

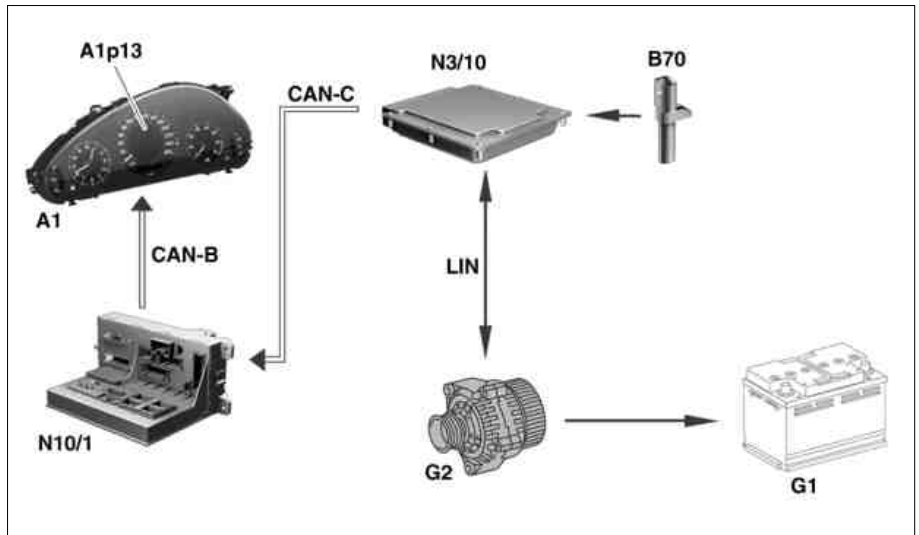
- ENGINE 266 in MODEL 169, 245 up to Model Year 2008 / YoM 07**
valid with engine control unit variant SIM 266 only
- ENGINE 272 in MODEL 164, 171, 203, 221, 230, 251 up to Model Year 2008 / YoM 07**
valid with engine control unit variant ME 9.7 only
- ENGINE 273 in MODEL 221, 230 up to Model Year 2008 / YoM 07**
valid with engine control unit variant ME 9.7 only
- ENGINE 275 in MODEL 216, 221, 230 up to Model Year 2008 / YoM 07**
valid with engine control unit variant ME 2.7.2 only
- ENGINE 629 in MODEL 164, 221 up to Model Year 2008 / YoM 07**
valid with engine control unit variant CDI 5 only
- ENGINE 640 in MODEL 169, 245 up to Model Year 2008 / YoM 07**
valid with engine control unit variant CDI A only
- ENGINE 642 in MODEL 164, 203, 221, 251 up to Model Year 2008 / YoM 07**
valid with engine control unit variant CDI 4 only
- ENGINE 646 in MODEL 211**
only valid with engine control unit variant CDI D
- ENGINE 642 in MODEL 463 up to 31.5.12**
only valid with engine control unit variant CDI 4
- ENGINE 272 in MODEL 209, 211, 219**
valid with engine control unit variant ME 9.7 only
- ENGINE 273 in MODEL 211, 219**
valid with engine control unit variant ME 9.7 only
- ENGINE 629 in MODEL 211**
valid with engine control unit variant CDI 5 only
- ENGINE 642 in MODEL 209, 211, 219**
valid with engine control unit variant CDI 4 only

Shown on model 211 with engine 272

Networking

- A1 Instrument cluster
- A1p13 Multifunction display
- B70 Crankshaft Hall sensor
- G1 Battery
- G2 Generator
- N3/10 ME-SFI [ME] control unit
- N10/1 Driver-side SAM control unit with fuse and relay module

- CAN-B Controller Area Network bus, class B (interior compartment) (CAN B)
- CAN-C Controller Area Network, bus Class C (engine compartment) (CAN-C)
- LIN Local interconnect network



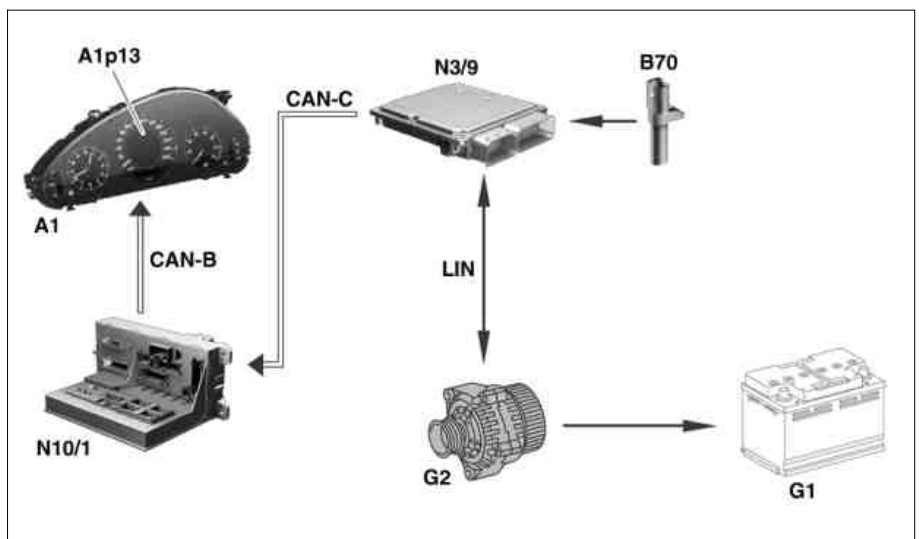
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Shown on model 211 with engine 642

Networking

- A1 Instrument cluster
- A1p13 Multifunction display
- G1 Battery
- G2 Generator
- B70 Crankshaft Hall sensor
- N3/9 CDI control unit
- N10/1 Driver-side SAM control unit with fuse and relay module

- CAN-B Controller Area Network bus, class B (interior compartment) (CAN B)
- CAN-C Controller Area Network, bus Class C (engine compartment) (CAN-C)
- LIN Local interconnect network



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General

Function and task

When the engine is running, the alternator supplies the on-board electrical system with electrical energy and charges the battery. For this purpose, the alternator generates three-phase current which is rectified. A local interconnect network is used as the alternator interface between the engine control unit and the alternator. The LIN bus is a bidirectional single-wire interface with a maximum transfer rate of 20 kbit/s.

The alternator constantly performs self-diagnosis and sends the results when requested to the engine control unit. The engine control unit compares them with other signals (e.g. engine speed, battery voltage and time after engine start) and detects the following faults:

- Electrical and mechanical faults at the alternator (regulator or diodes defective, stator interruption or short circuit, exciter interruption, regulation voltage and charging current may not be achieved, regulation voltage too high, cracked or loose poly-V belt).
 - Line for the alternator interface interrupted between engine control unit and alternator. With this fault, the alternator operates using its fixed parameters. A regulation voltage of approx. 14.3 V is predefined.
 - Short circuit or open circuit at output terminal 61 of engine control unit.
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Engine speed

Pulses from the Hall sensor or position sensor to the crankshaft are read in by the engine control unit.

The engine control unit sends the motor speed (in rpm) message to the Controller Area Network bus Class C.

Diagnosis

The following faults are detected after "ignition ON" and may be stored as a fault entry in the engine control unit:

- Alternator interface defective
 - Line interruption (circuit 30)
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The "battery symbol" and the "Visit workshop" message also appear in the multifunction display in the instrument cluster.

This fault message in the multifunction display in the instrument cluster can also be triggered by information from the following control units:

- Battery control module
- EIS [EZS] control unit

i Test prerequisites for the alternator test are listed in the diagnosis assistance system (DAS) and must always be observed. The test itself is a test routine and is menu-assisted.

Emergency running

If communication between the alternator and engine control unit is interrupted, the alternator continues to run at its fixed default parameters during normal engine operation

Messages between the engine control unit and the alternator are exchanged via the alternator interface. This follows the master-slave principle. The engine control unit is the master and the alternator acts as the slave. The alternator only sends when it is requested to do so by the master. The following tasks are performed:

- Switching on of the alternator after the engine has been started, and regulation of the alternator according to the information stored in the engine control unit. To do this, the control voltage is preset by the engine control unit.
 - Delayed adaptation of the regulation voltage in the case of a major change in alternator load.
 - Protecting the alternator against overheating.
 - Generation of terminal 61 (information "alternator is turning") in the engine control unit.
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Networking

The engine control unit uses the alternator interface to control the control response of the alternator in order to reduce, in idle, the generator torque which is produced at a high power output. As a result of the reduced engine load, less fuel is injected and the exhaust characteristics are optimized.

Terminal 61 in the engine control unit is simulated using information which the engine control unit receives via the alternator interface. This information is supplied to the driver-side SAM control unit with fuse and relay module via Controller Area Network bus class C or via a signal line.

The driver-side SAM control unit with fuse and relay module conditions the signal and makes it available to the instrument cluster via Controller Area Network bus class B.

i The upper limit value of the regulation voltage can be up to approx. 15 V.

The following faults are detected after "Engine start" and may be stored as a fault entry in the engine control unit:

- Electrical fault at alternator
 - Mechanical fault at alternator
 - Line interruption (circuit 30)
 - Undervoltage and defective alternator interface.
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Emergency start

The alternator has an emergency start function. If the communication between the alternator and engine control unit is interrupted, the alternator can build up a voltage via the residual magnetism depending on the rotational speed. If, on the basis of the voltage and frequency, the regulator detects that the alternator is rotating, it automatically begins energization of the field and enters regulation mode.

Limitations:

- The command "Regulation Off" from the engine control unit interrupts this limp-home.
- Precise specification of the starting speed for the emergency start function is not possible.

<p>On-board electrical system power supply Location of components</p>	<p>Engine 272 in model 171, 203, 209, 211, 219, 221, 230 only valid with engine control unit variant ME 9.7 Engine 273 in model 211, 219, 221, 230 only valid with engine control unit variant ME 9.7 Engine 275 in model 216, 221, 230 only valid with engine control unit variants ME 2.7.1, ME 2.7.2 Engine 629 in model 211, 221 valid with engine control unit variant CDI 5 only Engine 642 in model 203, 209, 211, 219, 221 only valid with engine control unit variants CDI 4 Engine 646 in model 211, only valid with engine control unit variant CDI D Engine 272 in model 164, 251 valid with engine control unit variant ME 9.7 only Engine 629 in model 164, only valid with engine control unit variant CDI 5 Engine 642 in model 164, 251 only valid with engine control unit variant CDI 4 Engine 642 in model 463, valid with engine control unit variant CDI 4 only Engine 266 in model 169, 245 only valid with engine control unit variant SIM 266 Engine 640 in model 169, 245 only valid with engine control unit variant CDI A</p>	<p>GF15.40-P-0001-02AA</p> <p>GF15.40-P-0001-02AB</p> <p>GF15.40-P-0001-02AC</p>
	<p>Component description for the alternator</p>	<p>GF15.40-P-2000A</p>