 5** Overvoltage protection relay
- **K 6** Relay, intake pipe heater
- **K 7** Relay, bypass heater
- **N 1** Control unit
- **R 4** Temperature sensor
- **R 5** Intake pipe heater
- **R 6** Bypass heater
- **R 7** Oxygen sensor
- **R 8** Adjustment plug
- **X 6** Ground connection, engine
- **X 7** Plug connection, air conditioner
- **Y 1** Throttle valve actuator
- **Y 2** Potentiometer, throttle valve
- **Y 3** Choke adjusting motor
- **Y 4** Solenoid valve, float chamber ventilation
Key to wiring diagram of automatic transmission

B 1 Speed sensor
B 2 NTC sensor
B 3 Automatic choke heater coil
K 1 Relay 1st gear
K 2 Relay, kickdown shutoff system
N 1 Display unit
N 2 Control unit, electronic idle control
N 3 Control unit, kickdown
S 1 Micro switch, 1st gear
S 2 Starter lockout switch
S 3 Switch (kickdown)
V 1 Diode
Y 1 Operating magnet
Y 2 Solenoid valve, kickdown
I Additional fuse
a Connection of speedometer or tachograph lighting
b Connection, ground
c Plug connector I, terminal 2
d Cable harness, engine, terminal 50
e Clamped connector, 3 wires, terminal 2
f Overvoltage protection, terminal 2
g Plug connector II, terminal 5
h Diagnostic plug socket, terminal 1
i Connection, idle fuel cutoff valve
Key to wiring diagram, ABS

A1 Hydraulic unit
G1 Sensor, front axle, left
G2 Sensor, front axle, right
G3 Sensor, rear axle, left
G4 Sensor, rear axle, right
H1 Indicator light
K1 Relay
K2 Relay
K3 Overload protection
M1 Motor hydraulic pump
N1 ABS control unit
Y1 Solenoid control valve, front axle, left
Y2 Solenoid control valve, front axle, right
Y3 Solenoid control valve, rear axle, left
Y4 Solenoid control valve, rear axle, right

a Connection, charge indicator light
b Connection, stop light switch
c Clamped connector 3 wires, terminal 1
d Clamped connector 3 wires, terminal 2
e LHD-vehicles
f RHD-vehicles
SV-speed sensor 4 wires
Key to wiring diagram,
supplementary hot-water heater
208 D - 410 D

B 1 Micro switch, heater blower
H 1 Operation indicator light
K 1 Relay
K 2 Relay
K 3 Relay
K 4 Relay
M 1 Heater blower (cab)
M 2 Heater blower (cargo space)
M 3 Circulation pump
N 1 Control unit
N 2 Heater
S 1 Timer
S 2 Switch, supplementary heater
S 3 Switch, heater blower motor
V 1 Diode
V 2 Diode
Y 1 Solenoid valve
I - IV Additional fuses
  a Clamped connector 3 wires, terminals 3
  b Clamped connector 3 wires, terminals 1
  c Clamped connector 3 wires, terminals 2
  d Connection, fuel gauche illumination
  e Ground
Key to wiring diagram,
supplementary hot-air heater
208 D - 410 D

H1   Operation indicator light
M2   Supply unit
N1   Control unit
N2   Heater
S1   Switch

l   Additional fuse
a   Ground
b   Connection, fuel gauge
   illumination
   Connection, clamped connector,
   3 wires, terminal 1
Key to wiring diagram, supplementary hot-air heater 210 - 410

H 1 Operation indicator light
M  Fuel pump
M2 Supply unit
N 1 Control unit
N 2 Heater
S 1 Switch

l  Additional fuse
a  Ground
b  Connection, fuel gauge illumination
c  Connection, clamped connector, 3 wires, terminal 1
5.12 Chassis and body

5.12.1 Inspection and maintenance of trailer coupling
(Comply with manufacturer's specifications)
- Clean trailer coupling and lubricate with multipurpose grease.
- Check whether the fastening bolts which attach the trailer coupling to the frame rear cross member and the frame rear cross member to the frame are tight and retighten them if necessary.

5.12.2 Adjustment of dropside locks
- Open dropside lock.
- Turn locking bolt to the right (screwing in).
- Close dropside lock and check holding strength.
If the required strength is not attained, repeat procedure.

5.12.3 Lubrication
For lubrication use only high pressure grease guns not exceeding a maximum pressure of approx. 250 bar.
Grease guns without safety devices may damage bearings, seals, etc.
- Carefully clean lubrication nipples prior to the lubrication service.
- Depending on the operating conditions, grease steering knuckle pins and propeller shaft more frequently.
- Lubricate special bodies and equipment in compliance with manufacturer's instructions.
5.13 Vehicle cleaning and care

- Use an ample supply of water to wash the vehicle. Do not wash it in direct sunlight.
- Use dry-cleaning gasoline (not automotive fuel) to remove grease stains.
- Brush down heavily soiled aluminium dropsides with water to which a non-alkaline detergent may be added.
- For cleaning steering wheel, gearshift lever, soiled upholstery and floor covering in the cab, use only warm water with dish washing detergent or washing powder for delicate fabrics. Do not use scouring agents.
- Clean seat belt webbing with lukewarm water and soap. Do not apply any chemical cleaning agents. Do not dry the webbing at temperatures above 80°C/176°F or in direct sunlight. Never bleach or redye the webbing.
- Apply some talcum to glass channels, window weatherstrips and door rubber seals.
- Have the chassis thoroughly cleaned and inspected prior to the performance of major maintenance work.
- After cleaning the vehicle, especially if a steam cleaner or grease solvents were used, lubricate chassis according to the Maintenance Booklet.
- Brake hoses must never be painted or cleaned with gasoline, benzol, kerosene or mineral oils. Clean hoses only with water. Be sure not to apply any sprays or grease to the brake hoses when spraying or lubricating the vehicle.

All chassis components and the undersection of the driver's cab are exposed to outside influences (stones, gravel) and chemical reactions (melted snow, road salts).
- After the elimination of any (corrosion) damage, repair paintwork, PVC underseal and wax preservation. Every MERCEDES-BENZ service station will advise you accordingly.
5.14 Preparing the vehicle for storage

Storage for up to 12 month periods

Every MERCEDES-BENZ service station will offer detailed information.

- Thoroughly clean chassis, engine and engine compartment as well as inside and outside of body. If possible, park vehicle in a dry and airy garage.
- Fill up fuel tank completely.
- Grease all lubrication points in accordance with the specifications in the Maintenance Booklet.
- Increase the tire inflation pressure by approx. 2 bar above the specified level to prevent flat spots on the tires.
- Cover up tires to protect against sun's rays.
- Check coolant level and antifreeze protection. Refer to sections 3.1 and 4.2.
- Change engine oil and filter. See section 5.1.3.
  Fill with initial operation oil.
  Note: If the 500 - 1500 km/300 - 900 miles inspection has not been performed as yet, oil and filter need not be changed. Check engine oil level, refer to section 3.1.
- Slacken poly-V-belts.
- Seal air intake port, tailpipe and component breathers airtight.
- Check paintwork for damage and repair.
- Spray chassis, engine and engine compartment with preservation wax.
  if necessary, spray paintwork and chromium-plated parts with outer skin protection wax.
  Note: Only use approved brands of outer skin protection wax and preservation wax.
- Position wheel chocks to prevent the vehicle from rolling away.
- Release parking brake.
- On vehicles with manual transmission, lock clutch in declutched position.
- Detach negative battery terminals.

Regularly service batteries which are not in use.
- Coat terminal posts with acidproof grease.
- Recharge batteries once a month or charge continuously at 0.06 A.
- Discharge and recharge every 3 months.
- Check electrolyte level.

Battery life, however, is limited, no matter how well the batteries are serviced.

**Storage for more than 12 months or under difficult conditions** (e.g. in tropical countries)

Every MERCEDES-BENZ service station will readily advise you.

### 5.15 Preparing the vehicle for service after storage

Every MERCEDES-BENZ service station will provide detailed information. Before operating such a vehicle, observe the following:

- Inflate tires to specified pressure.
- Tension poly-V-belts.
- Remove clutch locking device.
- Remove all covers from air intake port, tailpipe and breathers of components.
- Check oil levels in steering gear, transmission and live axles.
- Drain oil from engine and fill engine with approved engine oil. Refer to sections 4.1 and 5.1.3.
- Use initial operation oil if the 500 - 1,500 km/300 - 900 miles inspection has not been performed yet.
- If the paintwork had been sprayed with outer skin protection wax, perform special depreservation measures.
- Check coolant level and antifreeze protection. Refer to sections 3.1 and 4.2.
- Connect batteries.
- Start engine. Check oil pressure. Inspect hoses and lines for cracks and leaks.
- Test function of electrical system, air conditioner and supplementary heater.
- Check brake efficiency.
6 Troubleshooting

The following suggestions will help you to cope with roadside failures. It is their purpose to enable you to drive your vehicle to a MERCEDES-BENZ service station where possible malfunctions will be eliminated. The following suggestions are to facilitate troubleshooting. They are not intended to substitute the work of the expert who will eventually eliminate the cause of the malfunction. These recommendations cannot be considered exhaustive.

6.1 Engine and fuel system

Engine will not start (208 D – 410 D)

Fuel tank almost or completely empty
- Fill up and bleed the system, refer to sections 3.1 and 5.2.3.

Fuel line or fuel tank strainer clogged
- Clean and bleed the system, refer to section 5.2.3.

Clogged fuel prefilter
- Renew prefilter, bleed the system, refer to sections 5.2.1 and 5.2.3.

Clogged fuel filter
- Renew filter element, bleed the system, refer to sections 5.2.2 and 5.2.3.

Fuel system leaking
- Seal the fuel lines, bleed the system, refer to section 5.2.3.

Ambient temperature below 0°C (32°F)
- Observe winter operation instructions, refer to sections 3.9 and 4.3

Fuel tank almost or completely empty
- Fill up, refer to sections 3.1 and 4.3.

Fuel pump fails to feed
- Consult workshop.

Carburetor nozzles clogged
- Consult workshop.

Ignition system faulty
- Check whether spark plug cable terminals are properly seated on spark plugs and all cables are tightly connected.
- Spark plugs – check gap and condition, refer to sections 5.1.1 and 5.11.8.

Moisture (condensate) in ignition distributor
- Check ignition distributor; wipe housing cover with dry cloth.

Engine will not start (210 – 410)
Hard starting or engine stalling
(208 D - 410 D)

- Clogged fuel filter
  - Renew the filter element, bleed the system, refer to sections 5.2.2 and 5.2.3.
- Fuel tank vent restricted
  - Clean.
- Overflow valve in the injection pump does not hold the developed pressure
  - Consult workshop.

Fuel tank vent restricted
- Clean.

Engine oil pressure warning light comes on

- Check engine oil level, see section 3.1
- Too little oil in the oil pan:
  - Top up, see sections 4.2 and 4.4.
- Oil level correct
  - Caution! Do not run engine. Consult workshop.
  - For towing vehicle, see section 6.10.

Lack of power
(208 D - 410 D)

- Lack of fuel
  - Renew filter element, bleed the system, refer to sections 5.2.2 and 5.2.3.
- Full-load stop is not reached
  - Consult workshop.
- Insufficient air supplied at high engine speeds
  - Service or renew air cleaner element, refer to section 5.1.4.

Engine overheats

- Not enough coolant in the cooling system
  - Add coolant, check system for leaks, refer to sections 3.1 and 4.2.
- Faulty thermostat
  - Replace thermostat.
- Poly-V-belt broken
  - Renew poly-V-belt, consult workshop.
- Cooling system clogged
  - Consult workshop.
- Exterior of radiator soiled
  - Clean exterior of radiator, refer to section 5.3.1.
- Fluid coupling of fan defective
  - Lock fluid coupling, renew fan after a maximum of 1 000 km (600 miles), refer to section 6.9.
6.2 Clutch

Clutch slips

- Clutch facings worn or covered with grease or oil
  - Consult workshop.

Clutch dragging

- Air in the hydraulic system
  - Check system for leaks, replenish, refer to sections 3.1 and 4.4.

Engine cannot be shut off
(208 D – 410 D)

- Vacuum system faulty
  - Shut off engine by hand, refer to section 6.8.

Black exhaust smoke
(208 D – 410 D)

- Air cleaner element obstructed
  - Clean or renew, refer to section 5.1.4.

- Faulty injection nozzles
  - Consult workshop.

- Start of delivery wrongly adjusted
  - Consult workshop.

- Excessive quantity of fuel injected
  - Consult workshop.

Clutch slipping
Clutch dragging
6.3 Steering

Hard steering (manual steering)
- Steering knuckles not lubricated
  - Lubricate.
- No fluid in steering gear
  - Check steering gear for leaks, add fluid, refer to sections 4.4 and 5.8.3.

Hard steering (power steering)
- Low fluid level in the system
  - Check system for leaks, add fluid, refer to sections 4.4 and 5.8.3.
- Poly-V-belt broken
  - Renew poly-V-belt, consult workshop.

Power steering rattles when being turned
- Air in the hydraulic system
  - Check system for leaks, add fluid, refer to sections 4.4 and 5.8.3.

Poor centering
- Steering knuckles not lubricated
  - Lubricate.
- Excessive free play
  - Consult workshop.
- Tires underinflated
  - Inflate to correct pressure.
- Incorrect toe-in
  - Correct, refer to section 5.8.4.
- Wrongly adjusted front wheel bearings
  - Consult workshop.
- Low fluid level in the system
  - Check system for leaks, add fluid, refer to sections 4.4 and 5.8.3.
- Air in the hydraulic system
  - Check system for leaks, add fluid, refer to sections 4.4 and 5.8.3.
## 6.4 Brake system

<table>
<thead>
<tr>
<th>Condition</th>
<th>Action</th>
</tr>
</thead>
</table>
| "Brake fluid" indicator light comes on during operation | Caution! Stop immediately  
- Diagnose cause, refer to section 3.6. |
| "Brake fluid" indicator light comes on while braking | Brake pads are worn  
- Have brake pads renewed, consult workshop. |
| Uneven braking action |  
- Exchange, refer to section 5.9.3.  
- Inflate to correct pressure.  
- Worn or oily brake pads/linings  
  - Reline brakes, consult workshop.  
- Faulty hydraulic system  
  - Consult workshop. |
| No or insufficient braking action | Vacuum brake booster defective  
- Consult workshop.  
- Too little brake fluid in hydraulic system  
  - Check hydraulic system for leaks, consult workshop.  
- Air in hydraulic system  
  - Consult workshop.  
- Worn lining, grease on lining  
  - Reline, consult workshop. |
| Hand brake not releasing | Hand brake cable stuck  
- Consult workshop. |
### 6.5 Electrical system

#### Starter will not crank the engine
- Battery flat or defective
  - Recharge or replace, refer to section 5.11.4.
- Battery terminals loose or corroded
  - Clean terminals, coat with acidproof grease, tighten firmly, refer to section 5.11.4.
- Cable loose or faulty
  - Tighten or replace.
- Starter defective
  - Consult workshop.

#### Generator charging control light will not come on (with engine shut off)
- Burnt-out bulb
  - Replace.
- Open circuits in wiring
  - Tighten connections or replace wiring.

#### Generator charging control light remains on (with the engine running)
- Regulator or alternator faulty
  - Consult workshop.
- Poly-V-belt broken
  - Renew poly-V-belt, consult workshop.

#### Preglow indicator light will not come on (208 D - 410 D)
- Burnt-out bulb
  - Replace.
- Open circuits in wiring
  - Tighten connections or replace wiring.
- Preglow time relay defective
  - Renew preglow time relay, consult workshop.
- Glow plug(s) faulty
  - Replace glow plug(s), consult workshop.
- Battery discharged or damaged
  - Recharge or renew, refer to section 5.11.4.
6.6 Supplementary heater

Heater motor will not start

- Battery discharged or damaged
  - Recharge or renew, refer to section 5.11.4.
- Fuse defective
  - Renew fuse.
- Commutator or carbon brushes worn
  - Consult workshop.

Heater will not ignite, control unit shuts off automatically

- Fuel tank almost empty
  - Refuel, switch on supplementary heater approx. 3 times.
- Ambient temperature below 0°C (32°F)
  - Comply with measures required for winter operation, refer to section 3.9.
- Fuel pump will not feed
  - Consult workshop.

Supplementary hot-water heater:
- Glow plug faulty
  - Consult workshop.
6.7 Jump starting

If the battery is flat, the engine can be started with jumper cables (minimum lead cross section is 25 mm²) and the (12 V) battery of another vehicle. Proceed as follows:
- Turn key in steering lock to position “0”.
- Run engine of jumper vehicle at high idle.
- First connect jumper cables to the positive battery terminals and then to the negative terminals.
- Start engine as normal. Refer to section 3.2.
- After the engine has started, first remove jumper cable from the negative battery terminals and then from the positive terminals.

Notes:
- Only use slave cables with insulated terminal clamps.
- A flat battery can freeze at approx. -10°C. In all cases, it must be thawed out before jumper leads are used.
- Never lean over batteries while jump starting; you might get burnt.
- 210 - 410
Vehicles with catalyst:
Only jump start when the engine is cold and the catalyst is cooled down. Should the engine fail to start within a few seconds, discontinue starting attempt. Avoid repeated starting attempts. Consult workshop.

6.8 Shutting off the engine when the vacuum system is faulty

Open engine cover and push down stop lever on injection pump until the engine stops.
6.9 Fan with fluid coupling

If the fluid coupling fails, rigidly connect the fan with the pulley.

**Caution!** Do not crank the engine by grabbing the fan.

- Place the sheet tabs opposite to the pulley recesses. Bend some of the sheet tabs in the recesses (e.g. with a screwdriver).

Have fluid coupling replaced at a MERCEDES-BENZ service station as soon as possible (max. 1 000 km/600 miles).
6.10 Tow-starting and towing the vehicle

For towing, leave engine running, if possible, to allow the power steering to become effective and to supply vacuum to the brake system.

A bogged down vehicle whose driving wheels have dug into soft or muddy ground, should be towed out with utmost care, especially when the vehicle is loaded.

The vehicle must not be pulled out jerkily or at an angle - especially sideways - because the chassis of the vehicle might be damaged. Never pull out a vehicle together with the trailer.

A useful piece of advice: using the rear coupling jaw, pull the vehicle out backward along its original track, if possible.

Towing

In case of engine damage

Vehicles with manual transmission:

- Towing distance up to 100 km (60 miles).
  - Shift transmission to neutral.
  - There are no restrictions for towing the vehicle.

- Towing distance more than 100 km (60 miles)
  - Remove propeller shaft to the live axle.

Vehicles with automatic MB transmission:

- Towing distance up to 50 km (30 miles).
  - Move transmission selector lever to position „N“.
  - Do not exceed a towing speed of 40 km/h (25 mph).

For a towing distance of more than 50 km (30 miles).
  - Remove propeller shaft to the live axle.
In case of transmission damage
- Remove propeller shaft to the live axle.

In case of front axle damage
- Lift front axle.

In case of rear axle damage
- Lift rear axle.

Tow-starting 208 D – 410 D
- Tow-start the vehicle only with the batteries connected.

Vehicles with manual transmission:
- Insert key in steering lock and turn to driving position.
  The preglow indicator light must go out.
- Declutch, engage 2nd or 3rd gear, tow-start vehicle, engage clutch slowly and actuate accelerator until the engine starts firing.

Vehicles with automatic MB transmission:
- Insert key in steering lock and turn to the driving position.
  The preglow indicator light must go out.
- Move selector lever to transmission neutral (position „N“).
- Tow-start engine. Maintain a towing speed of 25 km/h (15 mph) with a cold transmission and 40 km/h (25 mph) with a warmed up transmission to ensure sufficient fluid pressure in the transmission.
- Move selector lever to position „2“.
- Actuate accelerator only after the engine is driven by the transmission.
- If the engine starts firing, return selector lever to the neutral position immediately (position „N“).

Caution! Should the engine fail to fire within a few seconds, shift to neutral again and repeat tow-starting action.
Tow-starting 210 – 410

- Tow-start the vehicle only with the batteries connected.
- Tow-start vehicles equipped with catalyst only with engine cold and the catalyst cooled down.

Vehicles with manual transmission:
- Insert key in steering lock and turn to driving position.
- With the engine cold, pull out choke control completely.
- Declutch, engage 2nd or 3rd gear, tow-start vehicle, engage clutch slowly and actuate accelerator until the engine starts firing.

Vehicles with automatic MB transmission:
- Insert key in steering lock and turn to the driving position.
- Move selector lever to transmission neutral (position „N“).
- If the engine is cold, depress the accelerator completely once and release.
- Maintain a towing speed of 25 km/h (15 mph) with a cold transmission and 40 km/h (25 mph) with a warmed up transmission to ensure sufficient fluid pressure in the transmission.
- Move selector lever to position „2“.
- Actuate accelerator only after the engine is driven by the transmission.
- If the engine starts firing, return selector lever to the neutral position immediately (position „N“).

Notes:
- Should the engine fail to fire within a few seconds, shift to neutral again and repeat tow-starting action.
- Vehicles equipped with catalyst:
  Should the engine fail to start within a few seconds, discontinue tow-starting. Do not attempt tow-starting repeatedly. Consult workshop.
## Tire pressure chart

Tire pressure in bar

<table>
<thead>
<tr>
<th>Tires</th>
<th>PR</th>
<th>Front axle Axle loads in kg (refer to identification plate)</th>
<th>Rear axle Axle loads in kg (refer to identification plate)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1 350 1 500 1 700</td>
<td>1 400 1 500 1 680 2 030 2 210 3 200</td>
</tr>
<tr>
<td>175 R 14 C/N 6</td>
<td></td>
<td>3.75 - - -</td>
<td>4.0 - - -</td>
</tr>
<tr>
<td>175 R 14 C/N 8</td>
<td></td>
<td>- 4.5 - -</td>
<td>- 4.5 - -</td>
</tr>
<tr>
<td>185 R 14 C/N 6</td>
<td></td>
<td>- 3.75 -</td>
<td>- 3.75 -</td>
</tr>
<tr>
<td>185 R 14 C/N 8</td>
<td></td>
<td>3.25 4.0 4.5</td>
<td>3.75 4.0 4.5</td>
</tr>
<tr>
<td>205 R 14 C/N 8</td>
<td></td>
<td>2.75 3.0 -</td>
<td>- - 4.5</td>
</tr>
<tr>
<td>215 R 14 C/N 8</td>
<td></td>
<td>2.75 2.75 -</td>
<td>3.25 3.25 3.25 4.0 4.5</td>
</tr>
</tbody>
</table>

Top speed for summer and winter tires is 140 km/h (87 mph)

Your MERCEDES-BENZ service station will give you more information on winter tires.

**Caution!**
The tire inflation pressure changes by approx. 0.1 bar whenever the ambient air temperature changes by 10°C (18°F). This must be kept in mind when checking the inflation pressure in a room of different ambient temperature, particularly during the cold season.

**Example:**
- Room temperature = approx. 20°C (68°F)
- Outside temperature = approx. 0°C (32°F)
- Inflation pressure to be set = specified tire pressure + 0.2 bar.