

# 4R/6R 1000 EU Stage IV/US TIER 4

Operating Instructions



*Power. Passion. Partnership.*

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Mercedes-Benz Service Centres:

- have special equipment and tools as well as specialists who receive continuous training
- guarantee that your engine system is repaired and maintained thoroughly and expertly
- carry out all repairs related to implied warranty
- carry out all maintenance work expertly
- confirm in the Maintenance Booklet that the maintenance work has been carried out at the required time
- handle implied warranty claims that are admissible according to the sales contract

Please observe the instructions and recommendations as well as the maintenance services in the Maintenance Booklet. Please observe these instructions even if you let a third party use and care for your vehicle/device. This is the only way to ensure that you do not lose your entitlements.

If the prescribed maintenance work is not carried out, claims can only be decided after the manufacturer has inspected the claim.

During the implied warranty period, have the prescribed maintenance service for your engine system carried out as follows:

- regularly
  - punctually
  - at a qualified specialist workshop which has the necessary specialist knowledge and tools to carry out the work required
- Mercedes-Benz recommends that you use a Mercedes-Benz Service Centre for this purpose. In particular, work relevant to safety or on safety-related systems must be carried out at a qualified specialist workshop.

If there are legal requirements on emission control, please note that:

- maintenance on the engines must be carried out according to specific regulations and using special measuring devices
- it is prohibited to modify or tamper with components relevant to emissions

All Mercedes-Benz Service Centres are familiar with the relevant regulations.

Maintenance work does not include repair work. Issue a separate order for repair work. You can obtain further information on the maintenance of your engine system from any Mercedes-Benz Service Centre.

### Stored data

Several of the electronic components in your engine system contain data memories.

These data memories temporarily or permanently store technical information about:

- the engine system state
- events
- malfunctions

In general, this technical information documents the state of a component, a module, a system or the surroundings.

This includes, for example:

- operating conditions of system components, e.g. fluid levels
- status messages for the vehicle/equipment and its individual components, e.g. speed, deceleration in movement, accelerator position
- malfunctions and defects in important system components
- the reactions and operating statuses of the vehicle/equipment in special driving situations
- ambient conditions, e.g. outside temperature

### Engine management control module (MCM)

The engine management control module (MCM) is located on the side of the engine. It acts as an interface between the electric and electronic components on the engine/equipment and the drive control system unit (CPC) on the vehicle.

The engine management control module (MCM) has many functions:

- Injection control of the Common Rail diesel injection system

The engine management control module (MCM) calculates the optimum start and quantity of injection, taking the torque demand from the drive control system unit (CPC) into account.

All of the data required for this, e.g. power output or data which serve to protect the engine, are stored in the engine management control module (MCM).

- Regulation of exhaust gas recirculation (EGR)

The ratio between the mass of recirculated exhaust gas and the fresh air mass is precisely regulated over the entire engine speed range.

- Charge-air pressure control
- Control of the engine brake

The engine management control module (MCM) controls the engine brake as required by the drive control system unit (CPC).

- Fan regulation

In optional fan regulation, the solenoid valve on the fan clutch is activated according to coolant temperature.

- Instrument cluster display

The engine management control module (MCM) detects the oil level, engine oil temperature, oil pressure, coolant temperature and the engine speed for the displays in the instrument cluster.

### Drive control system unit (CPC)

The drive control system unit (CPC) is installed in a protected location in the vehicle/equipment by the vehicle/equipment manufacturer. It acts as an interface between the electric and electronic components on the vehicle/equipment and the engine management control module (MCM) on the engine.

The drive control system unit (CPC) has many functions:

- Calculation of torque demand

The drive control system unit (CPC) registers the driver's requirements. For example, the position of the accelerator is detected by the drive control system unit (CPC). A torque requirement is calculated from that and sent to the engine management control module (MCM) via the CAN connection.

In doing so, information and limitations from optionally connected control units such as the gearbox control, retarder control, ABS and ASR are taken into account.







- Output of displays and indicator signals which are displayed in the instrument cluster.
- Monitoring of coolant level, charge current and air filter, for example
- Legal speed limitation
- Evaluation of start request

The engine starting process is initiated once a corresponding start request is present (ignition lock or external engine start/ engine stop button).

### Exhaust gas aftertreatment control unit (ACM)

The exhaust gas aftertreatment control unit (ACM) is installed in a protected location in the vehicle/equipment by the vehicle/equipment manufacturer. It regulates and controls the exhaust gas aftertreatment system.

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Problem	Possible causes/consequences and ► Solutions
The  and  indicator lamps are flashing and  lights up.	<p>You have not rectified an emissions-relevant malfunction that has been detected in the exhaust gas aftertreatment system or in the AdBlue®/DEF supply.</p> <p>Reduced engine output and engine speed limitation are active. The engine torque is limited to a maximum of 20% across the whole engine speed range. The engine speed is limited to idling speed.</p> <ul style="list-style-type: none"> <li>► Adapt your driving/operating style.</li> <li>► Have the malfunction rectified immediately at a specialist workshop.</li> </ul>
The  ,  and  indicator lamps are flashing.	<p>You have not rectified an emissions-relevant malfunction that has been detected in the exhaust gas aftertreatment system or in the AdBlue®/DEF supply.</p> <p>Reduced engine output is active. The engine torque is limited to a maximum of 20% across the whole engine speed range. The engine speed is limited to idling speed.</p> <ul style="list-style-type: none"> <li>► Stop the vehicle/equipment, paying attention to road and traffic conditions.</li> <li>► Have the malfunction rectified immediately at a specialist workshop.</li> </ul>

When the AdBlue®/DEF tank is filled or the fault is rectified, full engine power will be available again. If the system check does not detect any other faults, the indicator lamps go out after the system's status indicator. The system check may involve several engine starts, several hours or several journeys without a malfunction.

### Only vehicles/equipment without the AdBlue®/DEF reserve warning light

If a malfunction is detected and the listed indicator lamps light up, a warning buzzer sounds for approximately 5 seconds. In emergencies, operating restrictions (engine torque and engine speed restrictions) can be temporarily overridden with the emergency switch (► page 34).

When working on the vehicle, comply with all safety regulations, such as operating instructions, regulations concerning hazardous materials, environmental protection measures, work safety and accident prevention regulations.


## Service products

### Important safety notes

#### WARNING

Service product can be poisonous and hazardous to health. There is a risk of injury.

Observe the instructions on the respective original container when using, storing and disposing off service products. Always store service products in the sealed original container. Always keep service products out of the reach of children.

-  Special additives (except approved fuel additives) are neither required nor approved for use with approved service products. Additives may cause damage to major assemblies. Therefore, do not mix any additives with service products. You are responsible for the results of using fuel additives.

#### Environmental note

Dispose of service products in an environmentally-responsible manner.

Service products are:



- fuels (e.g. diesel)
- lubricants (e.g. engine oil, transmission oil, grease)
- coolant, antifreeze
- AdBlue®/DEF, reducing agent in the exhaust gas aftertreatment system

Approved service products fulfil the highest quality standards and are documented in the Mercedes-Benz Specifications for Service Products. For this reason, only use approved service products for your engine system.

Information about approved service products is available from any MTU or MTU-authorized Mercedes-Benz Service Centre (▷ page 10). You can recognise service products approved by Mercedes-Benz by the following inscription on the container:


- MB-Freigabe (e.g. MB-Freigabe 228.51)  
or
- MB-Approval (z. B. MB-Approval 228.51)

Other labels and recommendations relating to the quality or indicating that the product meets a certain specification are not necessarily approved by Mercedes-Benz. Further information is available from any MTU or MTU-authorized Mercedes-Benz Service Centre (▷ page 10).

-  Information about service products which have been tested by Mercedes-Benz and approved for your engine system can be found in the Mercedes-Benz Specifications for Service products on the Internet at: <http://bevo.mercedes-benz.com/>.
-  The specification and availability of lubricants may vary. Individual lubricants may no longer be available, especially for older engines. Information is available from any MTU or MTU-authorized Mercedes-Benz Service Centre (▷ page 10).

## Engine oils

### Notes on engine oils

-  Engine oils other than those of the quality specified in this Operator's Manual are not permitted.

Only use engine oils in accordance with Sheet No. 228.51, 228.31, 228.5 or 228.3 of the Mercedes-Benz Specifications for Service Products.

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Problem	Possible causes/consequences and ► Solutions
	<p>The turbine or compressor wheel is scraping the housing; there are foreign objects in the compressor or turbine housing; bearings have seized on the rotating parts.</p> <p>► Have the exhaust gas turbocharger checked at a qualified specialist workshop.</p>
	<p>The valve clearance is excessive.</p> <p>► Check and adjust the valve clearance.</p>
	<p>The poly-V-belt is slipping.</p> <p>► Check that the poly-V-belt contact surfaces are not torn, damaged, oily or glazed. Replace the poly-V-belt if necessary.</p>

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