Introductory information on the new start of a model series GLC F-Cell

Model 253

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Model 253.99
with code 9O1 (Fuel cell pre-installation)

Preface

This introductory information presents the technical highlights of the new GLC F-CELL Type 253. In particular, it is intended to provide information in the areas of service, maintenance/repair, and Aftersales. The reader should be familiar with Mercedes-Benz model series currently on the market.

The content-related focus of this introduction information lies in the presentation of new and changed major assemblies and systems.

This introductory information is not intended as a basis for repairs or for the diagnosis of technical problems. Further information for this purpose is available in the Workshop Information System (WIS). This is being updated continuously. The information stored there always corresponds to the state of the art of the vehicles.

The introductory information provides initial information about the new GLC F-CELL Type 253. The content of the introduction information is not subject to the Update Service. Supplements are not envisaged.

Modifications and new features are published in the corresponding literature types in the WIS.

The information in this introductory information corresponds to the status as of the copy deadline in August 2018. It may thus deviate from the actual series production configuration.

Introduction

Fuel cell technology is an integral part of Daimler's drive strategy. Why? Because the advantages are clear: long range and short fueling times, coupled with wide-ranging possible uses of cars and city buses. In 2018, a new vehicle generation will start on the basis of the Mercedes-Benz GLC, the GLC F-CELL Type 253. Mercedes-Benz and the partners of the Daimler expertise network have together developed a compact new fuel cell system, the first to fit into conventional engine compartments. Two carbon-fiber-reinforced hydrogen tanks installed in the vehicle floor hold 4.4 kg of hydrogen. Thanks to the globally standardized 700-bar tank technology, the GLC F-CELL Type 253 fills up with the entire quantity within only three minutes at a hydrogen filling station. As such, the duration of a fueling process does not differ from that of a vehicle with an internal combustion engine.

The use of a lithium-ion battery is an additional new feature in a vehicle with a fuel cell. The powerful high-voltage battery has a gross capacity of around 13.3 kWh and is accommodated in the rear area of the GLC F-CELL Type 253. The high-voltage battery allows the GLC F-CELL Type 253 to drive up to 50 km with battery power alone. It can be charged on a standard household socket, a Mercedes-Benz Wallbox or a public charging station.

The combination of fuel cell and plug-in battery is the perfect response to the gradual expansion of the infrastructure of the hydrogen filling stations. The innovative plug-in fuel cell drive combines the advantages of both emission-free technologies. The anticipatory operating-mode strategy facilitates optimum usage of both energy sources in any driving condition. For example, the system has a recuperation function that makes it possible to recuperate energy during braking and coasting and to store it in the high-voltage battery. All in all, the GLC F-CELL Type 253 achieves a combined range of around 470 km (NEDC).

SN00.00-P-3003-01D	Model survey		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Model overview

Model	Vehicle	Market launch	Motor	Output [kW]	Torque [Nm]	Automatic transmission
GLC F-CELL	253.992	10/2018	780.996	155	365	725.058
GLC F-CELL	253.993	06/2019	780.996	155	365	725.058

SN00.00-P-0001-02D	Overall vehicle		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Exterior

The new GLC F-CELL type 253 is largely based on the current Mercedes-Benz design vocabulary. Among its design premises are measures that particularly emphasize its special status in general and within the GLC family with internal combustion engines.

These design premises are the formal on-road form and the technical changes in the exterior and interior as well as the operating and display concept:

- Cooler trim with hybrid blue elements and decorative inlay "F-CELL".
- New bumper at front with large air inlet grilles and with re-designed "Spectacle" bumper look galvanized in "silver shadow".
- New bumper at rear with hybrid-blue inlay beneath the loading edge and black bottom part with large-surface decorative element in silver-chromium without tailpipe covers.
- Aerodynamically designed, 20-inch light metal wheels as standard equipment with hybrid blue rim flange.
- New longitudinal member panel with hybrid blue trim insert and, in that, trim insert "F-Cell" in silver-chrome beneath the rear door.
- An "EQ Power" badge on each of the fenders.
- "F-Cell" foil on both sides running from the front fender to the rear door beneath the light edges.

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Front right side view of GLC F-CELL Type 253

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Front left side view of GLC F-CELL Type 253

P00.00-6019-79

Rear right rear view of GLC F-CELL Type 253

Interior

The vehicle interior of the GLC F-CELL Type 253 combines a sporty-looking interior with outstandingly high value appeal and flowing forms as a new interpretation of modern luxury. Precisely designed details ensure a sporty interior.

Main features of the vehicle interior design:

- Partitioning of the instrument panel by means of a trim element into an upper and lower segment.
- Clear upgrading of the instrument panel by means of high-quality trim seams in both the upper segment as well as in the door center panel and on the beltlines.
- Center console in different surfaces with trim elements in "silver shadow".
- The integrated control and display concept as part of the Mercedes-Benz operating philosophy.
- Easily legible color displays with 12.3-inch display diagonal (instrument cluster) and 10.25-inch display diagonal (central display).
- Newly introduced displays in tube optics for the instrument cluster.
- Sportily designed seats in "Cobra optics"

Interior leather black, GLC F-CELL Type 253

P68.00-8801-76

Interior leather black, GLC F-CELL Type 253

P68.00-8802-76

SN00.00-P-0080-08D	Maintenance strategy		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Maintenance strategy

Just like Type 205, the new GLC F-CELL Type 253 is subject to maintenance in accordance with the new maintenance logic. The maintenance scopes, in particular of service A and service B, were recompiled according to process-related and vehicle-related criteria. The annual maintenance cost fluctuations are thus significantly reduced.

The fixed AMG maintenance interval of 25,000 km (15,500 miles) or 12 months (Economic Commission for Europe (ECE)) and possible country-specific deviating kilometer intervals are retained however. In addition, Service A and Service B still apply alternately.

The vehicle-specific additional maintenance work is subject to the following intervals:

- Replace the cartridge of the ion exchanger - every time the vehicle is serviced
- Replace air filter element - every 75,000 km (46,500 mi) / 3 years
- Check hydrogen sensors are in operation - every 75,000 km (46,500 mi) / annually
- Replace coolant (main circuit, low-temperature circuit, high-voltage battery circuit) - every 200,000 km (124,000 mi) / 10 years

The additional maintenance intervals are retained.

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There is only one service contract that contains everything (maintenance, tires, etc.)

SN00.10-P-0010-02D	Technical data		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Dimensional drawing

The new GLC F-CELL Type 253 differs from the current basic vehicle GLC Type 253 in that it is longer.

The vehicle is not as high as a GLC Type 253 with a roof railing.

The larger track width on the front and rear axle contribute to the higher ride comfort.

Feature	Dimension (depending on model and equipment)
Vehicle data	
Curb weight DIN	2049 kg
Curb weight EG	2124 kg
Payload (EG)	448 kg
Maximum vehicle speed	160 km/h
Acceleration 0-100 km/h	9.6 s
Fuel system	
Fuel - type	Hydrogen
Hydrogen tanks - quantity (H2)	2
Hydrogen tank - location (H2)	in front of rear axle
Hydrogen tank - content incl. reserve quantity (H2 - 700 bar)	4.4 kg
Hydrogen tank - total storage volume (H2)	120 l
Electric motor	
Structure	Internal rotor
Installation location	Rear axle
Operating voltage nominal	325 V
Max. output (as per ECE-R85)	155 kW
Rotational speed at max. output	4,500 rpm/min
Max. torque	365 Nm (certified)
Rotational speed at max. torque	0-4,000 rpm
High-voltage battery	
Model	Lithium-ion
Number of modules	2
Number of cells	100
Useful capacity	25.5 Ah
Energy content max..	13.5 kWh
Energy content useful	9.3 kWh
Capacity installed	37.0 Ah
Max. output	95 kW
Nominal voltage	365 V
Alternating current charging	
AC charging time 10%-100% SOC (net) mains outlet 1.2 kW Japan	12.45 h
AC charging time 10%-100% SOC (net) wallbox 3.2 kW Japan	4 h
AC charging time 10%-100% SOC (net) public 7.2 kW Japan	1.5 h

SN08.00-P-0001-05D	Control and display concept		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

General

The GLC F-CELL Type 253 receives an operating and display concept that has been adapted for the fuel cell and electric drive combination. Specific displays as well as an innovative design style clearly distinguish the fuel cell vehicle from the other vehicles in model series 253. The GLC F-CELL Type 253 is fitted with four individual user interfaces. In addition to the display for the instrument cluster and the Audio/COMAND display, a head-up display and a control element are provided for the climate control.

Instrument cluster

The instrument cluster of the GLC F-CELL Type 253 consists of a 12.3-inch display. The tubes known from the GLC 350 e 4MATIC for the instrument cluster are generated optically on the screen:

Tube display on left

- State of charge
- Hydrogen tank fuel level: when the reserve quantity is reached, the symbol of a hydrogen pump lights up yellow. In addition, the hydrogen reserve area is displayed permanently.
- Total range
- Current vehicle speed

Tube display on right

- Power meter with display of the currently called-up electrical power or the current recuperation.

Multifunction display

- Status display of the operating modes
- Status display of electrical range
- Hydrogen indicator lamp and F-CELL specific warning messages
- Status display of the transmission modes
- Preview assistant
- Status of the drive range and of the intensity of recuperation
- Sound generator

Digital instrument cluster full display

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Power meter

The power meter GLC F-CELL Type 253 displays the electrical power in a new way. The current electrical power request or the current recuperation is displayed. The current power request is shown in semicircular form at the top by means of segments in 1 % steps from 0 to 100 %; the current power is shown centrally as a figure in %.

The current recuperation is also shown in semicircular form, but at the bottom, by means of segments in %. When the vehicle is in the recuperation phase, a % value of recuperation appears.

If, for example, the electrical drive power is restricted due to a low state of charge of the high-voltage battery or very low outside temperatures, the power restriction state is permanently shown to the driver when electrical energy is taken from the high-voltage battery.

If the ECO display has been selected in the right-hand tube instead of the power meter, information about the drive power restriction is shown in the left-hand tube. Once a specific lower limit of drive power has been reached, the driver must acknowledge a warning message that appears in the middle display area.

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While the right-hand tube display can be selected, the left-hand tube is permanently visible.

Indicator lamps and warning messages

The GLC-F-CELL receives the usual GLC 350 e 4MATIC scope of indicator lamps and warning messages, plus those that refer to the fuel cell and the high-voltage battery.

This includes the warning message in the event of reduce drive power due to the following causes:

- Low state of charge of the high-voltage battery
- High-voltage battery too cold / too hot
- Fuel cell with excessively low temperature

Trip computer

The trip computer GLC F-CELL Type 253 provides data and information on average fuel consumption, trip time, average speed, travel distance and remaining range. The display screens have been copied, adapted and expanded by the GLC 350 e 4MATIC. The information is shown in the multifunction display.

The standard display "Trip" has also been copied by the GLC 350 e 4MATIC.

The display "After start/After reset" undergoes changes to the units and scalings such as kg and kWh.

The display "Range/present consumption" has also been copied by the GLC 350 e 4MATIC. The units and scalings have been adapted.

What's new is the display of the "Side of vehicle" on which the filler neck for the hydrogen and the socket for the charger feed-in are located.

The display of the current value when the charging current is limited is also new.

Resetting the trip computer takes place in the "Resetting values" menu by pressing the instrument cluster finger navigation pad (S163/1s10) in the instrument cluster multifunction steering wheel button group (S163/1)

Energy flow display

The energy flow display in the multifunction display graphically shows the energy removal or discharge in the high-voltage battery as well as in the fuel cell.

Energy flow display

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ECO display

The "ECO Score" display graphically displays the individual handling characteristics in the form of a pie chart. In addition to changing the units to kWh and kg as required, the combined range that can probably be achieved with the hydrogen and high-voltage battery is shown. An additional graphic provides information about the remaining distance to the destination.

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The individual vehicle behavior can be optimized to low consumption by means of the ECO transmission mode.

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Audio/COMAND display

With a GLC F-CELL-specific leap button, you can access the "Alternative drives" menu in the head unit and then the "F-CELL HYBRID" menu. The different energy flow states during vehicle operation can be followed in a submenu:

- Fuel cell and high-voltage battery are inactive: no energy flow
- Fuel cell and high-voltage battery are ready for operation: no energy flow
- Fuel cell charges high-voltage battery while the vehicle is at a standstill.
- Drive with energy from the fuel cell without energy from the high-voltage battery

- Electrical boost effect from the high-voltage battery and additional energy from the fuel cell All components are active.

The information about the transmission modes is adapted to the GLC F-CELL. These changes relate to the graphic and the icons in particular. For example, the fuel cell graphic replace the internal combustion engine graphic. The electric machine is shown above the rear axle. The "ECO" icon has been changed while the "Suspension" icon has been discontinued.

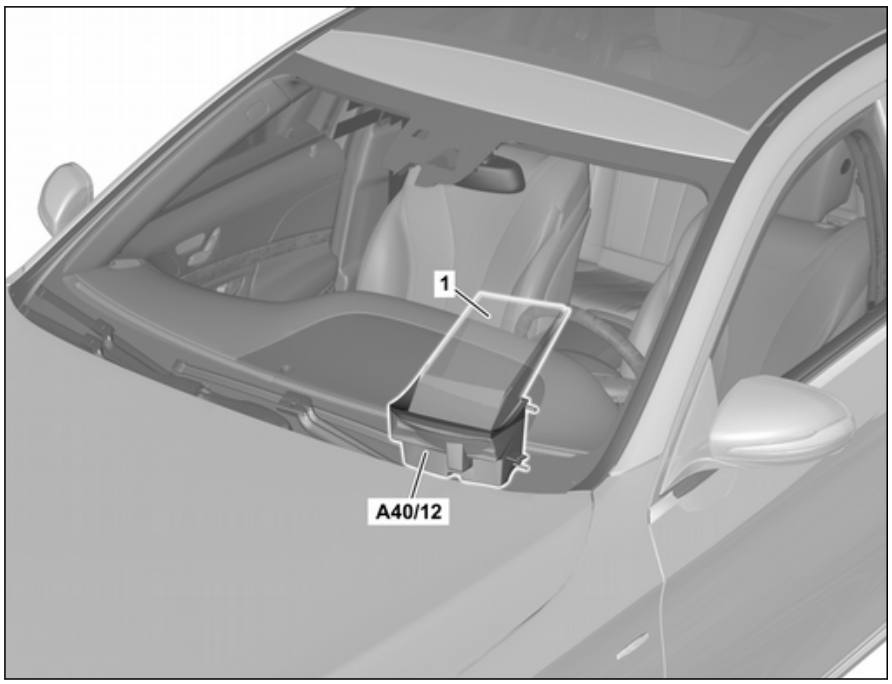
Audio/COMAND display

P54.33-5876-81

Head-up display

The head-up display is taken from the GLC SUV of model series 253. Only the content displayed between GLC and GLC F-CELL differ.

A40/12 *Head-up display*
1 *Projection surface*



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SN00.00-P-0080-01D	Operating strategy		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

General

The GLC F-CELL Type 253 is operated either with the fuel cell, the energy from the high-voltage battery or both together. The energy generated in the fuel cell covers the base load, particularly on longer journeys. Output peaks such as accelerations or driving uphill are covered by the high-voltage battery in boost mode. During recuperative braking, the electric machine ideally generates the entire braking torque as a generator. The high-voltage battery is charged with the electrical energy produced in the process. This is done automatically when the battery is empty.

Operating modes and transmission modes

The GLC F-CELL Type 253 has various operating modes and transmission modes. While the transmission modes change the vehicle's behavior and hence the driving experience, operating modes influence the interaction between the fuel cell and high-voltage battery. The combination of the transmission modes with the operating modes is used as standard equipment in this form for the first time in a fuel cell-vehicle.

Transmission modes

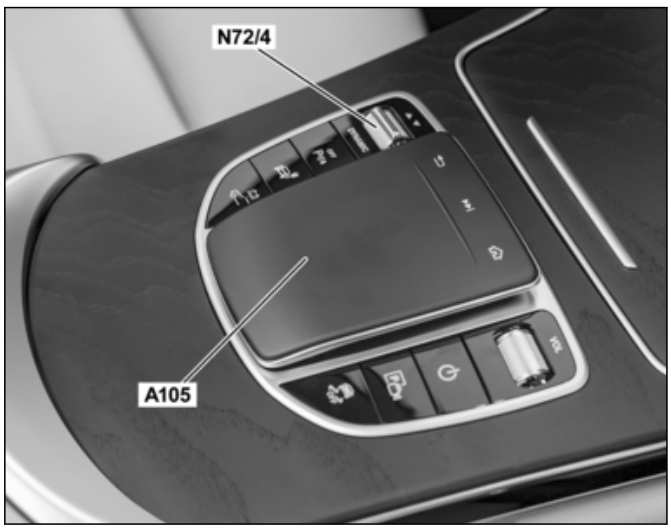
The transmission modes of the GLC F-CELL Type 253 include ECO, COMFORT, INDIVIDUAL and SPORT. ECO means a vehicle behavior optimized for low consumption. COMFORT is the default setting and offers not only convenient coordination but also ensure ideal climate control. The "Individual" transmission mode allows several parameters to be customized. In SPORT mode, the fuel cell powertrain is given a sporty design.

The transmission modes can be selected using the DYNAMIC SELECT switch in the lower control panel on the left (N72/4).

The operating modes can be selected directly via the touchpad (A105).

Lower control panels

A105 Touchpad
N72/4 Left lower control panel



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Operating modes

The following operating modes can be selected via the lower control panel on the left:

- HYBRID (preset)
- BATTERY
- F-CELL
- CHARGE

The operating modes with their characteristics:

(HYBRID)

- Combined use of both power sources for drive system.
- Operation of fuel cell as often as possible in lowest consumption range.
- Coverage of output peaks via high-voltage battery.
- Output reserve for situations during acceleration via the high-voltage battery (boost effect).

BATTERY

- Exclusive use of the high-voltage battery for the drive system
- The fuel cell system is deactivated.
- Ideal mode for short-haul operation.

F-CELL

- The battery's charge level is maintained via the electrical power produced by the fuel cell.
- Ideal mode if the advantages of the hydrogen tank are greater than those of the electric charge of the high-voltage battery.

CHARGE

- Charging the high-voltage battery has priority.
- This mode creates reserve powers for short-haul operation or to cover output peaks.

In all operating modes, the system has a recuperation function. It allows energy to be recuperated during braking and coasting and to be stored in the battery.

The GLC F-CELL Type 253 has paddles behind the steering wheel. Actuating the paddles influences the strength of the recuperation and thus the quantity of electrical power that flows into the high-voltage battery.

Intelligent engine management

The intelligent drive management for hybrid vehicles takes into consideration the course of a road and the traffic situation in advance, so as to be able to consume the energy of the high-voltage battery efficiently and in the best possible manner while driving. To this end, information about the radar sensor system, the multifunction camera and the navigation system COMAND Online is used.

The intelligent drive management also reduces the vehicle's consumption and increases the electrical range. And last but not least, it provides support in numerous driving situations and thus offers the driver a high level of comfort.

The functions of the intelligent drive management are:

- Intelligent recuperation
- ECO Assistant

Intelligent recuperation

The regenerative brake system is used as an alternator for recuperation in order to enable the use of the electric motor depending on the driving situation. The recuperation is flexibly adapted to current and future traffic situations. For this, apart from the radar data, the vehicle also evaluates other information such as map and camera data from the Traffic Sign Assist. Depending on the situation, regained energy can be efficiently stored as kinetic energy or electrical energy, and, in this way, the range can be increased.

The function increases the range by efficiently storing the energy:

- As kinetic energy, if overrun mode makes sense.
- As electrical energy, if deceleration by means of recuperation is ideal.

Evaluation of the driving situation takes place using information on the surroundings (sensor fusion) with the help of radar data, camera data and map data.

The correct regenerative torque is adjusted via recuperation steplessly from free rolling up to a predefined deceleration.

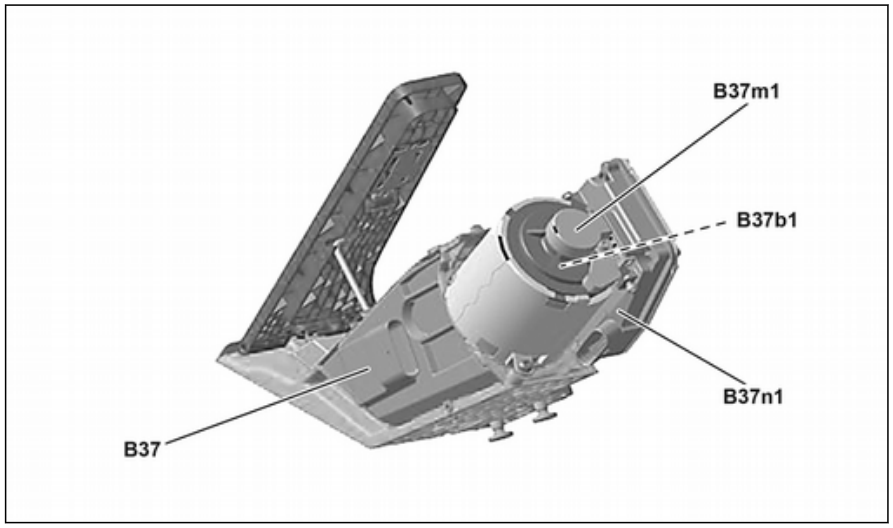
Information regarding distance and speed differential is provided by the radar sensor system. A distance control system calculates the ideal acceleration or deceleration depending on the traffic situation. Additionally, the speed limits recorded by the multifunction camera are evaluated and adapted to the recuperation. The speed limits from the map data are evaluated in advance and adapted to the recuperation by means of coasting simulation. For the customer, the adaptations of recuperation are illustrated in the energy flow diagram of the instrument cluster and by means of the current recuperation performance in the power meter.

ECO Assistant

ECO Assist supports the driver in achieving an economic and comfortable driving style. In the "ECO" transmission mode, the overrun torque that occurs during driving is reduced to a minimum, which allows maximum use of cruising mode. In this way the vehicle can roll for an additional distance rolling when the accelerator pedal is released. Strong braking after a longer stretch in cruising mode or cruising mode occurring too early with subsequent renewed support by the fuel cell is disadvantageous. For this reason, a haptic accelerator pedal was installed for the ECO assistant. When using the radar sensor system installed in the vehicle, the clearance and the speed to the vehicle driving immediately ahead are recognized. In the very moment in which release of the accelerator pedal leads to consumption-optimized matching of the speed to a vehicle driving immediately ahead, the ECO assistant engages. As soon as the pedal is released, the fuel cell is switched off for available electrical operation, decoupled via the clutch from the drive train and the vehicle switches into cruising mode.

If the vehicle driving immediately ahead reduces its speed or if the clearance to it reduces due to other factors, the radar-based thrust control engages. Through adaptation of the thrust torque of the electrical machine the clearance to the vehicle driving immediately ahead is compensated for according to the driving situation.

B37 *Accelerator pedal sensor*



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SN00.00-P-0080-15D	Electrical system		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Overview of the on-board electrical systems

The power supply in the GLC F-CELL Type 253 is provided by two separate on-board electrical systems, the high voltage on-board electrical system with a high-voltage battery and the 12 V on-board electrical system with a 12 V battery.

High voltage on-board electrical system with high-voltage battery

This is the first time that a lithium-ion battery is used to supply the electric power for stand-alone driving in an electric vehicle with a fuel cell. The powerful lithium-ion high-voltage battery has a usable energy content of 9.3 kWh and is located in the rear end of the GLC F-CELL Type 253.

The high-voltage battery facilitates driving with battery power alone up to 50 km in the NEDC. The external charging is performed via a 230 V socket, a wallbox or a public charging station via the vehicle's own alternating current charger for high-voltage battery.

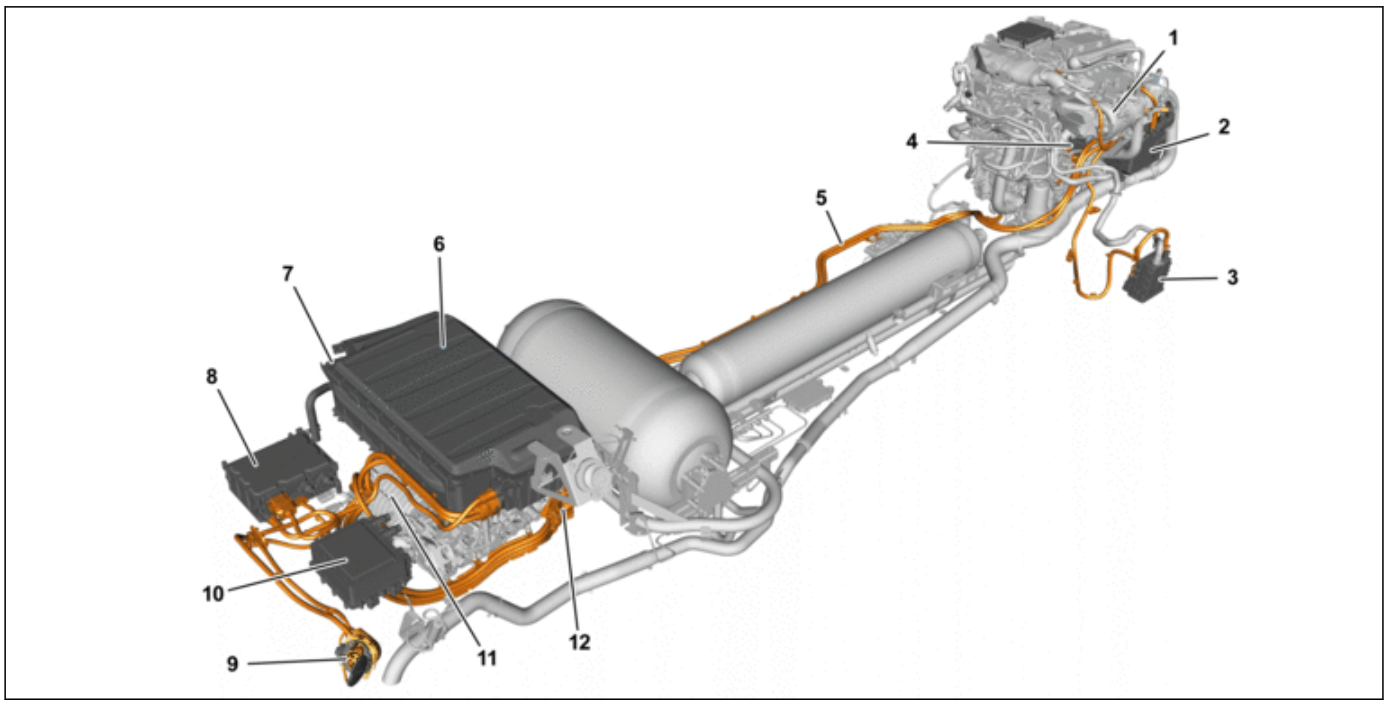
The internal charging is performed via the electric power gained in the fuel cell stack. It is forwarded to the DC/DC converter via the power distribution unit. This converter adjusts the voltage level to that of the battery voltage so that charging the high-voltage battery is made possible. In deceleration mode and during braking, charging is performed via recuperation. The electric motor then works as an alternator.

12 V on-board electrical system with 12 V battery

The 12 V on-board electrical system is supplied with energy from the high-voltage on-board electrical system by means of the DC/DC converter. In the process, the DC/DC converter generates 12 V direct voltage from the HV direct voltage of the high voltage on-board electrical system and charges the 12 V on-board electrical system battery.

Vehicle network support

All control units used in the GLC F-CELL model 253 are supplied via the 12 V on-board electrical system battery. The on-board electrical system support ensures that it is charged at all times. If the battery's state of charge or the outside temperature falls below a threshold value during vehicle operation, the battery is charged via the DC/DC converter. In doing so the comfort functions in the on-board electrical system are switched off for the duration of the charging.



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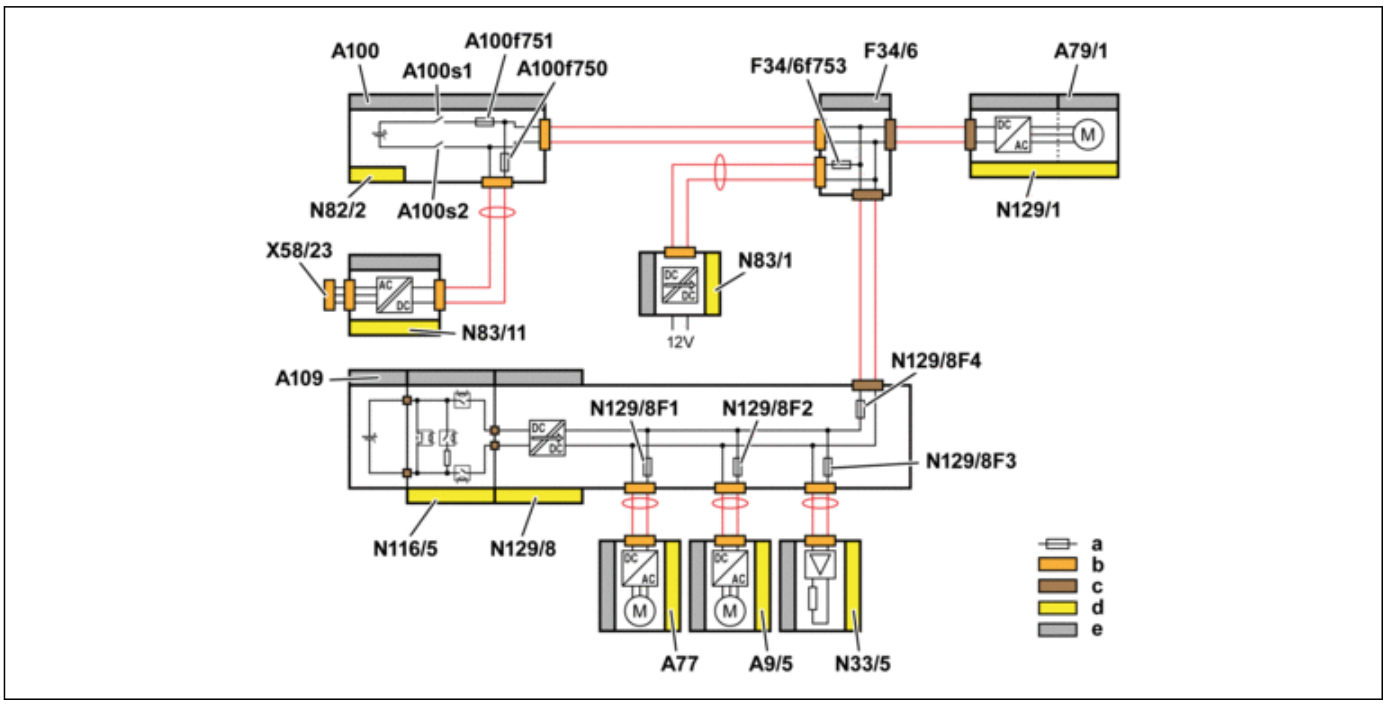
Overview of the high-voltage components

1	*Exhaust air turbocharger*	*7*	*Battery management system control unit*
2	*Fuel cell DC/DC converter control unit*	*8*	*Alternating current charger for high-voltage battery*
3	*High-voltage PTC heater*	*9*	*Feed-in socket for alternating current charger for high-voltage battery*
4	*Fuel cell management system control unit*	*10*	*DC/DC converter control unit*
5	*High-voltage lines*	*11*	*Electric machine*
6	*High-voltage battery module*	*12*	*High-voltage distributor plate*



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Block diagram of high voltage on-board electrical system

A9/5	*Electrical refrigerant compressor*	*F34/6f753*	*Electrical fuse 753*	*N129/8F3*	*Fuse 3*
A77	*Exhaust air turbocharger*	*N33/5*	*High-voltage PTC heater*	*N129/8F4*	*Electrical fuse 4*
A79/1	*Electric machine*	*N82/2*	*Control unit for battery management system*	*X58/23*	*Charger feed-in socket*
A100	*High-voltage battery module*	*N83/1*	*DC/DC converter control unit*		
A100f750	*Electrical fuse 750*	*N83/11*	*Alternating current charger for high-voltage battery*	*a*	*Fuse*
A100f751	*Electrical fuse 751*	*N116/5*	*Fuel cell management system control unit*	*b*	*Plug-in connector*
A100s1	*Contactor 1*	*N129/1*	*Power electronics control unit*	*c*	*Screw connection*
A100s2	*Contactor 2*	*N129/8*	*Fuel cell DC/DC converter control unit*	*d*	*Control unit*
A109	*Fuel cell stack*	*N129/8F1*	*Fuse 1*	*e*	*HV component*
F34/6	*High-voltage distributor plate*	*N129/8F2*	*Electrical fuse 2*		

High-voltage battery

The high-voltage battery is located beneath the passenger compartment and consists of 2 modules connected in series with 100 lithium-ion cells of the latest generation.

When fully charged, the high-voltage battery delivers a nominal output voltage of 365 V. Contactors integrated in the high-voltage battery module can, if necessary, disconnect the high voltage outlet of he high-voltage battery from the high voltage on-board electrical system. The high-voltage battery also supplies the 12 V on-board electrical system with power via the DC/DC converter.

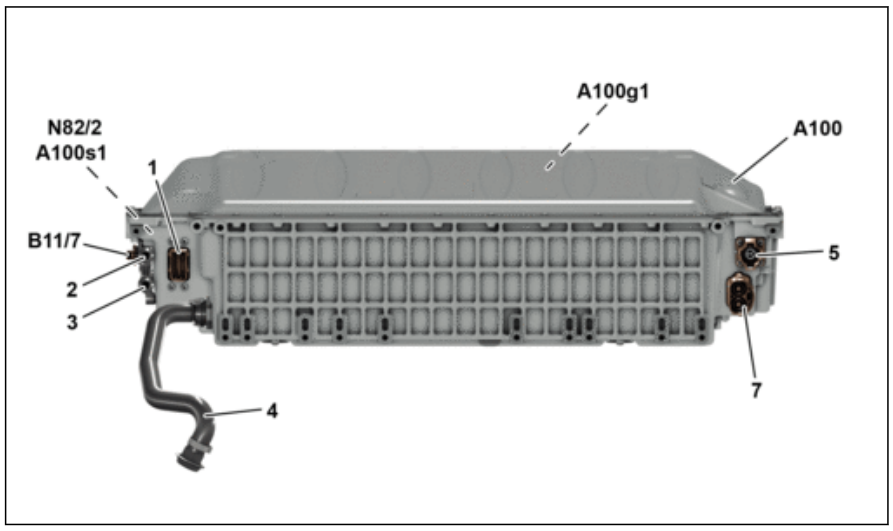
The permissible operating temperature of the high-voltage battery is -25 °C to +60 °C. The temperature of the high-voltage battery is recorded by temperature sensors in the battery management control unit.

High temperatures reduce the service life of the high-voltage battery. The high-voltage battery is therefore cooled via a coolant circuit under normal operating conditions. At high temperatures, the coolant is cooled via a heat exchanger refrigerant coolant (chiller) of the air conditioning system. This guarantees optimum battery power.

See Chapter "Cooling"

Shown on high-voltage battery module

1	*Control unit plug connection*
2	*Coolant feed*
3	*Coolant return flow*
4	*Degassing pipe*
5	*High voltage connection of alternating current charger for high-voltage battery*
7	*Power electronics control unit high-voltage connection*
A100	*High-voltage battery module*
A100g1	*High-voltage battery*
A100s1	*Contactor*
B11/7	*Low-temperature coolant circuit 2 temperature sensor*
N82/2	*Battery management control unit system*



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Notes on the high-voltage battery

When properly used, the high-voltage battery will not present any hazard.

Information on safe handling

To rule out the danger of a short circuit, mechanical damage, e.g. due to pressure, must be avoided. In the event of thermal loads (effect of heat, welding), danger arises. During painting work and oven drying, please comply with the Service Information SI98.00-P-0020A. The formation of poisonous and caustic gases creates a risk of injury. As per the information in the repair instructions, personal protective equipment should also be worn in addition to safety shoes. After an accident, please comply with the following Service Information: SI54.10-P-0035A

Notes on the service life of the high-voltage battery

If the vehicle is switched off for an extended period of time, ensure a sufficient SOC of the high-voltage battery. Otherwise, it may be pre-damaged or damaged due to deep discharging. If the vehicle is out of operation for more than 6 weeks, the battery suffers nonuse damage.

Temperatures below -25 °C and over 40 °C to which the vehicle is exposed for more than 7 days can result in irreversible battery damage. The vehicle must not remain at a standstill with a discharged battery for longer than 14 days. Otherwise, battery damage may be the result.

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High-voltage batteries that have been damaged during operation or due to an accident must be examined and tested by an electrician for HV systems in power vehicles, whose working area is in series production vehicles. Damaged high-voltage batteries must not be installed in a vehicle.

i

Please note the general information about the high-voltage battery: AH54.10-P-0006-01MEV

Power supply equipment

All components involved in the charging process (alternating current charger for high-voltage battery, charge socket, charging cable) of the GLC F-CELL Type 253 have been standardized in accordance with international standards (e.g. IEC62196-2) in such a way that they are

future-proof. This facilitates easy charging at vastly differing electricity grids and power supply equipment.

The GLC F-CELL Type 253 can be charged both at a mains outlet as well as at a public charging station or wallbox. When charging at a mains outlet, the charging current must be limited if necessary to ensure that the local power network is not overloaded. The maximum permissible charging current can therefore be set via the control box in the charging cable.

As soon as the charging cable has been connected, the vehicle's own alternating current charger for high-voltage battery communicates via a discrete control line (Control Pilot) with the control box in the charging cable or the charging station. At the same time, the performance data on the power supply equipment is relayed and the power consumption of the alternating current charger for the high-voltage battery is adapted accordingly. Only then does the alternating current charger initiate the charging process. At the same time, it monitors the voltage, amount of charge and the charging period in order to protect the high-voltage battery. With the alternating current charger installed in the GLC F-CELL Type 253 for high-voltage battery, a maximum charging capacity of 7.2 kW is possible. As such, the charging time can be reduced considerably, to 1.5 hours in fact.

The exact procedure for charging and the various charging methods can be found in the current operator's manual.

For data about the charging times, see Chapter "Technical data"

P88.60-2700-76

Charging cable for charging via the mains outlet (mode 2)

The single-phase charging cable, available in two length variants, has been adapted to meet country-specific standards and it is supplied in a pocket in the load compartment.

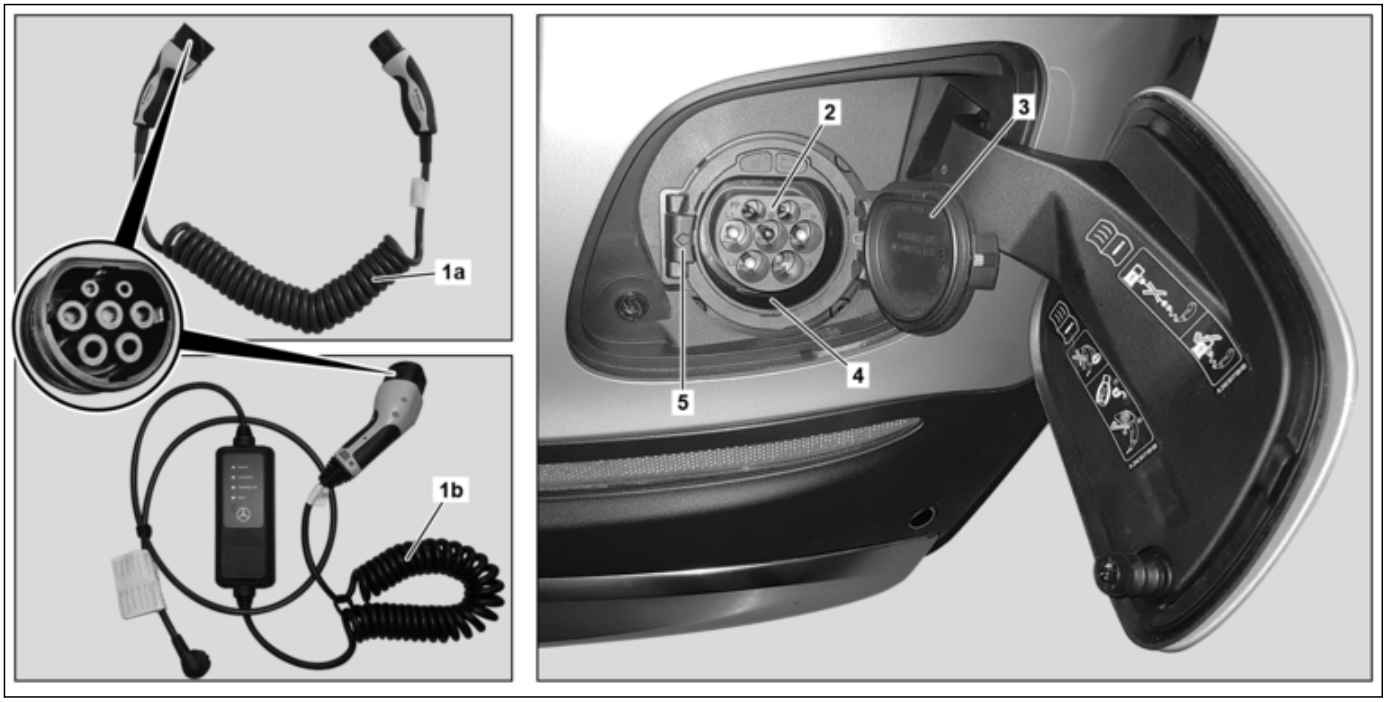
The charging cable includes the In-Cable Control and Protecting Device (IC-CPD). To meet the safety requirements as per IEC61851 a ground fault circuit breaker and a communication device (PWM module) for setting the power are integrated. To protect users and the electric vehicle, the IC-CPD fixed permanently into the

charging cable switches the power contacts between the vehicle's plug-type connection and the infrastructure side, and sends the charging current upper limit to the vehicle. In the event of a fault or if there is a voltage drop, the charging process is interrupted immediately. The charging cable switches the power contacts between the vehicle's plug-type connection and the shockproof plug only after the vehicle requests voltage. Connectors not plugged in are therefore de-energized.

Charging cable for public charging stations (mode 3)

The single-phase charging cable has been adapted to the country-specific standards, and it is available as special equipment in two length versions.

The mode 3 charging cable forms a connection between the vehicle and the standardized power supply as per IEC61851, known as the "Electrical Vehicle Supply Equipment" (EVSE). Residual current protection, overcurrent protection, shutoff and a specific charge socket are integrated in the EVSE. The charging cable contains a resistance coding for the maximum current load capacity of the cable, and the standardized plug contacts to the vehicle and infrastructure side. The charging station only switches the power contacts after voltage is requested by the vehicle. The vehicle or charging station connections not plugged into the vehicle are therefore not plugged in and de-energized.



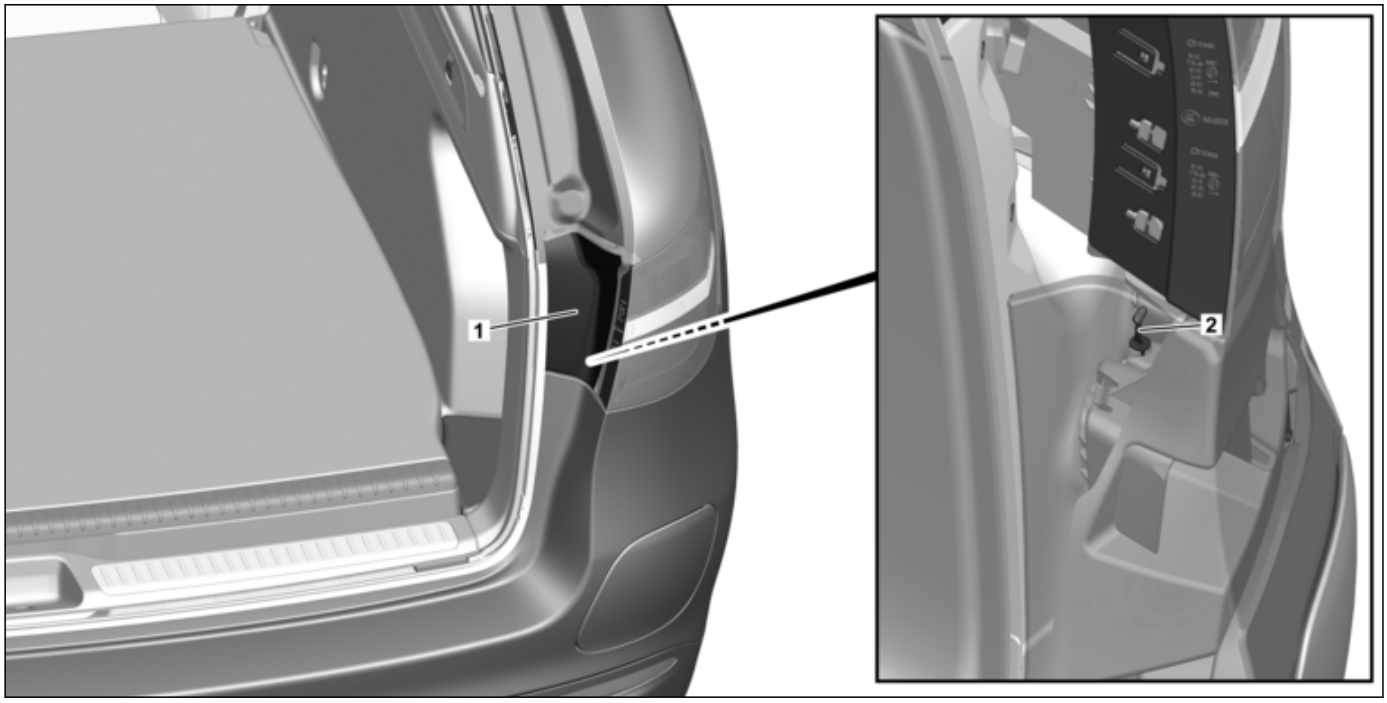
P54.10-4820-09

1a	*Charging cable for mode 3*
1b	*Charging cable mode 2*
2	*Charger feed-in socket*
3	*Cap*
4	*Sequence*
5	*Lock*

Emergency release of vehicle socket

The connector of the charging cable is protected against unauthorized removal during the charging process. It is locked in the charger feed-in socket via the actuator motor of the electric lock.

If the charging cable cannot be unplugged after a charging process from the vehicle socket (in event of a fault), the actuator motor for the electric lock can be unlocked with an emergency release cable. The emergency release cable is located on the right-hand edge of the trunk. To gain access to the emergency release cable, the covering has to be removed beforehand. When the emergency release cable of the manual release mechanism is pulled, the disk of the manual emergency release is rotated and the charging cable plug is unlocked.



P54.10-4794-09

1 Cover

2 Emergency release cable

Start-off protection

To prevent the vehicle from driving away during a charging process or when the charging cable is plugged in, the start-off protection is activated when the plugged-in charging cable connector (Proximity=ON/SNA) is detected. The instrument cluster displays a warning message to this effect.

The start-off protection is realized here in two variants dependent on the vehicle speed:

Plugged-in charging cable connector is detected while driving (v > km/h)

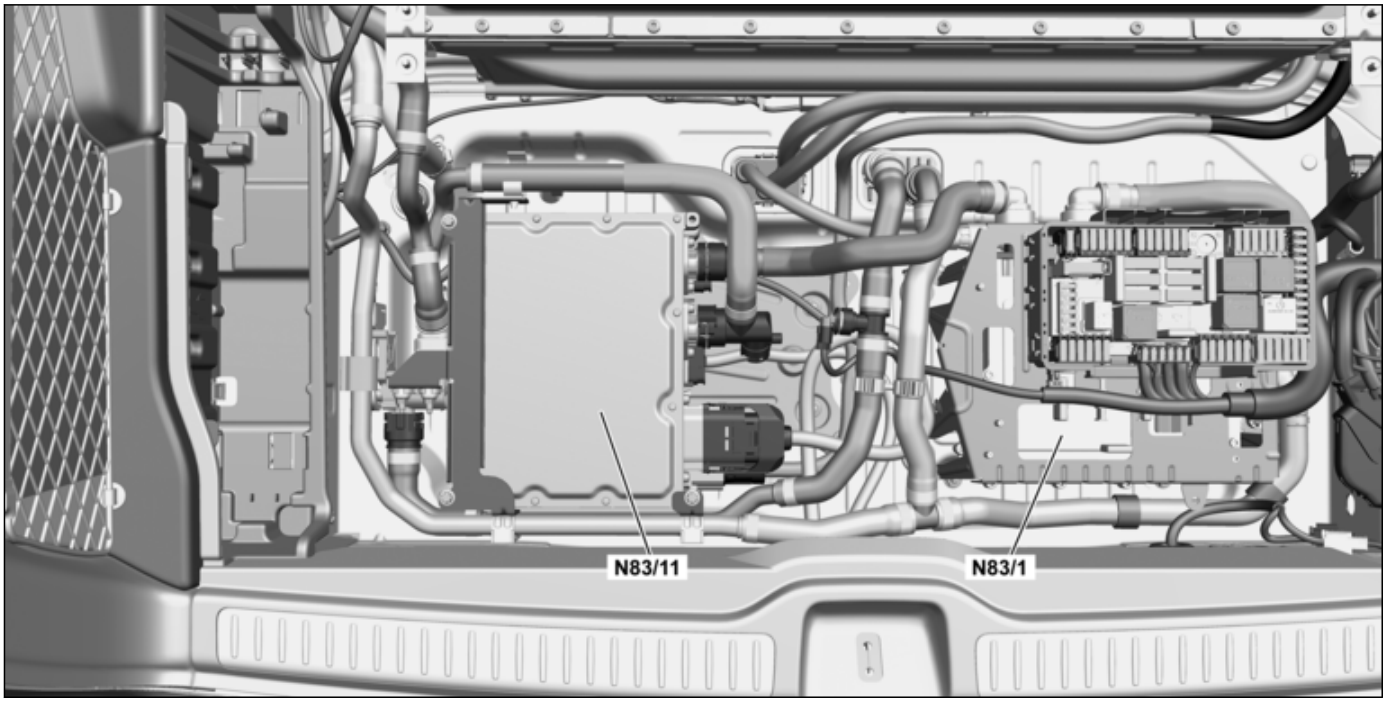
If, while driving (v > 5km/h) a supposed plugged-in charging cable connector (Proximity=ON) or in the event of a defective charger the substitute value (Proximity=SNA) is detected, then the start-off protection is not activated until drive range "P" is engaged.

Plugged-in charging cable connector is detected at standstill (v < 5 km/h)

If a plugged-in charging cable connector (Proximity=ON) is detected in the drive range "P" or at v < 5 km/h, the start-off protection is immediately activated. If a charger is faulty, the substitute value (Proximity=SNA) is formed. In this instance, the drive-away protection is not activated until gear range "P" is engaged.

Alternating current charger for high-voltage battery

The alternating current charger for high-voltage battery is located in the rear area in the multifunction recess. It converts the alternating voltage of an external voltage source, e.g. charging station, into direct voltage.



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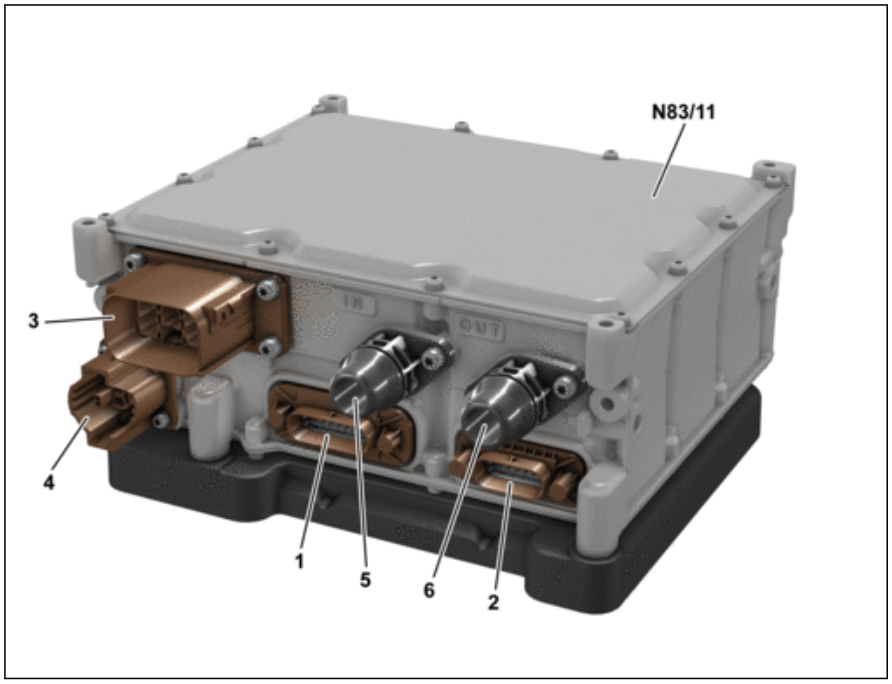
N83/1	*DC/DC converter control unit*	*N83/11*	*Alternating current charger for high-voltage battery*

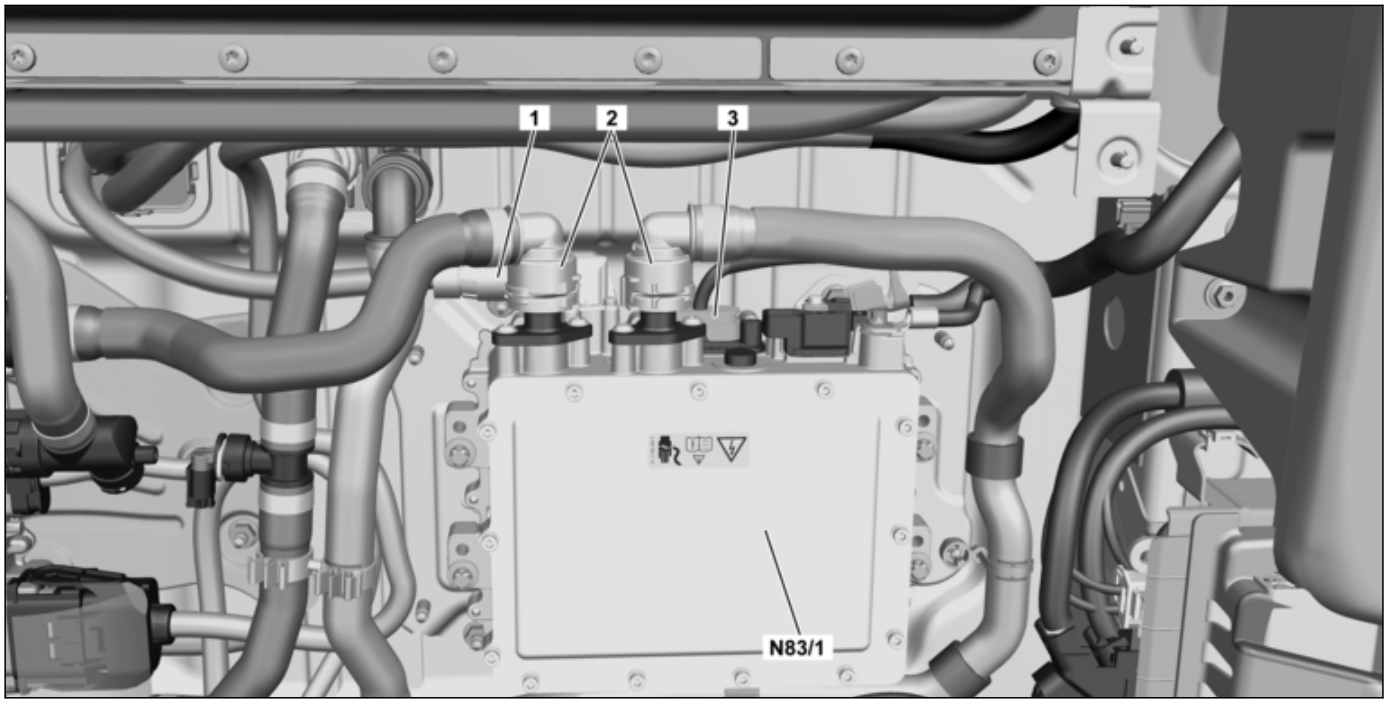
N83/11	*Alternating current charger for high-voltage battery*
1	*Control unit plug connection (charger feed socket (X58/23))*
2	*Control unit plug connection (vehicle)*
3	*High-voltage connection AC*
4	*High-voltage connection DC*
5	*Coolant line inlet connection*
6	*Coolant line outlet connection*



P54.10-4809-76

DC/DC converter control unit

The DC/DC converter is located in the rear area in the multifunction recess. It generates the 12 V direct voltage for the 12 V on-board electrical system from the direct voltage of the high-voltage battery.



P54.10-4811-09

N83/1	*DC/DC converter control unit*
1	*High-voltage connection*
2	*Coolant line connection*
3	*Control unit plug connection*

Power electronics

The power electronics is integrated into the drive system and directly connected to the high voltage distributor plate and the coolant circuit. Its tasks are as follows:

- Voltage supply
- Controlling the electric motor drive
- Monitoring the temperature and position of the electric motor
- Creating diagnoses and forecasts of the available torque for the powertrain control unit

To operate the electric motor, the DC/AC converter in the power electronics generates the 3-phase alternating current from the direct voltage of the high-voltage battery and the control unit for the DC/DC converter fuel cell. The rotational speed, rotor position and temperature of the electric motor are recorded by the power electronics.

If the electric motor is operated as an alternator in deceleration mode, the power electronics converts the induced alternating voltage into a direct voltage, and thus supplied energy to the high voltage on-board electrical system.

High-voltage power distributor

The GLC F-CELL Type 253 contains two high voltage energy distributors: the fuel cell DC/DC converter control unit (N129/8) and the high voltage distributor plate (F34/6).

The fuel cell DC/DC converter control unit is located in the engine compartment, on the right, beside the fuel cell stack. It converts the direct voltage generated in the fuel cell stack into a high voltage direct voltage and supplies energy to the following high voltage components:

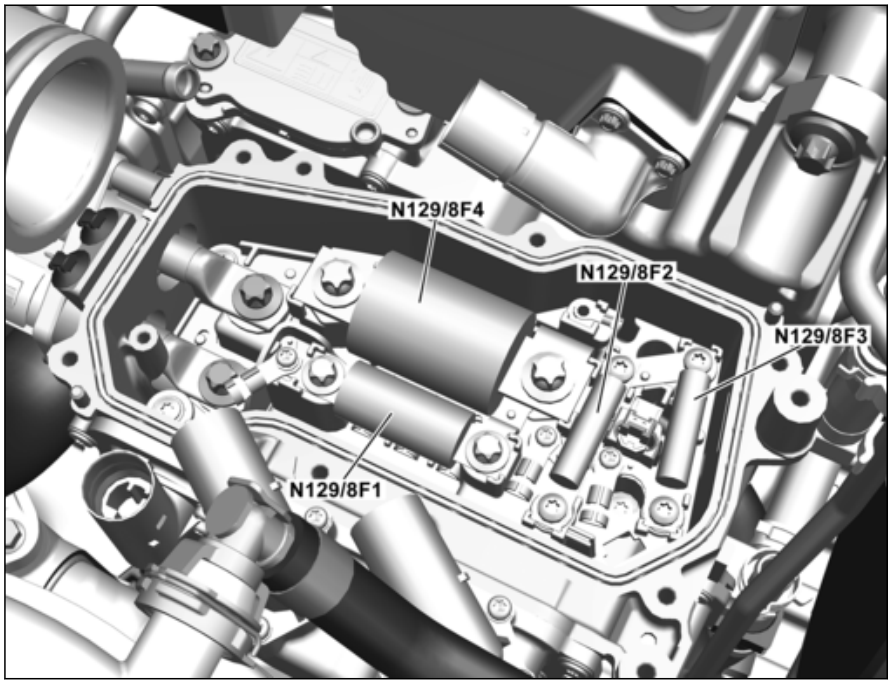
- High-voltage PTC heater
- Exhaust air turbocharger
- Electric refrigerant compressor
- High-voltage distributor plate

To protect the lines of the high voltage components, four fuses are laid out for the fuel cell DC/DC converter control unit. The high voltage fuses are accessible and can be changed.

The high voltage distributor plate (F34/6) is located at the rear, to the right, beside the electric machine. The high voltage distributor plate is supplied with high voltage direct voltage either by the high-voltage battery or the fuel cell DC/DC converter control unit. The high voltage direct voltage is then distributed centrally to the power electronics control unit and the DC/DC converter control unit.

To protect the lines of the DC/DC converter, there is a fuse in the high voltage distributor plate. The high voltage fuse is accessible and can be changed.

N129/8F1	*Fuse 1*
N129/8F2	*Electrical fuse 2*
N129/8F3	*Fuse 3*
N129/8F4	*Electrical fuse 4*



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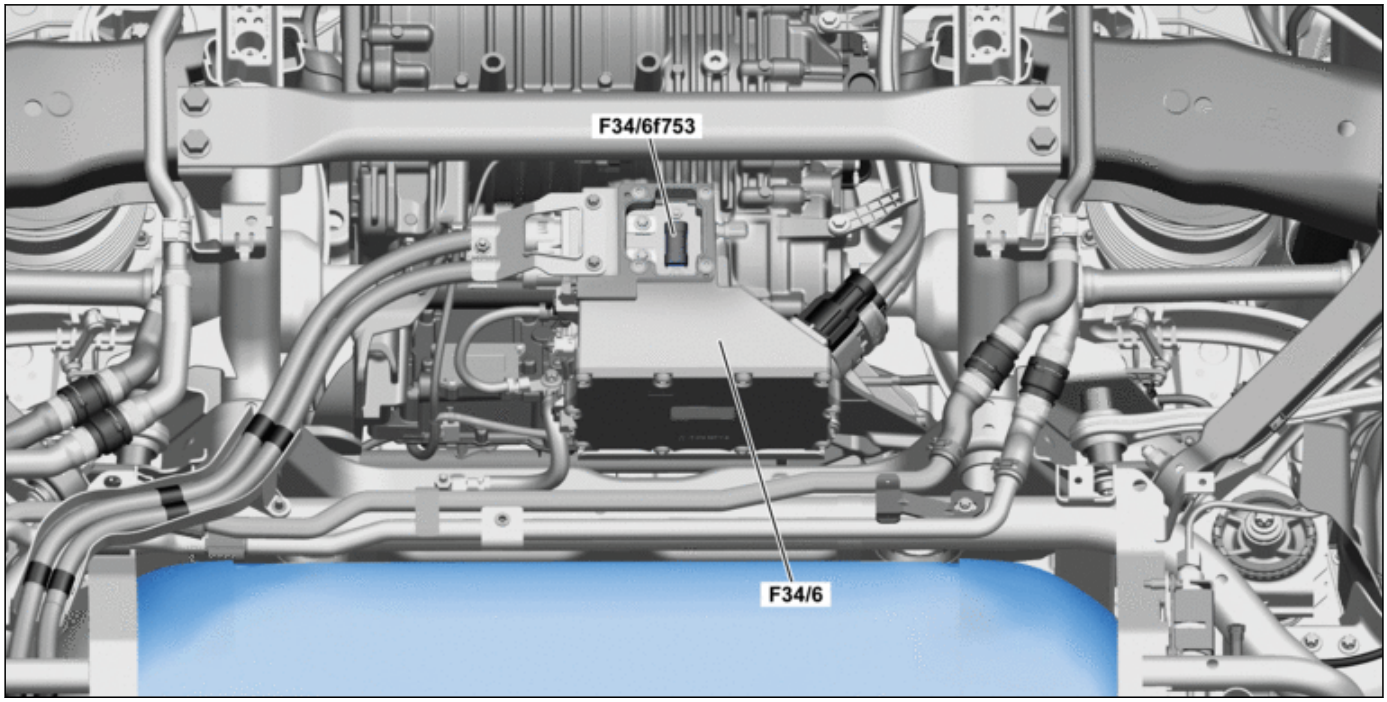


P54.10-4814-79

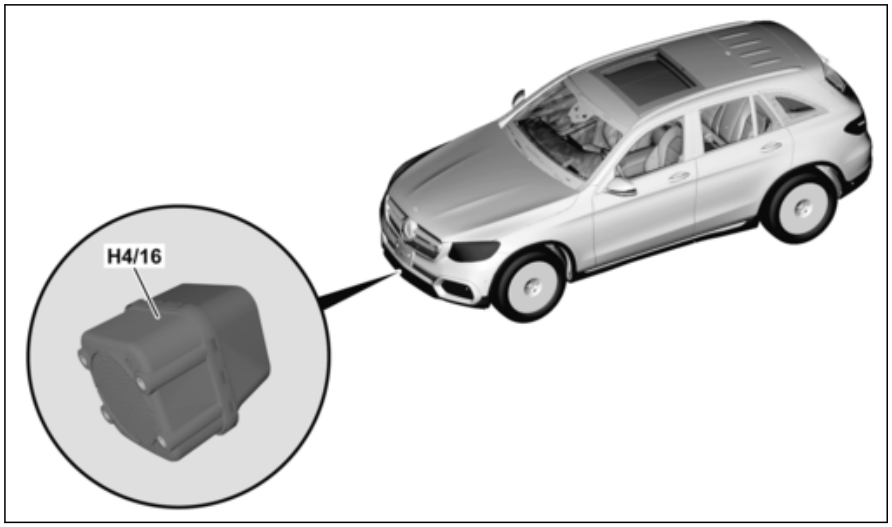
F34/6	*High-voltage distributor plate*	*F34/6f753*	*Electrical fuse 753*

Acoustic ambient protection

Since the vehicle is very quiet at low speeds in all operating modes, there is a danger that it will not be noticed by other road users, or will not be noticed until a very late stage. A sound generator is used to create a technical acoustic presence indicator.

The sound generator consists of a control unit, an audio end stage and a speaker. It is located in the vehicle at the front right above the lower front engine compartment paneling. Depending on speed and accelerator pedal position, the electric vehicle sound generator generates an audio signal between 0 and 30 km/h. At speeds greater than 30 km/h, the sound generator is deactivated, as the vehicle's rolling and wind noises are loud enough.

H4/16 *Sound generator*



P08.20-2160-05

Regenerative braking system (RBS)

The drive concept permits recuperation during vehicle deceleration. The electric machine is operated as an alternator and generates a braking torque on the wheels. The electric power generated flows back into the high-voltage battery. Energy management controls the return flow of the energy. The possible recuperation power depends on the state of the high-voltage battery (state of charge and temperature). The driver can influence the strength of the recuperation and the associated drag deceleration via the brake pedal (approx. 10% pedal travel) himself.

During the vehicle's drag deceleration, a distinction is made between three possible operating conditions:

- Recuperation already takes place when coasting purely with deceleration. The electric machine then works as an alternator. Recuperated energy is stored in the high-voltage battery.
- When the brake pedal is pressed slightly, the vehicle is decelerated more strongly by the electric machine and recuperation increased.

- If the brake pedal is pressed more strongly, the service brake is also used to decelerate the vehicle. Both systems work together in these driving conditions.

A distinction is made between manual and radar-assisted recuperation. The following recuperation levels are available to the driver:

- D + minimum recuperation corresponds to deceleration mode.
- D standard recuperation
- D - high recuperation
- D auto radar-assisted recuperation

Steering wheel shift paddles / manual recuperative braking

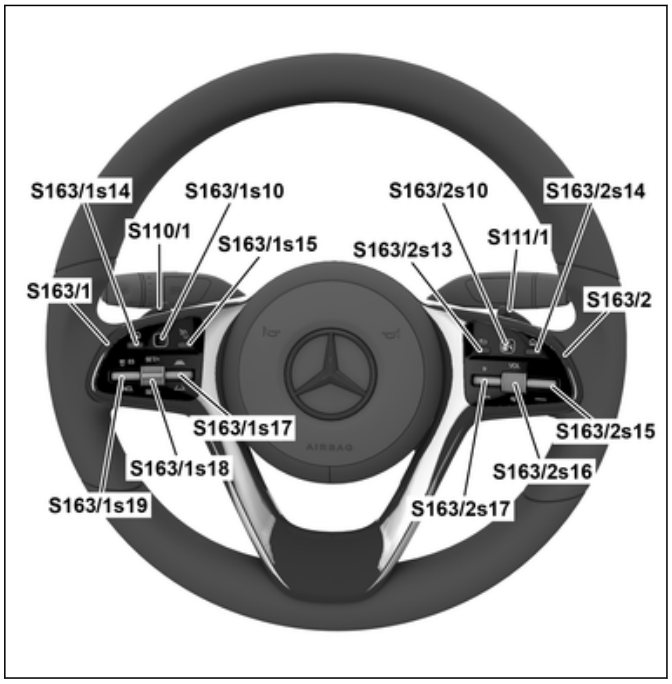
The standard equipment with steering wheel gearshift buttons allows the customer to shift up or down, just like a conventional drive. To access manual recuperation mode, briefly press one of the paddles. The right-hand paddle reduces the recuperation (just like shifting up in a conventional drive). The left-hand paddle increases the drag recuperation (just like actively shifting down in a conventional drive). The available maximum recuperation depends on the vehicle speed and the current state of charge and temperature of the battery.

The steering wheel downshift and upshift buttons are used for adjusting the engine drag torque manually. This allows the driver to regulate the intensity of the recuperation.

Multifunction steering wheel button groups, shown on sport variant, left-hand drive vehicle

S110/1 Steering wheel downshift button

S111/1 Steering wheel upshift button

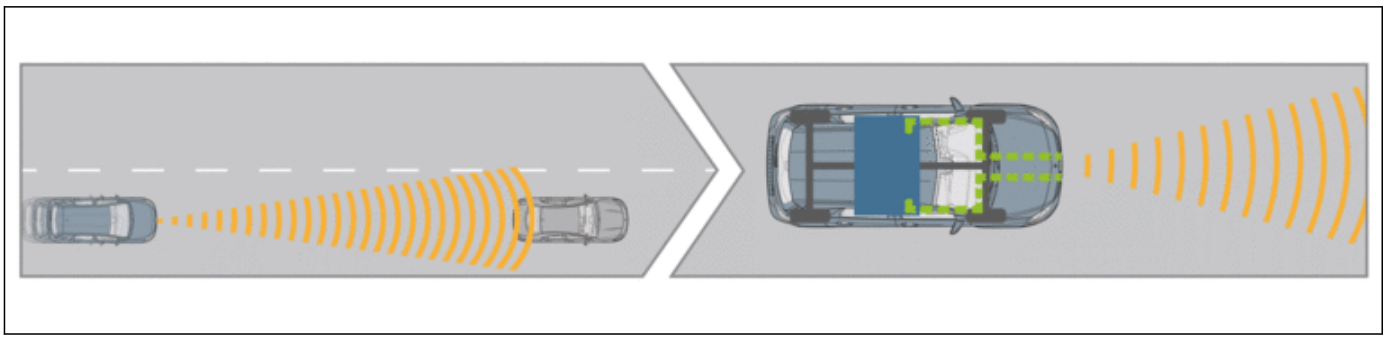


P82.90-2555-12

Radar-supported regenerative braking

The electric control unit for the Active Distance Assist DISTRONIC detects the distance and the speed differential to the vehicle in front and sends this information via the suspension FlexRay to the powertrain control unit. Through relative speed and the distance to the vehicle immediately ahead, a target deceleration (negative acceleration) is calculated. From this a desired force or desired torque is created which is as engine drag torque. Deceleration by means of an increase in regenerative torque occurs when approaching a slower vehicle, when approaching a decelerating vehicle or when following a vehicle along a downhill stretch.

The relative speed and the distance are detected by the electric control unit for the Active Distance Assist DISTRONIC and sent via the suspension FlexRay to the powertrain control unit. The powertrain control unit calculates the corresponding specified deceleration and sends the request for regenerative braking torque via the drive CAN to the power electronics control unit. The power electronics control unit actuates electrical machine motor-driven.



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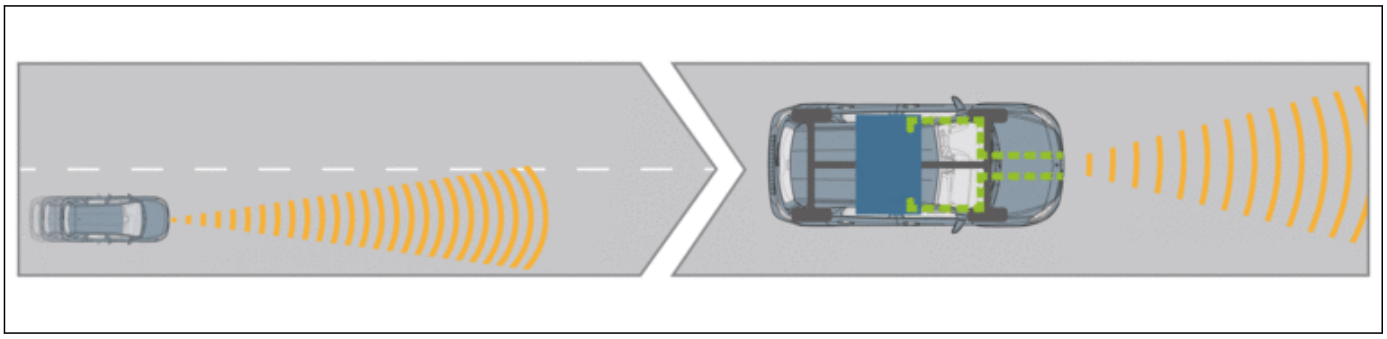
The radar detects a vehicle in front driving more slowly and provides the relevant data (distance, relative speed, etc.) on the suspension FlexRay.

Automatic initiation of the stepless increase in recuperation (just like shifting down in a conventional drive) in order to maintain the same distance from the vehicle in front ‣ Saving the kinetic energy in electrical energy



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There is no vehicle in the radar's detection range or a detected vehicle is moving away

Automatic stepless reduction in recuperation until free rolling/coasting is guaranteed. To prevent free rolling, e.g. towards a red traffic light or an intersection, overrun mode is restricted in urban traffic. To prevent an excessive increase in speed, recuperation when traveling downhill on a steep slope is adjusted. ‣ No energy consumption

Intelligent recuperation

Intelligent recuperation is based on radar-assisted recuperation. In addition to the "Recuperation during downhill driving and distance regulation tasks" and "Overrun mode" functions, it also contains the "Recuperation based on speed limits" subfunction. This addition evaluates the speed limits recorded by the camera and adjusts the level of recuperation steplessly as required. To adjust recuperation by simulating coasting, the speed limits on the map are taken into consideration on a pre-emptive basis. The basis for intelligent recuperation is the "Speed Limit Assist" function. This basis is available in all GLC F-CELL Types 253.

The evaluation of the driving situation and adaptation of the recuperation is therefore performed on the basis of ambient information (sensor merger), e.g. via radar, camera and map data.

SN20.00-P-0010-01D	Cooling		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

The cooling system in general

The thermal management of the GLC F-CELL Type 253 includes the cooling of the fuel cell, the climate control of the vehicle interior and the cooling of the components of the high-voltage on-board electrical system. The fuel cell system and the components of the high-voltage on-board electrical system are cooled by three closed, separate coolant circuits:

- High-temperature circuit
- Low-temperature circuit 1
- Low-temperature circuit 2

The high-temperature cooling circuit takes over the cooling of all components of the fuel cell system that are involved in cold combustion as well as the climate control of the vehicle interior. The flow temperature of the fuel cell must be 68 °C. The flow temperature lies in a range from 50 °C to 80 °C.

Low-temperature circuit 1 cools the electric machine and the DC/DC converter, the PDU (Power Distribution Unit) and the exhaust air turbocharger of the fuel cell system..

Low-temperature circuit 2 cools the high-voltage battery, the DC/DC converter and the alternating current charger for high-voltage batteries.

Each of the low-temperature circuits has one and the high-temperature cooling circuit two variable speed coolant pumps as well as various regulation valves.

- -

The cooler for the high-temperature circuit, the two coolers of the low-temperature circuits and the condenser are integrated in one cooling module with side coolers. A fan motor located centrally behind it (M4/7) ventilates the cooling module. The fan motor and all coolant pumps are activated by the powertrain control unit (N127) via LIN. In the high-temperature cooling circuit, a particulate filter protects the fuel cell from pollutants (> 100 µm). An ion exchanger ensures that the coolant maintains a low degree of conductivity (< 5 µS/cm).

Different coolants are used in the coolant circuits. While a special coolant is provided in the high temperature circuit, a standard coolant is used in the low-temperature circuits.

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Only coolant that is specially suitable for fuel cell vehicles may be used. Refilling with commercially available coolants or water causes irreparable damage to the fuel cell.

Please read the notes about the fuel cell coolant: AH06.50-P-0001-01RFW

i
Extensive information on the fuel cell system and warnings when the fill level falls below that required are shown on the instrument cluster (A1).

- -

High temperature cooling circuit

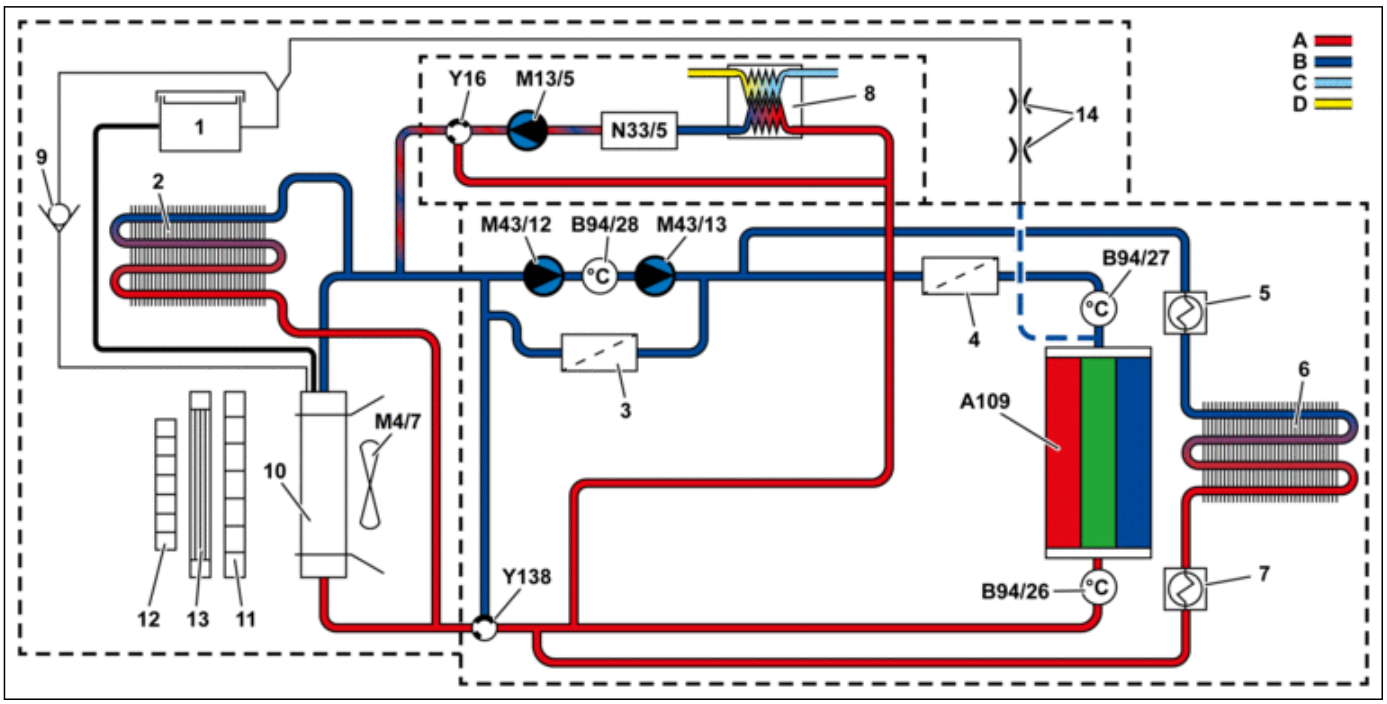
The fuel cell operates in a temperature range of approx. 80° C and is therefore cooled by a separate high-temperature cooling circuit. The PreCon function (pre-entry climate control) enables preheating of the fuel cell. A cold start is possible down to -25° C.

The high-temperature cooling circuit is regulated by the powertrain control unit (N127). The coolant pressure in the cooling circuit is temperature-dependent and also depends on the speed of the fuel cell coolant pumps.

The temperature of the high-temperature cooling circuit is recorded via the following temperature sensors:

- High temperature coolant circuit temperature sensor 1 (B94/28)
- Cathode outlet temperature sensor (B94/26)
- Cathode inlet temperature sensor (B94/27)

The coolant level in the expansion reservoir of the high-temperature cooling circuit is recorded by the high-temperature circuit coolant fill level sensor (S41/1).



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Schematic diagram of high-temperature cooling circuit

1	*Expansion reservoir for high-temperature cooling circuit*	*11*	*Radiator low-temperature circuit 1*	*M43/12*	*Left fuel cell cooling coolant pump*
2	*Radiator*	*12*	*Low-temperature circuit 2 cooler*	*M43/13*	*Center fuel cell cooling coolant pump*
3	*Ion exchanger*	*13*	*Condenser*	*N33/5*	*High-voltage PTC heater*
4	*Particulate filter*	*14*	*Restrictors*	*Y16*	*Stationary heater switchover valve*
5	*Cathode water separator*	*A109*	*Fuel cell stack*	*Y138*	*High temperature coolant circuit regulation valve 1*
6	*Fuel cell cooler*	*B94/26*	*Cathode outlet temperature sensor*	*A*	*Temperature high*
7	*Hydrogen preheater*	*B94/27*	*Cathode inlet temperature sensor*	*B*	*Temperature high to medium*
8	*Heat exchanger*	*B94/28*	*High temperature coolant circuit temperature sensor 1*	*C*	*Temperature medium*
9	*Check valve*	*M4/7*	*Fan motor*	*D*	*Temperature low*
10	*Cooler for high-temperature cooling circuit*	*M13/5*	*Coolant circulation pump*		

Low-temperature circuit 1

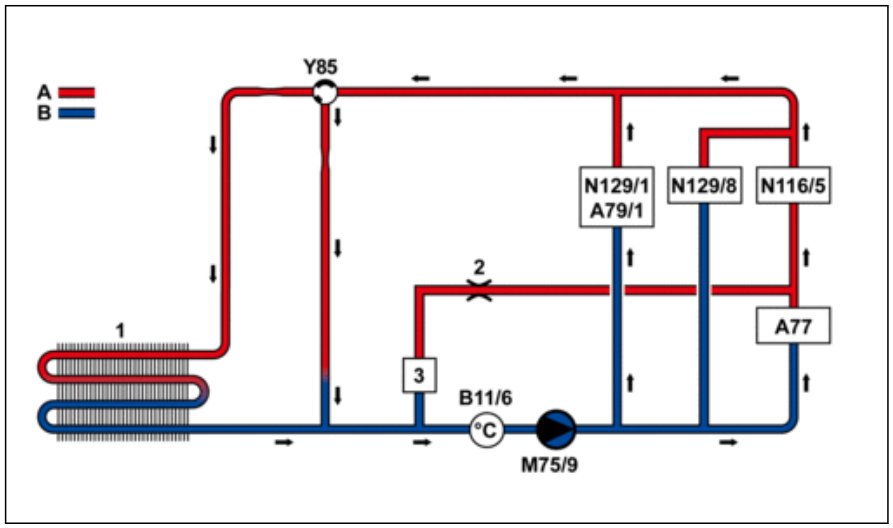
Low-temperature circuit 1 cools the electric machine and the DC/DC converter, the PDU (Power Distribution Unit) and the exhaust air turbocharger of the fuel cell system..

Low-temperature circuit 1 is regulated by the powertrain control unit. It evaluates the data from the low-temperature coolant circuit 2 temperature sensor and actuates the rear electric machine coolant pump where necessary.

The power electronics are also flowed through for low outside temperature, always with a minimum coolant volume flow (dependent on the coolant temperature).

Schematic diagram of low-temperature circuit 1

1	*Radiator low-temperature circuit 1*
2	*2-mm restrictor*
3	*Expansion reservoir for low-temperature circuit 1*
A77	*Exhaust air turbocharger*
A79/1	*Electric machine*
B11/6	*Low-temperature coolant circuit 1 temperature sensor*
M75/9	*Rear electric machine coolant pump*
N116/5	*Battery management system control unit*
N129/1	*Power electronics control unit*
N129/8	*Fuel cell DC/DC converter control unit*
Y85	*Low temperature coolant circuit 1 regulation valve 1*
A	*Temperature high*
B	*Temperature high to medium*



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Low-temperature circuit 2

Low-temperature circuit 2 cools the high-voltage battery, the DC/DC converter and the alternating current charger for high-voltage batteries.

Low-temperature circuit 2 is regulated by the powertrain control unit. It evaluates the data from the low-temperature coolant circuit 2 temperature sensor and actuates the high-voltage battery coolant pump where necessary. According

to the ambient temperature waste heat from the high-voltage battery is led away over the low-temperature circuit 2 cooler or over the heat exchanger attached to the refrigerant circuit. Regulation of low-temperature circuit 2 takes place over actuation of the high-voltage battery cooling switchover valve.

The heat exchanger cools the coolant by means of the refrigerant injected into the heat exchanger and evaporated. The cooled down coolant is subsequently available to low-temperature circuit 2. When the high-voltage battery is being charged, low-temperature circuit switchover valve 2 is switched in the direction of the alternating current charger for the high-voltage battery and DC/DC converter control unit in moderate temperatures. The waste heat from the electronics is dissipated via the low-temperature circuit 2 cooler.

At low temperatures of the high-voltage battery, the coolant is led over the heat exchanger blocked off from the high-voltage battery cooling expansion valve. In this case, the heat capacity of the high-voltage battery is used to cool the electronics of the alternating current charger for high-voltage batteries and of the DC/DC converter control unit.

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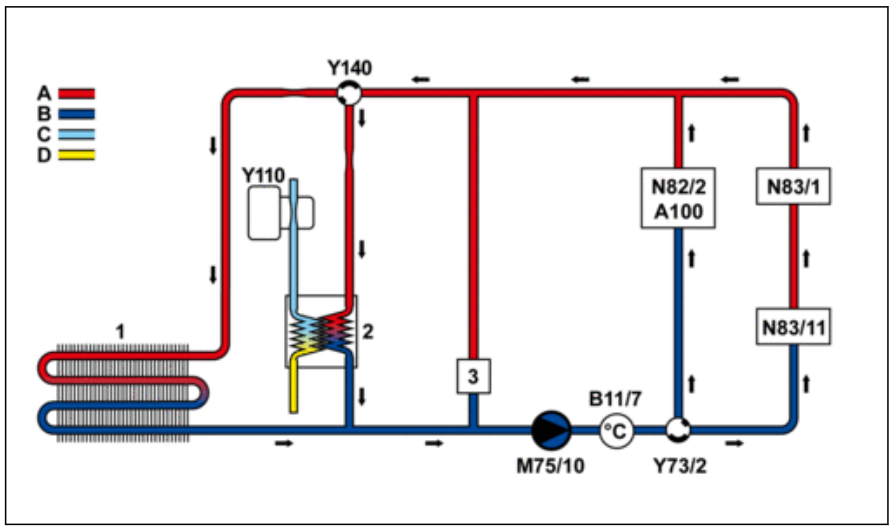
The energy management module in the powertrain control unit controls the energy flow of the fuel cell system. It is, in relation to the electric variables, the interface to the battery management system control units, power electronics and to the electric refrigerant compressor.

If the enable is awarded by the energy management the powertrain control unit makes the request to the climate control control unit (N22/1) via the CAN network for actuation of the electric refrigerant compressor. The air conditioning control unit then actuates the electric refrigerant compressor via the climate control LIN 2 (LIN B8-2). The high-voltage battery cooling expansion valve is opened by the battery management system control unit and the refrigerant flows through the heat exchanger. In this way, thermal energy is extracted from the low-temperature circuit 2.

The cooling output is primarily dependent on the level of actuation to the electric refrigerant compressor. In idle and during an automatic engine stop, the output of the electric refrigerant compressor is limited to a maximum of approx. 2 kW. If the high-voltage battery's state of charge is very low, the output of the electric refrigerant compressor is regulated down to 0 kW.

Schematic diagram of low-temperature circuit 2

1	*Low-temperature circuit 2 cooler*
2	*Heat exchanger*
3	*Low-temperature circuit 2 expansion reservoir*
A100	*High-voltage battery module*
B11/7	*Low-temperature coolant circuit 2 temperature sensor*
M75/10	*High-voltage battery coolant pump*
N82/2	*Battery management system control unit*
N83/1	*DC/DC converter control unit*
N83/11	*Alternating current charger for high-voltage battery*
Y73/2	*Low-temperature circuit switchover valve 2*
Y110	*High-voltage battery cooling system expansion valve*
Y140	*High-voltage battery cooling system switchover valve*
A	*Coolant warmed*
B	*Coolant cooled*
C	*Refrigerant (high pressure, liquid)*
D	*Refrigerant (low pressure, gaseous)*



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Overpressure protection function

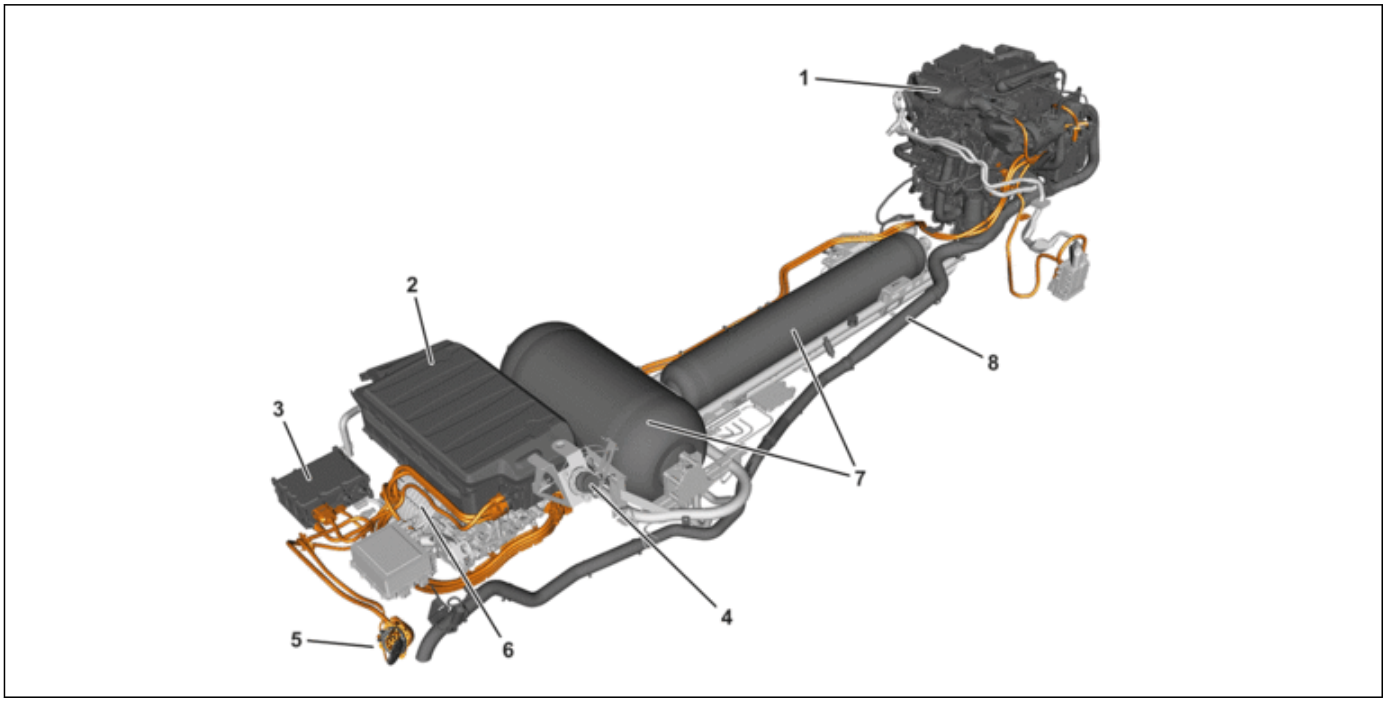
Air or hydrogen can enter the cooling circuit through leaks in the fuel cell stack, the charge air cooler or the hydrogen preheater. The gas input is dissipated to the high-temperature cooling circuit expansion reservoir via a bleed line and discharged into the atmosphere in a defined way by means of an overpressure valve. The valve opens at an overpressure > 0.8 bar. The escaping gas/air mix is diverted to the engine compartment.

SN00.00-P-0080-13D	Drive		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

With the GLC F-CELL, an innovative type of drive is added to model series 253. A completely new fuel cell system is combined with a lithium-ion high-voltage battery in the rear area. The high-voltage battery can be charged either via the vehicle's alternating current charger for high-voltage batteries from the external energy grid or receives the electrical power via cold combustion in the fuel cell. The rear wheel of the GLC F-CELL Type 253 is powered exclusively via the electric machine.

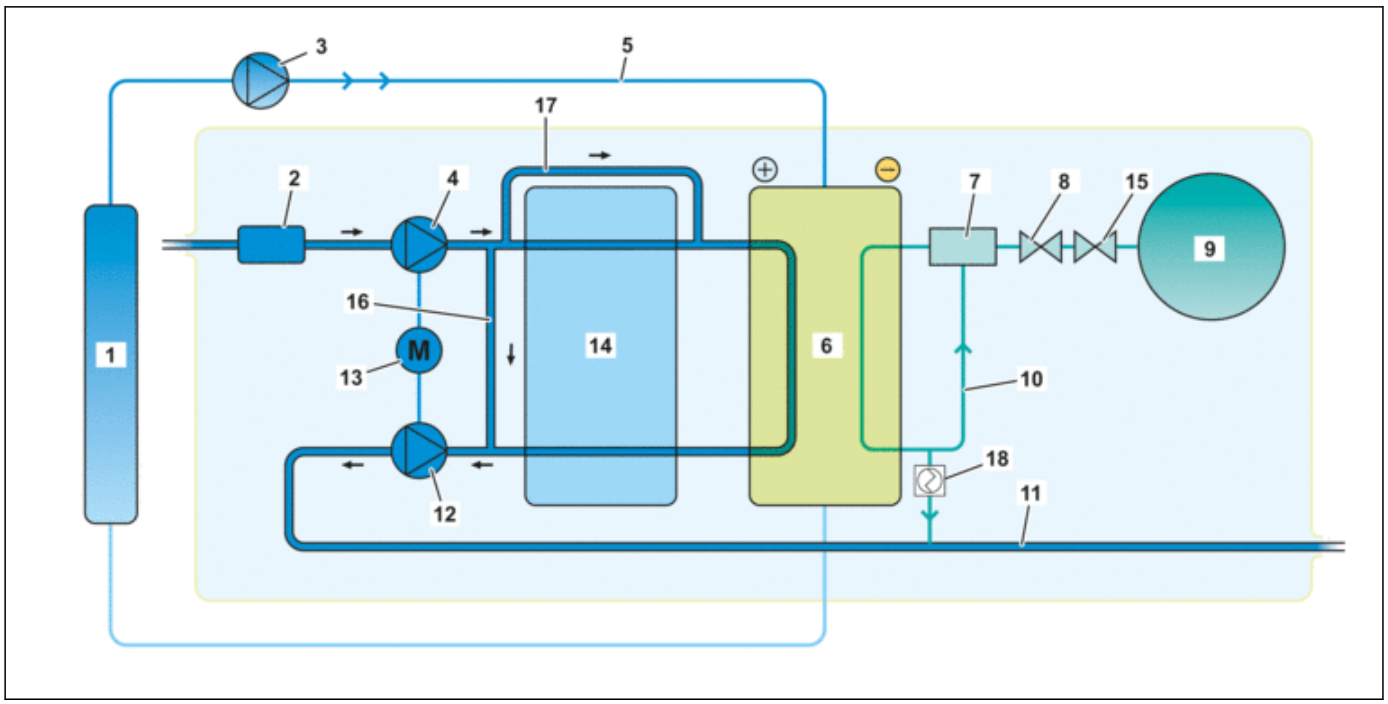
Compared with the B-Class F-Cell already owned by the customer, the entire drive system offers around 40% more power. The fuel cell system is around 30% more compact than before. This is therefore the first time it is accommodated completely in the engine compartment. It is installed on the usual suspension points, just like a conventional engine. And last but not least, the use platinum in the fuel cell has been reduced by 90%.



P06.00-2064-79

Powertrain overview

1 Fuel cell unit
2 Lithium-ion high-voltage battery
3 Alternating current charger for high-voltage battery
4 Contact plate on vehicle for fuel pump with hydrogen filling station communication module
5 Vehicle socket
6 Electric machine with single stage transmission
7 Hydrogen tanks
8 Air extraction system



P06.00-2061-79

Overview of fuel cell system

1 Radiator package
2 Air inlet system
3 Coolant pump fuel cell
4 Compressor supply air
5 Cooling circuit
6 Fuel cell module
7 Jet pump
8 Pressure regulating valve 1
9 Hydrogen tank
10 Hydrogen circuit
11 Exhaust system
12 Exhaust air turbine
13 Drive motor of exhaust air turbocharger
14 Humidifier module
15 Tank system shutoff valve
16 System bypass
17 Humidifier bypass
18 Anode separator with purge/drain valve and discharge to the exhaust system

Fuel cell system

In the fuel cell, an electrical DC voltage is generated via a chemical reaction (cold combustion) between the hydrogen and the oxygen from ambient air. The direct voltage generates supplies energy to the powertrain and the internal components of the fuel cell system (e.g. the exhaust air turbocharger). In the startup phase and in limp-home mode, solely the lithium-ion high-voltage battery provides the electrical power for the drive system. During normal driving it provides additional energy for acceleration and compensates the sluggish reaction of the fuel cell to increased energy requirements. Since the GLC F-CELL Type 253 does not have an alternator, the high voltage electrical system also supports the 12 V on-board electrical system and charges the 12 V battery as required. The power supply of the 12 V consumers is thereby ensured.

The fuel cell system has a cold start ability down to -25° C and generates a maximum continuous output of 63 kW. The direct voltage generated lies between 250 V and 430 V during normal driving.

The fuel cell system has a compact structure and consists of the following components:

- Fuel cell module (stack module)
- Air module
- Humidifier module
- Ion exchanger
- DC/DC converter for fuel cell
- Fuel cell control unit

The controlling and monitoring of all procedures in the fuel cell system is performed by the fuel cell management system control unit (N116/5) and the fuel cell control unit

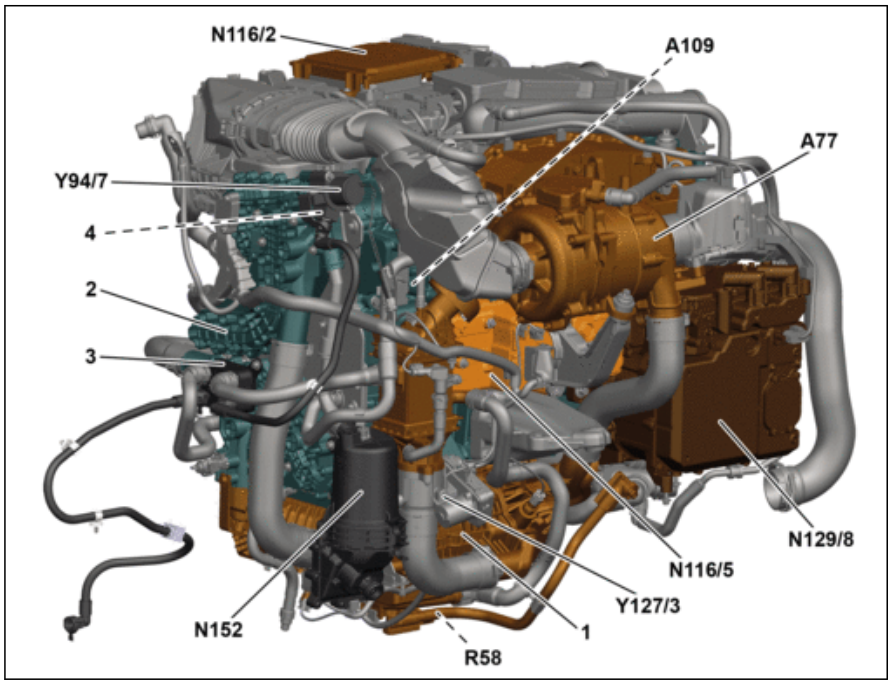
(N116/2). The fuel cell DC/DC converter control unit (N129/8) transfers the high voltage direct voltage generated in the fuel cell stack to the (high voltage) voltage level of the battery.

Engine compartment with covered fuel cell

P01.00-3777-76

Overview of fuel cell system components

1	*Air processing unit*
2	*Media distributor plate*
3	*Hydrogen preheater*
4	*Jet pump*
A77	*Exhaust air turbocharger*
A109	*Fuel cell stack*
N116/2	*Fuel cell control unit*
N116/5	*Fuel cell management system control unit*
N129/8	*Fuel cell DC/DC converter control unit*
N152	*Water separator*
R58	*Drain hose heating element 1*
Y94/7	*Pressure regulating valve 1*



P06.00-2058-76

Fuel cell stack

In the fuel cell stack, the humidified, compressed ambient air is fed to the cathode side and hydrogen to the anode and electrical power is generated.

Here, water is produced as a product of the reaction through the release of heat. The waste heat is discharged into the vehicle radiator via the cooling liquid circuit. During cold starts, the waste heat from the fuel cell stack is used to support the heating of the components in the fuel cell system.

The media distributor plate (2) is the interface at the fuel cell stack for air and hydrogen as well as high-temperature coolant. The jet pump (4) for the hydrogen supply is integrated in the media distributor plate.

The housing of the fuel cell stack guarantees the electromagnetic and mechanical protection of the fuel cell as well as protection against contact with and the ingress of water and dirt. In addition, the housing ensures the controlled circulation of air around the fuel cell to ventilate the housing.

Air module with exhaust air turbocharger

To supply the fuel cell stack with oxygen, ambient air is sucked in via an air filter and muffler by an electrically driven exhaust air turbocharger. In the exhaust air turbocharger, the ambient air is compressed and fed into the fuel cell stack via the air processing unit.

The exhaust air turbocharger performs the following tasks in the fuel cell system:

- Supplying the fuel cell stack with oxygen from the ambient air
- Reducing the HV energy required by the compressor
- Sending the engine speed of the compressor and the HV power supply of the exhaust air turbocharger via CAN to support the overvoltage protection and the energy management of the system.

Humidifier module

In order to achieve optimum humidification of the fuel cell stack and the diaphragm, a humidifier module has been installed upstream and downstream of the fuel cell stack. It guides water vapor from the exhaust air side to the fresh air side. The amount, pressure, temperature and humidity of the air supply vary depending on the operating status of the fuel cell. The degree of humidification can be controlled by the humidifier module bypass flap actuator on the fresh air side.

Ion exchanger

Since the fuel cell depends on a coolant with minimum conductivity, the ions are filtered out of the fluid. This job is performed by the ion exchanger. The ion exchanger is located directly above the fuel cell stack in such a way that it a maximum quantity of the coolant flowing back flows around it.

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The cartridge of the ion exchanger is subject to the intervals of the vehicle-specific additional maintenance work.

Transmission

The transmission consists of a 1-stage planetary gear system with a fixed gear ratio to the drive wheels, an integrated bevel gear differential and park pawl. The transmission is directly installed on the electric machine to the left (relative to the direction of travel). Due to the characteristics of the electric machine, no clutch is required.

1 *Electric machine*
2 *Power electronics*
3 *Transmission*

P08.30-2145-76

DIRECT SELECT

The DIRECT SELECT lever includes the following lever positions:

- "R", reverse gear
- "N", neutral and start position (no power transmission, vehicle can move freely)
- "D", 1 forward gear is available.

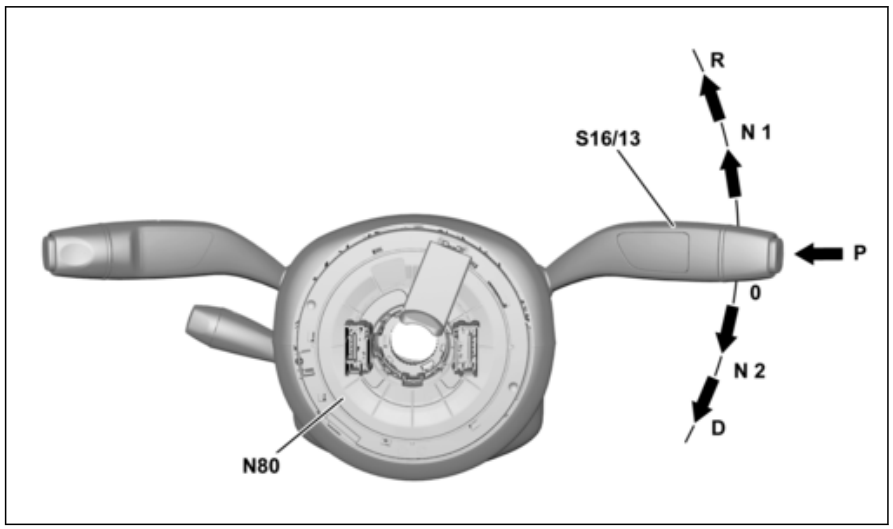
The selector lever has different positions and power levels:

- Park position
- Shift to 'N', a power level is crossed.
- Shift to "D" or "R", a higher power level is crossed.

The park pawl can be requested from a vehicle speed < 7 km/h.

View of steering column tube module from front

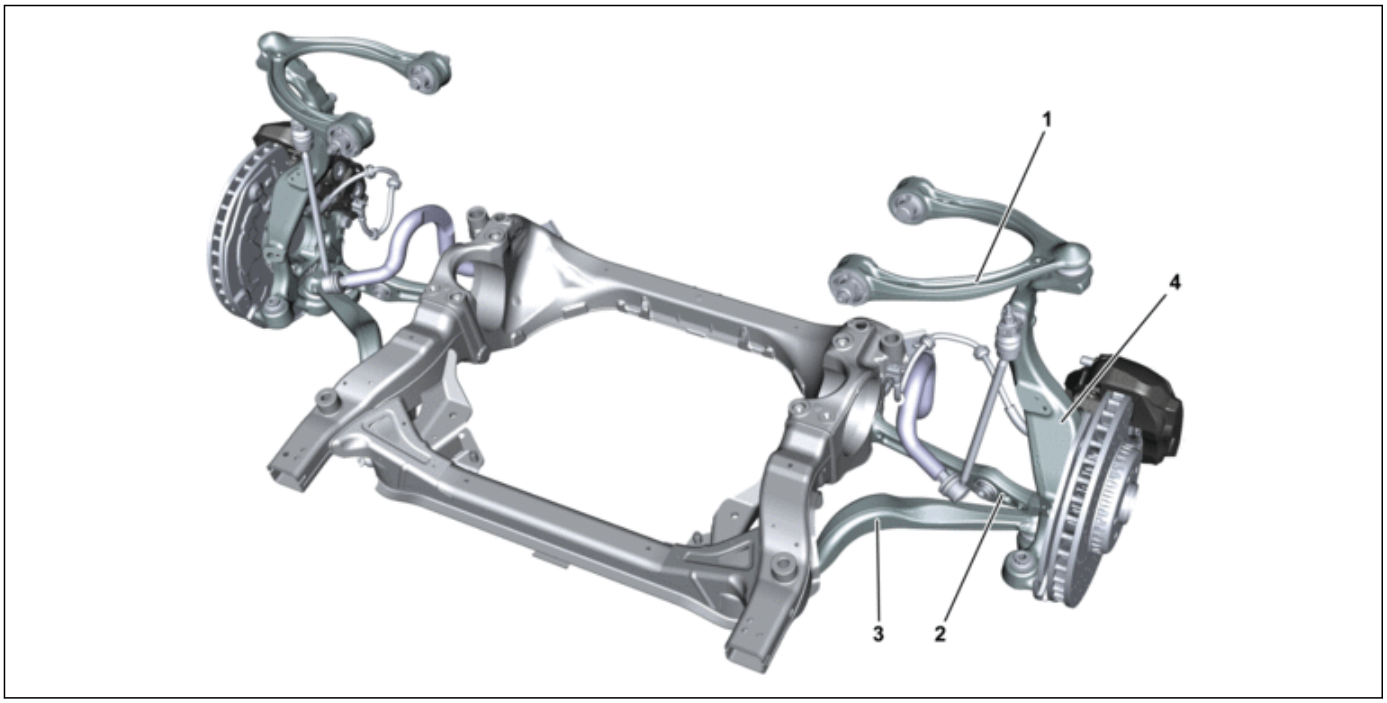
0	*Park position*
D	*Drive*
P	*Park lock and start position*
R	*Reverse gear*
N1	*Neutral position 1*
N2	*Neutral position 2*
N80	*Steering column module control unit*
S16/13	*DIRECT SELECT lever*



P54.21-3991-05

SN00.00-P-0080-02D	Suspension		

Model 253.99
with code 9O1 (Fuel cell pre-installation)



P33.10-2546-79

A 4-link front axle is shown

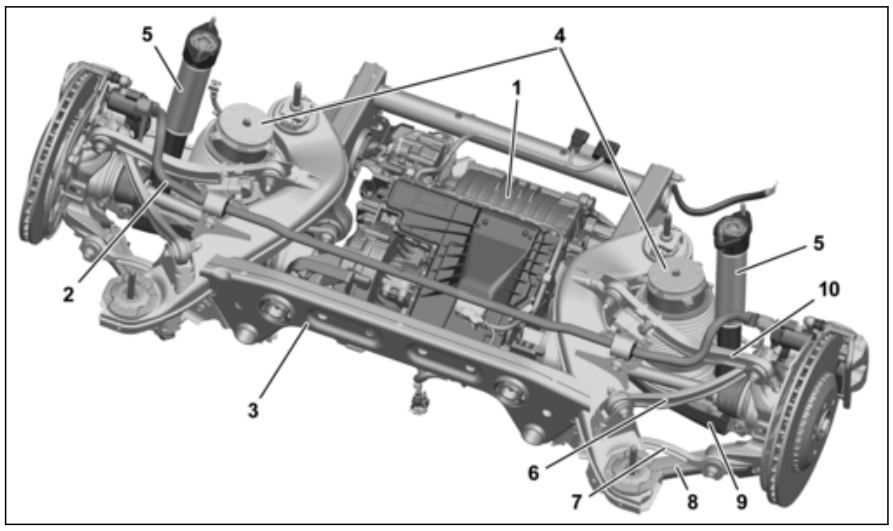
1 Upper transverse control arm
2 Spring control arm
3 Strut rod
4 Steering knuckle

Front axle

The front suspension is from the current model series 253 and is designed as a 4-link front axle. The front axle is not driven. The GLC F-CELL Type 253 is not available with 4MATIC.

A 5-link rear axle is shown

1 Electric drive unit
2 Stabilizer bar
3 Rear axle carrier
4 Air suspensions
5 Rear axle shock absorber
6 Strut rod
7 Tie rod
8 Thrust arm
9 Spring control arm
10 Camber strut



P35.10-2556-05

Rear axle

The rear axle is from the current model series 253 and is designed as a 5-link rear axle.

Suspension and damping

The GLC F-CELL Type 253 receives, as standard, a conventional steel suspension on the front axle and a 1-chamber air suspension with integrated level control on the rear axle..

Electronic rear axle level control

The electronic rear-axle level control monitors the rear axle level and is created with 2 air suspension bellows. The objective of electronic rear-axle level control is to keep the rear-axle level constant irrespective of the load status and any driving-dynamics related pitch motion of the vehicle.

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On vehicles with electronic rear-axle level control, the same component parts (AIR BODY CONTROL relay, AIR BODY CONTROL compressor and AIR BODY CONTROL pressure relief valve) are used as on vehicles with Code 489 (AIR BODY CONTROL).

Brakes

The GLC F-CELL Type 253 receives the brake system from the current model series 253 with internally ventilates and punched compound brake disks.

SN47.60-P-0000-01D	Fuel system		

Model 253.99 with engine 780
with code 9O1 (Fuel cell pre-installation)

Hydrogen tanks in general

The hydrogen tanks are used to store compressed hydrogen gas (CHG).

The hydrogen system is accommodated on the underbody directly in front of the rear axle. The pressure tank outlet and the hydrogen lines between the pressure tanks are located on the right side of the vehicle in the direction of travel. The fueling connector is located on the right side of the vehicle (fuel filler flap). The fuel system is controlled and monitored by the fuel tank control unit (N3/19).

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In Europe, vehicles are fueled using 700 bar technology as standard.

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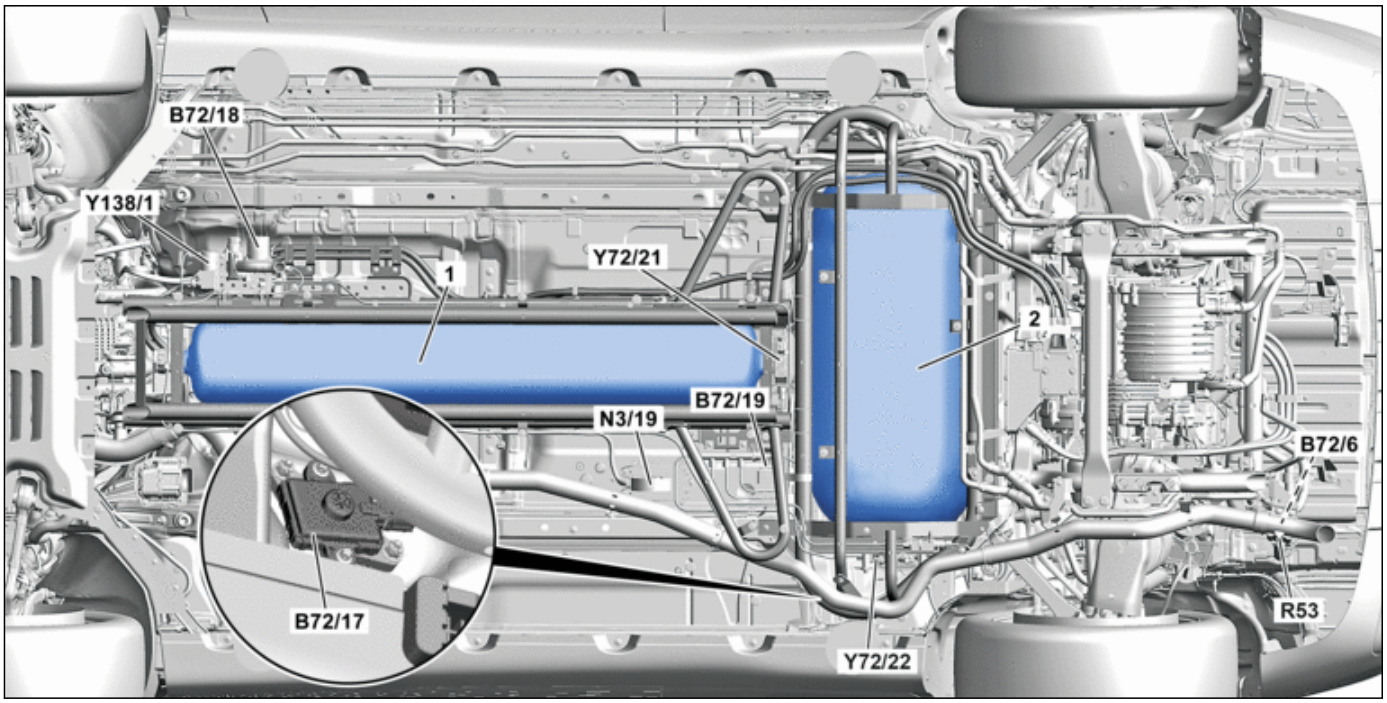
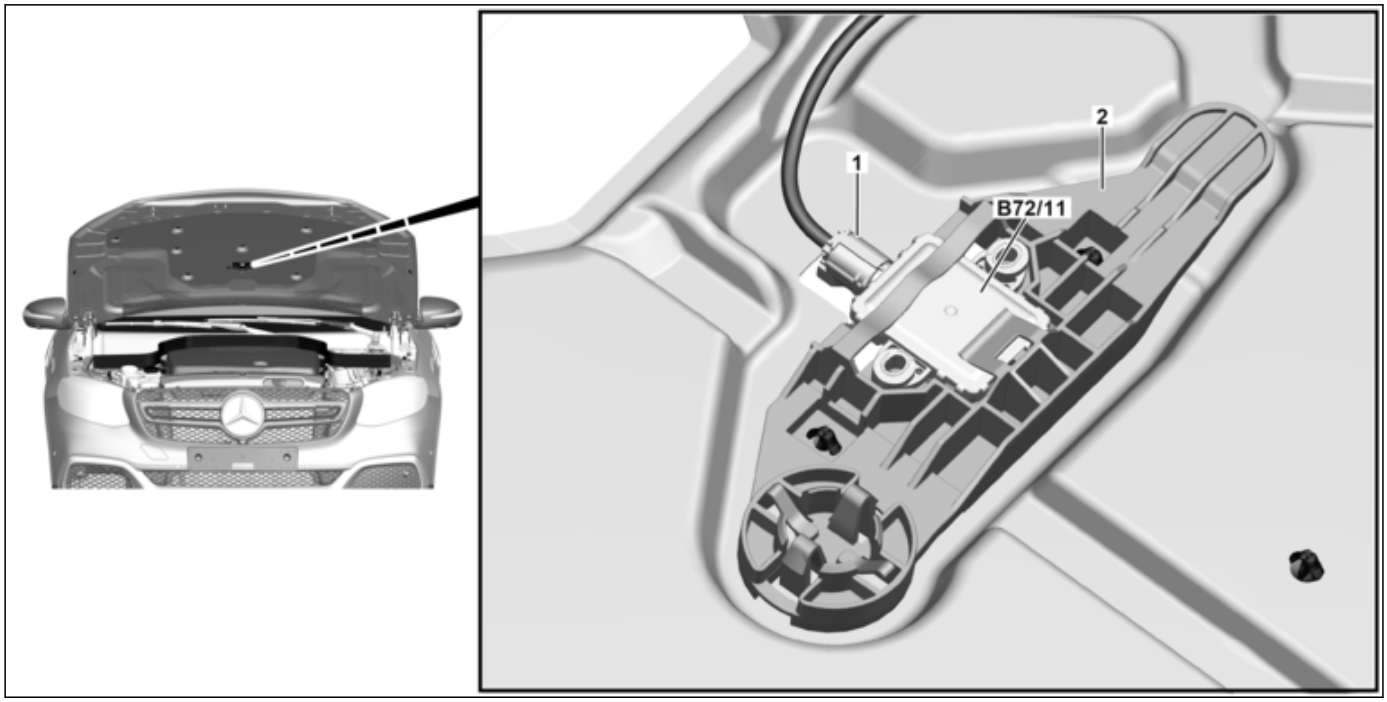
Extensive information on the hydrogen system, including the fill level, is displayed on the instrument cluster (A1).



P47.60-2094-79

Overview of hydrogen system components

1	*Hydrogen tank in the transmission tunnel*	*N3/19*	*Fuel tank control unit*
2	*Hydrogen tank above the rear axle*	*R53*	*Hydrogen sensor heating element 1*
B72/6	*Hydrogen sensor 1*	*Y72/21*	*Fuel tank valve 1 (longitudinal tank)*
B72/17	*Hydrogen sensor 2*	*Y72/22*	*Fuel tank valve 2 (transverse tank)*
B72/18	*Mean pressure sensor*	*Y138/1*	*Pressure regulating unit with shutoff valve*
B72/19	*High pressure sensor*		



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B72/11 Hydrogen sensor 3

Hydrogen tank

The hydrogen tanks of the GLC F-CELL of one longitudinally installed and one transversely installed tank with a plastic liner and a full wrap made of carbon-fiber.

The hydrogen tanks are used to store compressed hydrogen gas. At 15 °C, the maximum operating pressure when the vehicle is refueled is 700 bar. This corresponds to an operating pressure of approx. 875 bar at a temperature of +85 °C. The fueling time of both hydrogen tanks is approx. 3 minutes.

The cycle service life is approx. 5,000 filling and emptying cycles. The operating temperature range (filling temperature and ambient temperature) is between -40 °C and +85 °C.

The hydrogen system weighs approx. 111 kg and has a usable tank capacity of 4.4 kg of hydrogen.

Hydrogen lines

The hydrogen lines are used for filling and emptying the hydrogen tanks, for supplying the fuel cell system with hydrogen and for blowing hydrogen out into the surroundings in the event of a fault. On the end of the filling line is a check valve.

Fuel filter

The fuel filters filter particles larger than 10 micrometers, both during fueling and during operation.

PRESSURE CONTROL

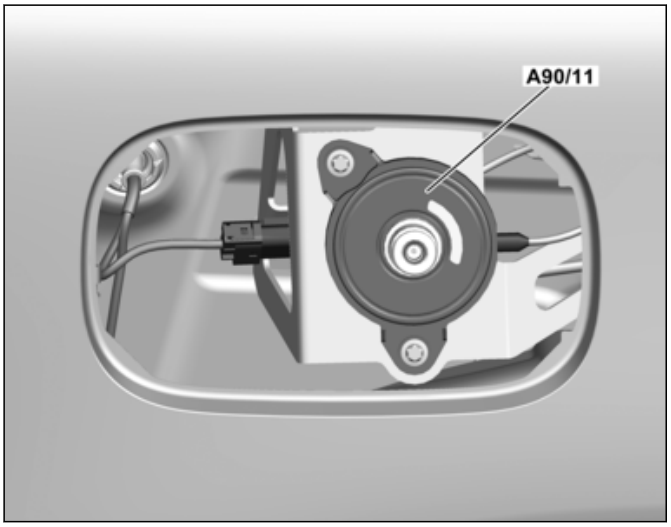
The pressure regulating unit with shutoff valve (Y138/1) regulates the pressure of the hydrogen system. Shutoff valve isolates the hydrogen system from the fuel cell system while the vehicle is not in operation. The shutoff valve opens when the vehicle is in operation and closes when the vehicle is switched off.

The pressure regulating unit is attached to the end of the hydrogen tank (longitudinal tank) on the reinforcing frame. It is connected to the hydrogen tanks and the filling line with check valve via the high-pressure fuel circuit gas distributor. The CHG removed from the hydrogen tanks is reduced to a pressure between 9.0 bar (g) and 14.0 bar (g) by the pressure regulating unit with shutoff valve. The reduced compressed hydrogen gas then flows to the fuel cell system via the shutoff valve and the feed lines.

Hydrogen filling station communication module

The hydrogen filling station communication module is an optical infrared interface between the vehicle and the hydrogen filling station. In order to detect fueling operations, the hydrogen filling station communication module also transmits the signal of the reed contact that is integrated in the dust cap.

A90/11 *Hydrogen filling station communication module*



P47.60-2088-11

Tank system monitoring

Overpressure protection

In the event of a malfunction in the pressure regulating unit, a pressure relief valve and the shutoff valve protect the mean pressure system and the fuel cell connected behind it from damage. If the pressure rises to 17 bar, the shutoff valve closes. If there is a further pressure rise, the hydrogen escapes via a vent line on the pressure relief valve. This takes place once a pressure of 20 (± 0.8) bar has been reached. The overpressure is detected, via the pressure sensor for mean pressure (B72/18) by the fuel tank control unit (N319).

Pipe rupture protection

Thanks to pipe rupture protection in the valve units, the hydrogen system is protected from abrupt emptying of the hydrogen tanks in the event of a pipe rupture. The hydrogen flows out of the hydrogen tanks through the pipe rupture protection in the valve units towards the pressure regulating unit. If the hydrogen lines on the high-pressure side are damaged, hydrogen will escape. An increased flow volume ensues. Due to the increased speed of the gas, the piston in the pipe rupture protection presses on the seat against the spring force. As soon as the gas in the hydrogen tank has reached the same pressure level as in the line, the piston automatically resets itself to the initial position.

Pressure and temperature measurement in the hydrogen system

The fuel tank control unit records the actual gas temperature in the tanks via the temperature sensors integrated in the valve units of the hydrogen tanks. The gas pressure in the hydrogen tanks is recorded by the high-pressure sensor (B72/19) for the high-pressure fuel circuit gas distributor. The valve units of the hydrogen tanks must be opened at the same time. When the valve units of the hydrogen tanks are closed, the gas supply within the valve unit is blocked. The high-pressure sensor then measures the pressure in the high-pressure lines. The system pressure in the supply line to the fuel cell is measured by the fuel tank control unit via the pressure sensor for mean pressure (B72/18).

The high-pressure sensor and the temperature sensors in the valve units of the tanks are used to calculate the contents of the hydrogen tanks and to monitor the hydrogen system. The temperatures in the tanks are also monitored during the fueling process. As soon as the maximum gas temperature in the tanks rises above 90 °C, the hazard warning lamps are activated. If the gas temperature in the tanks rises to above 85 °C, the fuel tank control unit sends an "Abort Refuel" signal to the fuel station. During refueling with communication, the fuel station will end fueling. The fueling process is also stopped when the hydrogen tanks are full (fill level = 100 %) or the pressure has risen to 875 bar. If the pressure rises above 105 % or 875 bar due to a malfunction at the fuel station, an "Abort Refuel" signal is also sent to the fuel station. The fueling process must be manually aborted without delay.

Electromagnetic shutoff function

The fuel tank valve 1 shutoff valve (longitudinal tank) (Y72/21) and the fuel tank valve 2 (transverse tank) (Y72/22) control the sampling of hydrogen from the respective hydrogen tank. In an emergency situation (crash event, hydrogen alarm), the voltage is removed from the shutoff valves and they are closed as a result.

Measurement of the hydrogen concentration

While hydrogen sensor 2 (B72/17) measures the hydrogen concentration in the underbody, hydrogen sensor 3 (B72/11) measures this via the fuel cell. In addition, hydrogen sensor 1 (B72/6) is installed in the air extraction system; the job of this sensor is to record excessively high exhaust air concentrations. If hydrogen is detected, the fuel tank control unit initiates different safety functions depending on the warning threshold (level of the hydrogen concentration):

- Entry in the fault memory
- Illumination of the hydrogen indicator and warning lamp
- Short beep and red display message "Stop Vehicle, Engine Off"
- Forced ventilation of the underbody though actuation of the fan
- Shutdown of the fuel cell system
- Fueling aborted through the fuel tank control unit
- Restart not permitted

Start-off protection during the fueling process

The refueling intention detection is triggered by the removal of the dust cap from the filling nozzle. The fuel tank control unit (N3/19) prevents the start enable of the vehicle as soon as an increase in the fill level of more than 5% is detected.

The fuel tank control unit monitors the hydrogen pressure and the temperature during the fueling process. The hydrogen filling station communication module receives the data from the fuel tank control unit and transmits it to the hydrogen filling station via the infrared transmitting diode. The fuel tank control unit and the hydrogen filling station communication module exchange a fueling protocol between themselves.

Safety in the event of overheating

Overheating protection in the valve units of the hydrogen tanks prevents the tanks from rupturing under the effect of heat. At temperatures above 110 (± 5) °C, the overheating protection opens permanently and allows a controlled escape of the entire gas content via the drain line.

Valve diagnostics

The valve diagnostics checks that the two valve units of the hydrogen tanks open and close properly. It also monitors the leak tightness of the high-pressure lines. The opening and closing of the valve units is checked once after the fuel cell system has started up. The leak tightness of the high-pressure lines is always checked after an extended non-operational time (> 2 h) at the subsequent engine start.

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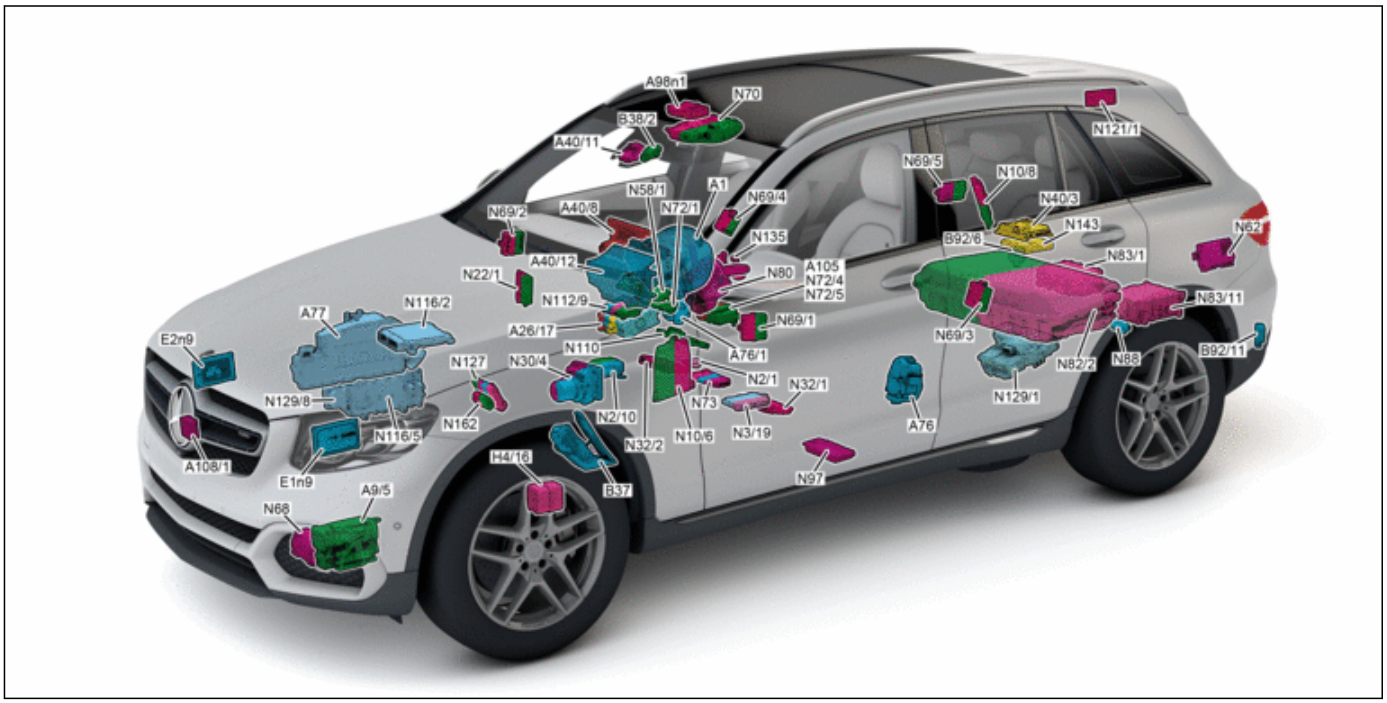
The valve diagnosis and the leak test are generally performed during shutdown as well.

SN00.00-P-0080-12D	Networking, on-board electrical system		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Networking

The electrical on-board electrical system of the GLC F-CELL Type 253 builds on the networking architecture of the C-Class Type 205 facelift.



P00.19-6806-79

Drive train CAN (CAN C1)

	Control unit	Additional information
B37	Accelerator pedal sensor	-
N127	Powertrain control unit	-
N129/1	Power electronics control unit	-

User interface CAN (CAN HMI)

	Control unit	Additional information
A1	Instrument cluster	-
A26/17	Head unit	-
A40/12	Head-up display	-
A76	Left front reversible emergency tensioning retractor	with CODE 299 (PRE-SAFE® system)
A76/1	Right front reversible emergency tensioning retractor	with CODE 299 (PRE-SAFE® system)
N2/10	Supplemental restraint system control unit	-
N73	Electronic ignition switch control unit	-
N88	Tire pressure monitor control unit	With code 475 (Tire pressure monitor)

Diagnostic CAN (CAN D)

	Control unit	Additional information
N73	Electronic ignition switch control unit	-
N112/9	HERMES control unit	With code 362 (HERMES LTE)

Hybrid CAN (CAN L)

	Control unit	Additional information
H4/16	Sound generator	-
N82/2	Battery management system control unit	-
N83/1	DC/DC converter control unit	-
N83/11	Alternating current charger for high-voltage battery	-
N112/9	HERMES control unit	-
N127	Powertrain control unit	-

Hydrogen supply CAN (CAN P)

	Control unit	Additional information
B72/6	Hydrogen sensor 1	-
B72/11	Hydrogen sensor 2	-
B72/17	Hydrogen sensor 3	-
N2/1	High-voltage crash sensor control unit	-
N3/19	Fuel tank control unit	-

Fuel cell CAN (CAN FC)

	Control unit	Additional information
A77	Exhaust air turbocharger	-
N3/19	Fuel tank control unit	-
N116/2	Fuel cell control unit	-
N116/5	Fuel cell management system control unit	-
N127	Powertrain control unit	-
N129/8	Fuel cell DC/DC converter control unit	-

Interior CAN (CAN B)

	Control unit	Additional information
A98	Panoramic sliding roof control module	With code 413 (Panoramic sliding sunroof)
N10/6	Front SAM control unit	-
N10/8	Rear SAM control unit	-
N22/1	Climate control control unit	-
N32/1	Driver seat control unit	With CODE 275 (Memory package)
N32/2	Front passenger seat control unit	With CODE 275 (Memory package)
N69/1	Left front door control unit	-
N69/2	Right front door control unit	-
N69/3	Left rear door control unit	-
N69/4	Right rear door control unit	-
N69/5	KEYLESS-GO control unit	-
N70	Overhead control panel control unit	-
N73	Electronic ignition switch control unit	-
N121/1	Tailgate control control unit	With CODE 890 (EASY-PACK liftgate)
N162	Ambiance illumination control unit	With CODE 877 (Ambiance illumination)

Steering wheel CAN (CAN LR)

	Control unit	Additional information
N80	Steering column module control unit	-
N135	Steering wheel electronics	-

Periphery CAN (CAN PER)

	Control unit	Additional information
B92/6	Right outer rear bumper integrated radar sensor	With CODE 234 (Blind spot assist)
B92/11	Left outer rear bumper integrated radar sensor	With CODE 234 (Blind spot assist)
E1	Left front lamp unit	-
E2	Right front lamp unit	-
N73	Electronic ignition switch control unit	-
N127	Powertrain control unit	-

Telematics CAN (CAN A)

	Control unit	Additional information
A26/17	Head unit	-
A40/8	Audio/COMAND display	-
A105	Touchpad	-

Suspension FlexRay (Flex E)

	Control unit	Additional information
A40/11	Mono multifunction camera	-
A108/1	Active Distance Assist DISTRONIC electric controller unit	-
N30/4	Electronic Stability Program control unit	-
N62	Parking system control unit	With CODE 235 (Active park assist)
N68	Electrical power steering control unit	-
N73	Electronic ignition switch control unit	-
N80	Steering column module control unit	-
N97	Rear axle electronic level control control unit	-
N127	Powertrain control unit	-

Media Oriented System Transport (MOST)

	Control unit	Additional information
A26/17	Head unit	-
N40/3	Sound system amplifier control unit	With code 810 (sound system), only available in Japan
N143	TV tuner control unit	With code 865 (TV tuner), only available in Japan

Seat occupied recognition LIN (LIN E2)

	Control unit	Additional information
N2/10	Supplemental restraint system control unit	-
N110	Weight Sensing System (WSS) control unit	With CODE U10 (Automatic front passenger airbag shutoff)
N112/9	HERMES control unit	With code 362 (HERMES LTE)

Rain/light sensor LIN (LIN B16)

	Control unit	Additional information
B38/2	Rain/light sensor with additional functions	-
N10/6	Front SAM control unit	-

Front air conditioning control LIN (LIN B8-1)

	Control unit	Additional information
M16/11	Left A-pillar air distribution actuator motor	-
M16/12	Right A-pillar air distribution actuator motor	-
N22/1	Climate control control unit	-

Climate control LIN 2 (LIN B8-2)

	Control unit	Additional information
A9/5	Electric refrigerant compressor	-
A32	AC housing	-
N18/9	Driver side air vent ionizer	With code P21 (AIR-BALANCE package)
N22/1	Climate control control unit	-
N59	Perfume atomizer generator	With code P21 (AIR-BALANCE package)

A/C operating unit LIN (LIN B8-3)

	Control unit	Additional information
N22/1	Climate control control unit	-
N58/1	Climate control operating unit	-

Heater LIN (LIN B28)

	Control unit	Additional information
N10/8	Rear SAM control unit	-
N32/1	Driver seat control unit	With code 241 Fully electric front passenger seat with memory (left)
N32/2	Front passenger seat control unit	With code 242 Fully electric front passenger seat with memory (right)

Lower control panel LIN (LIN A3)

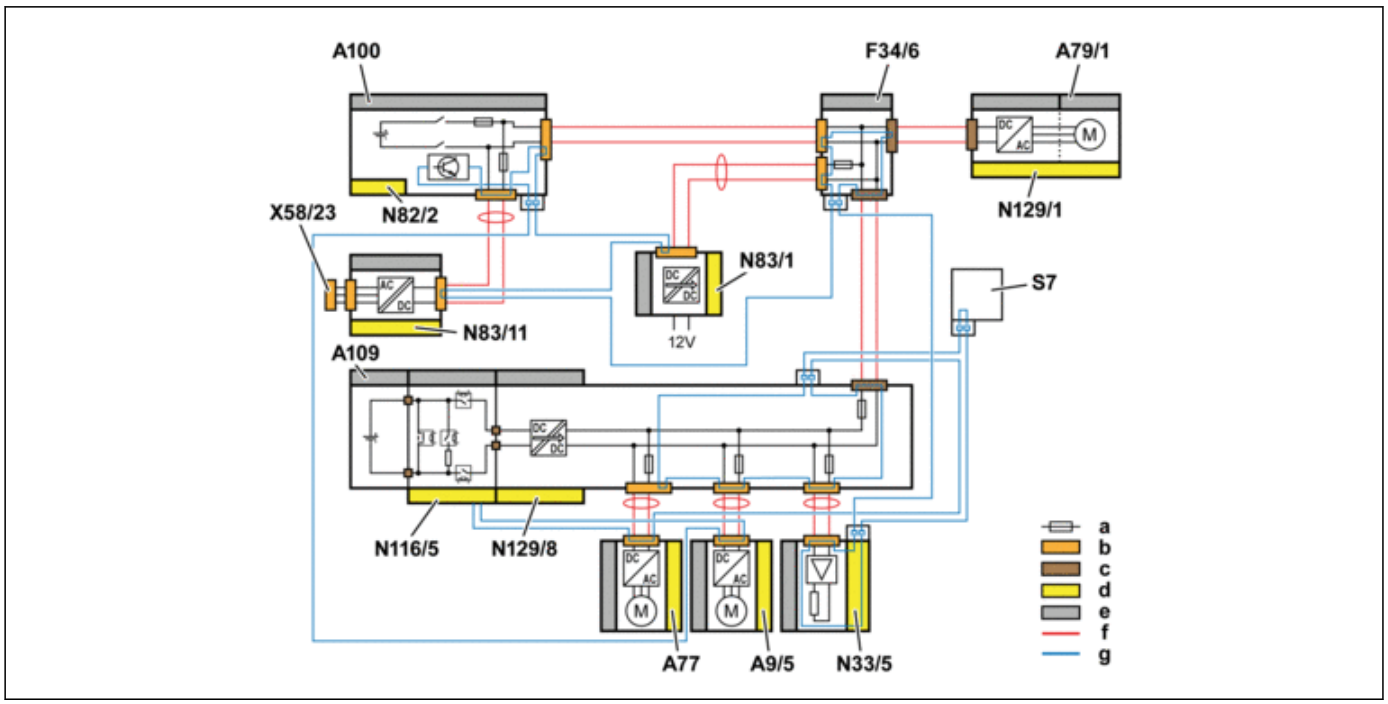
	Control unit	Additional information
A105	Touchpad	-
N72/1	Upper control panel control unit	-
N72/4	Left lower control panel	-
N72/5	Right lower control panel	-

Major features of the networking architecture are:

- CAN communication via different subnetworks
- Chassis-FlexRay™ bus system
- MOST (Media Oriented System Transport) bus
- Ethernet
- Numerous subbus systems designed as single-wire bus (LIN)

The subnetworks are linked via gateways:

- Electronic ignition switch control unit
- Head unit
- Powertrain control unit
- Steering column module control unit
- SRS control unit
- HERMES control unit



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Interlock circuit

A9/5	*Electric refrigerant compressor*	*N129/8*	*Fuel cell DC/DC converter control unit*
A77	*Exhaust air turbocharger*	*N129/8F1*	*Fuse 1*
A79/1	*Electric machine*	*N129/8F2*	*Electrical fuse 2*
A100	*High-voltage battery module*	*N129/8F3*	*Fuse 3*
A100f750	*Electrical fuse 750*	*N129/8F4*	*Electrical fuse 4*
A100f751	*Electrical fuse 751*	*S7*	*High-voltage disconnect device*
A100s1	*Contactor 1*	*X58/23*	*Charger feed-in socket*
A109	*Fuel cell stack*		
F34/6	*High-voltage distributor plate*	*a*	*Fuse*
F34/6f753	*Electrical fuse 753*	*b*	*Connector*
N33/5	*High-voltage PTC heater*	*c*	*Threaded connection*
N82/2	*Battery management system control unit*	*d*	*Control unit*
N83/1	*DC/DC converter control unit*	*e*	*HV component*
N83/11	*Alternating current charger for high-voltage battery*	*f*	*High-voltage line*
N116/5	*Fuel cell management system control unit*	*g*	*Interlock line*
N129/1	*Power electronics control unit*		

The interlock circuit is used as contact protection to protect people against inadvertent contact with high-voltage components. For this purpose, a 12 V/88 Hz signal from the interlock circuit is looped through all components of the

high-voltage on-board electrical system that are to be opened. To this end, there is a jumper in every removable and unscrewable high-voltage connection or cover that conceals access to the contacts carrying a high voltage. When disconnecting or unscrewing the high-voltage connection or the cover, the jumper breaks the interlock circuit.

The interlock circuit is also led switched in a series via the 12 V control units plug connection of the high-voltage components. When detaching a control units plug connection the interlock circuit is interrupted via the contacts interlock input and output.

A discontinuity of the interlock circuit while driving does not lead to switching off of the high voltage on-board electrical system. The high-voltage on-board electrical system is only switched off if the selector lever position "N" or "P" is engaged for longer than three seconds and the vehicle speed is below 5 km/h. Furthermore the high voltage on-board electrical system is also switched off in the selector lever position "D“ for opening of the engine hood.

After switching off the ignition the vehicle cannot be started again if there is a fault in the interlock circuit. For an existing fault in the interlock circuit the vehicle standstill functions (ignition "OFF") are interrupted and the high voltage on-board electrical system deactivated.

Every access to the high-voltage on-board electrical system leads to an interruption of the interlock circuit and thus to the deactivation of the high-voltage on-board electrical system under the above-mentioned conditions.

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Note

The power electronics control unit, the battery management control unit, the alternating current charger for high-voltage batteries and the DC/DC converter control unit have an evaluation circuit for the interlock signal.

The interlock alternator is located in the battery management system control unit. In every active high-voltage component (e.g. high-voltage battery and alternating current charger for high-voltage batteries), there is an interlock evaluation logic which carries out its own evaluation.

The error statuses can also be determined through evaluation of signals from the interlock circuit in the active high-voltage components (e.g. discontinuity, short circuit). In the other components (electric refrigerant compressor, high-voltage PTC heater), the interlock circuit is looped through.

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Note

If, in the event of a crash, the SRS control unit triggers the pyrofuse (F63) or if the high voltage shutoff device is opened, the terminal 30c-signal line is interrupted and the following systems are switched off:

- High-voltage on-board electrical system
- Hydrogen system
- Charging system
- Fuel cell
- Electrical drive

High-voltage crash sensor control unit

The high-voltage crash sensor control unit performs the following tasks in the fuel cell system:

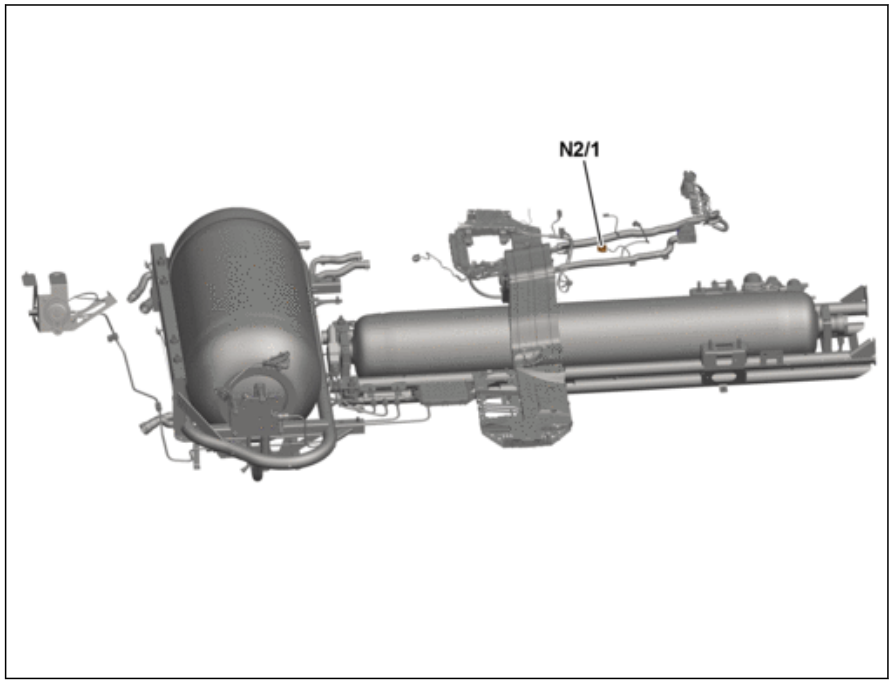
- Cutout of the fuel system in the event of a crash
- Sending a crash signal if the SRS control unit is not active (e. g. during unsupervised operation)

If a crash event occurs in unsupervised operation (ignition key removed, fuel cell unit running, e.g. preparing for a cold start), the high-voltage crash sensor control unit sends the crash signal to the fuel tank control unit. The fuel tank control unit activates the valves on the fuel tanks and the shutoff valve via the fuel cell CAN (CAN FC) and the fuel cell management system control unit in order to close them or to prevent the valves from opening.

If the connection to the high-voltage crash sensor control unit is interrupted in normal operation or there is a malfunction in the component, a warning tone sounds and a warning message appears on the instrument cluster.

View of the fuel system from right

N2/1 High-voltage crash sensor control unit



P54.21-3972-76

SN00.00-P-0080-07D	Driver assistance systems		

Model ***253.99***
with code 9O1 (Fuel cell pre-installation)

Driver assistance system

The driver assistance systems offer greater safety and comfort due to the increased driver assistance. The areas integral safety and Mercedes-Benz Intelligent Drive are increasingly interacting and cooperate synergistically in a cross-system concept. The GLC F-CELL Type 253 receives the new generation of driver assistance systems. The most important systems are compiled in packages. The list contains all technical modifications and new features in comparison to the predecessor generation.

Driving Assistance Packages:

- Lane guidance (with code 22P (Lane Tracking Package)):
  - Blind spot assist
  - Active Lane Keeping Assist

Parking Assistance packages:

- Active Parking Assist with PARKTRONIC with reversing camera (with code 235 (Active Parking Assist with PARKTRONIC)):
  - Intelligent display of parking symbol via comparison with information of navigation system
  - Improved handover to vehicle after assisted parking space exit function
  - Warning of collisions at vehicle sides
- Parking Package with 360° camera (with code 501 (360° camera)):
  - Expanded side view (entire vehicle side)
  - Intelligent display of parking symbol via comparison with information of navigation system
  - Improved feedback to vehicle after assisted parking space exit function

- -

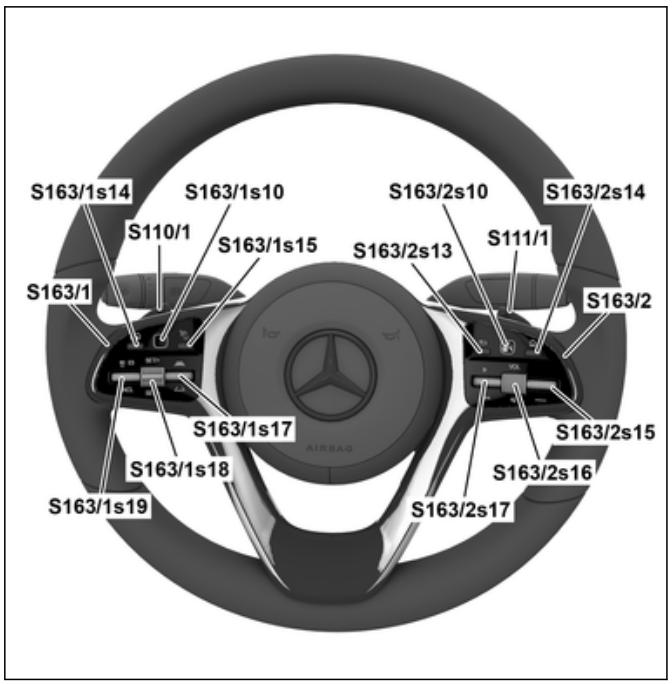
Steering wheel / control elements

The new steering wheel generation is used in the GLC F-CELL Type 253. The control elements for the cruise control/limiter driver assistance systems and Active Distance Assist DISTRONIC are located on the multifunction steering wheel.

Acoustic feedback is provided on operations via the two finger navigation pads. A speaker in the vehicle outputs the feedback tone.

Multifunction steering wheel button group, left-hand drive vehicle

S110/1	*Steering wheel downshift button*
S111/1	*Steering wheel upshift button*
S163/1	*Instrument cluster multifunction steering wheel button group*
S163/1s10	*Instrument cluster finger navigation pad*
S163/1s14	*Home and Back button*
S163/1s15	*Limiter and Active Distance Assist DISTRONIC button*
S163/1s17	*Active Distance Assist DISTRONIC rocker*
S163/1s18	*Cruise control rocker*
S163/1s19	*Cruise control Resume rocker*
S163/2	*Head unit multifunction steering wheel button group*
S163/2s10	*Head unit finger navigation pad*
S163/2s13	*"Back" button*
S163/2s14	*Home button*
S163/2s15	*Accept/terminate phone call switch*
S163/2s16	*Volume control switch*
S163/2s17	*Voice control ON and favorites switch*



P82.90-2555-12

The steering wheel downshift and upshift buttons are used for adjusting the engine drag torque manually. This allows the driver to regulate the intensity of the recuperation.

SN00.00-P-0080-03D	Information, multimedia and communications systems		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

P68.00-8801-76

Information, multimedia and communications systems

The GLC F-CELL Type 253 receives the telematics generation 5.5. The audio system with COMAND Online is standard equipment.

The Head-up Display (standard) projects the information that is important for driving such as the speed, speed limits, navigation instructions or temporary information from the audio system onto the windshield.

The fully digital instrument cluster of the GLC F-CELL Type 253 installed as standard consists of a 12.3-inch display. The GLC 350 e 4MATIC tubes for the instrument cluster are generated optically on the screen. Instead of the tachometer, a power meter is displayed. GLC F-CELL-specific displays as well as an innovative design style clearly distinguish the fuel cell vehicle from the other vehicles in model series 253.

In addition to the high user-friendliness of the systems via the Audio/COMAND control panel, touchpad or the multifunction steering wheel button groups, the perceptibility of the functions is supported. All touch control elements have a configurable acoustic operation feedback.

A new sound concept and the classification in the sound categories already allow the driver to identify the end action via the acoustics: Whether it be to direct the driver's attention to the environment, alert him/her to messages in the instrument cluster, or to prompt him/her confirm an operator action.

Equipment variants:

- TV (with code 865 (TV tuner)), only available in Japan.
- Burmester® surround sound system (with code 810 (Sound system)), only available in Japan.

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Center console and touchpad

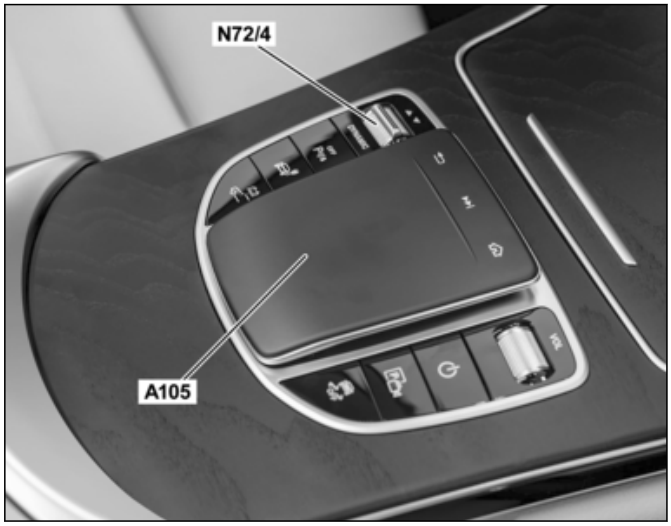
A new feature in the GLC F-CELL Type 253 is the touchpad in the center console, installed as standard. The touchpad is the central operating unit for different telematics functions. The touchpad can be used to operate the functions shown on the Audio/COMAND display (A40/8). The user input (operating gestures, including pressing, and handwriting recognition) is detected by the

touch-sensitive user interface and the palm rest is recognized.

With the introduction of the touchpad, the Audio/COMAND control panel is discontinued..

Center console with touchpad

A105 Touchpad



P54.26-1439-11

SN00.00-P-0080-05D	Comfort systems		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

General

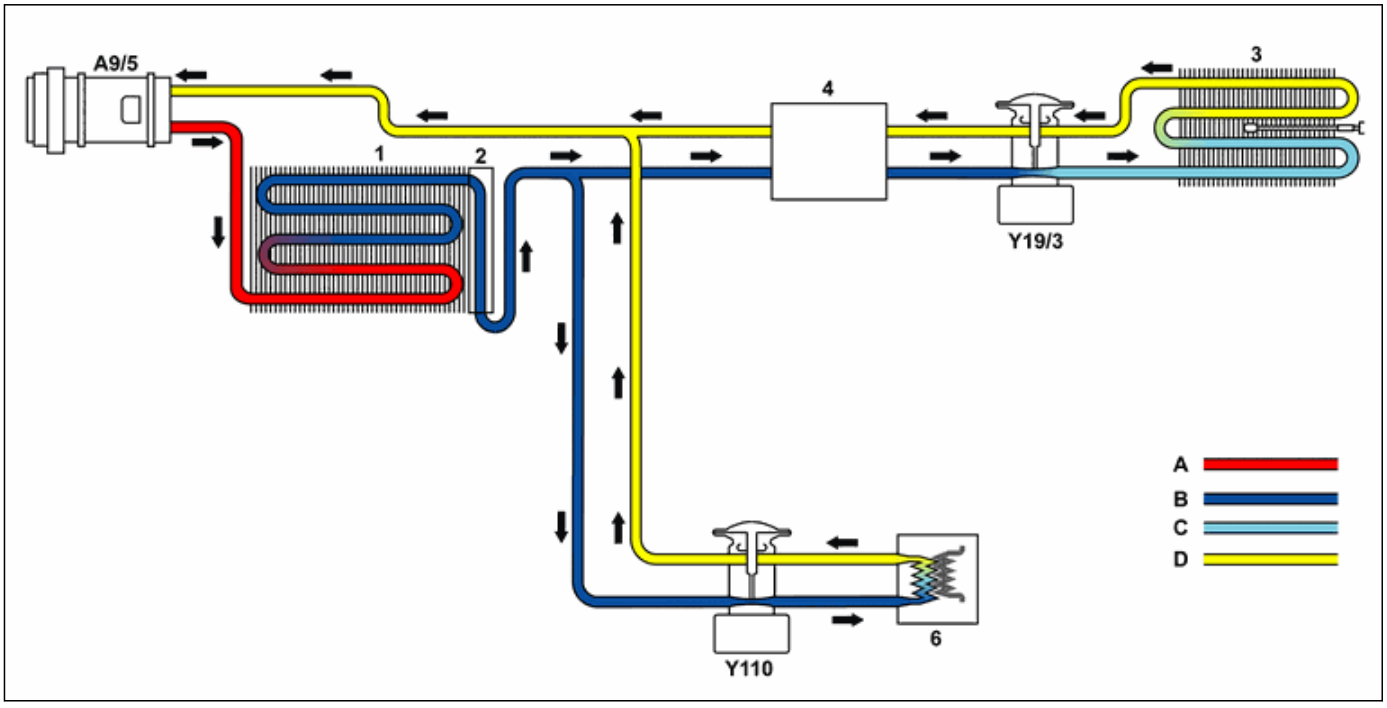
In the GLC F-CELL Type 253, the climate control with 2-zone temperature control (with Code 580 (air conditioning system)) is standard.

The climate control with 2-zone temperature control (with CODE 580 (A/C)) is equipped with a temperature control for the right and left sides of the vehicle. Blower regulation takes place with 1 zone and can be operated manually. The refrigerant circuit is regulated by the climate control control unit (N22/1).

Refrigerant circuit

The refrigerant circuit consists of a high pressure and a low-pressure side. The separation points of the thrust sides are the valve plates at the respective refrigerant compressor and the injection valve at the expansion valve.

The individual components of the refrigerant circuit are interconnected through hoses and pipelines and form a closed system.



P83.40-5049-79

Refrigerant circuit

1	*Condenser*	*6*	*Heat exchanger*
2	*Accumulator (drier)*	*A9/5*	*Electric refrigerant compressor*
3	*Evaporator*	*Y19/3*	*Front evaporator shutoff valve*
4	*Inner heat exchanger*	*Y110*	*High-voltage battery cooling system expansion valve*

Pre-air conditioning

The pre-entry climate control in the GLC F-CELL Type 253 also offers greater comfort when entering the vehicle. The vehicle interior is already pre-heated or cooled down and the air quality (with code P21 (air quality package)) improved. The pre-entry climate control is performed efficiently and with no emissions via the lithium-ion high-voltage battery.

The temporary pre-entry climate control is activated:

- by unlocking when getting into the vehicle
- via pre-entry climate control button
- by activating a departure time in the instrument cluster
- via a browser e.g. with a smartphone, tablet or PC.

The scope of pre-entry climate control includes:

- Automatic air conditioning
- Heating of mirror and rear windows
- Seat heater

In conjunction with COMAND Online or Mercedes me connect, the following functions can be configured:

- Coupling the unlocking of the vehicle with the pre-entry climate control via the vehicle key.
- Coupling the departure time for charging with pre-entry climate control for the departure time via the instrument cluster.
- Synchronizing the departure time for charging with the departure time for the pre-entry climate control.

In general, the climate control times depend on the selected function. Heating mode is possible for a maximum of 300 s. Heating mode is ended after this time has elapsed or when the vehicle is started, or via the pre-entry climate control button. In the case of a sufficiently stable on-board electrical system, the pre-entry climate control can be activated twice.

SN00.00-P-0080-06D	Occupant protection		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Safety concept

The holistic safety concept of the GLC F-CELL is taken from model series 253. The GLC F-CELL Type 253 offers wide-ranging driver assistance systems. In passive safety, particularly strict safety regulations apply in particular for the battery and for all components that contain hydrogen. Most of the drive components and hydrogen tanks of the GLC F-CELL Type 253 are accommodated in the engine compartment and the underfloor, such that they are protected and save space.

Switching off the high voltage on-board electrical system

In the event of an accident or servicing, it must be possible to switch off the high voltage on-board electrical system. To do this, the high voltage output of the high-voltage battery can be disconnected from the high-voltage on-board electrical system using the contactors actuated by the battery management system control unit. The pyrofuse and the high voltage switch-off device are located in the control line of the contractor, connected in series.

Hydrogen safety

The issue of hydrogen safety is based on various standards that were incorporated into development. These include:

- Development in accordance with ISO 26262, EU406/2010, UNECE R134.
- Two pyrotechnical outputs in the SRS control unit to switch off the fuel cell unit in the event of a crash. The tank system is also switched off in the event of a crash. If a serious crash is detected, the shutoff valve and the two tank valves are closed.
- Development and implementation of measures of a concept for stationary crash monitoring during unsupervised hydrogen operation.
- To prevent the ingress of hydrogen into the vehicle interior.
- To prevent hydrogen in cavities and partially closed areas.
- To protect hydrogen components, e.g. underfloor protection for the hydrogen system and protecting the containers against local fire loads.

Accident

The designation "F-Cell" in the radiator trim, on the liftgate and on the longitudinal members clearly identified every vehicle with this alternative drive concept. No special requests to omit this lettering will be entertained (in a departure from the normal situation). This allows the rescue services to see that this is a vehicle with a fuel cell system and high voltage components. In the event of an accident, the high-voltage on-board electrical system can be shut off by the SRS control unit. In addition, there is a rescue separation point (conducting loop for rescue services to be cut through physically) for immediate deactivation of the high voltage on-board electrical system in the footwell on the passenger side.

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Access to the rescue data sheets (rescue cards) of all Mercedes-Benz passenger cars is offered by Daimler AG's mobile app "Rescue Assist". In addition to a QR code scanner for the rescue stickers, this app can also be used to digitally download the rescue data sheet of the vehicle in question by means of a list.

High voltage rapid discharging in the case of a crash

In the event of a crash (pyrofuse ignited or crash signal on CAN), the high voltage on-board electrical system is, at a speed of < 20 km/h, discharged to a voltage of less than 60 V by the electric drive within five seconds. The energy is converted in the process in the stator coil of the electrical machine into heat.

Safety function after an accident - shutoff by restraint system control unit

The automatic shutoff of the high-voltage battery and the discharging of the high voltage components take place during driving or when the ignition has been switched on via the restraint system control unit. Depending on the severity of the accident and the impact side, the high voltage on-board electrical system is switched off reversibly or irreversibly. In the event of a reversible shutoff, a restart procedure may be possible. In the event of an irreversible shutoff, the high voltage on-board electrical system is deactivated via a pyrofuse and can only be re-commissioned by the workshop personnel after replacing the pyrofuse.

"F-CELL" lettering on the radiator trim

P00.01-5001-81

"F-CELL" foil on both sides and longitudinal member panel with trim insert "F-CELL" beneath the rear door

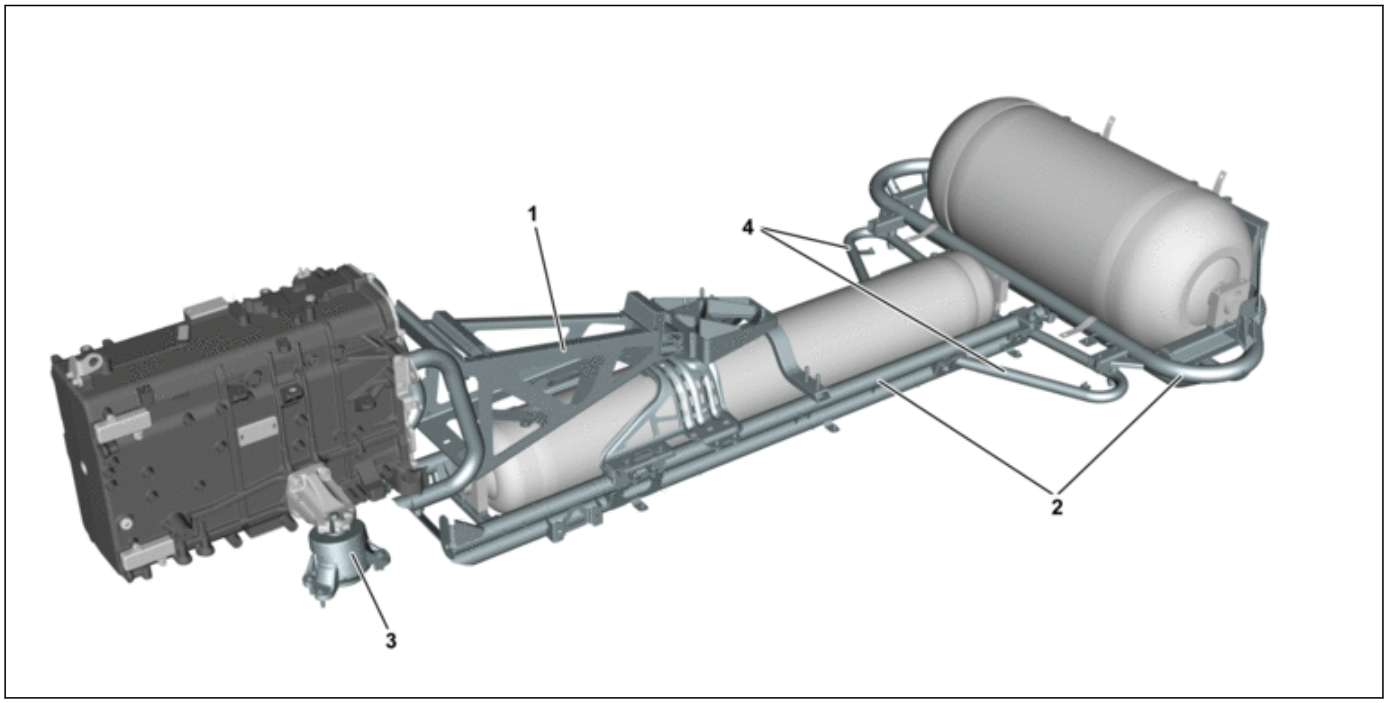
P00.01-5045-81

"F-CELL" lettering on the liftgate

P00.01-5044-81

SN00.00-P-0080-10D	Body		

Model 253.99
with code 9O1 (Fuel cell pre-installation)



P60.00-3212-79

Overview of assembly frame of fuel cell / hydrogen system

1 Assembly frame of engine mount
2 Assembly frame of hydrogen system
3 Engine mount
4 Reinforcement of assembly frame of hydrogen system

Sound insulation

The body structure of the GLC F-CELL Type 253 in a hybrid design has largely been taken from the current GLC. The use of the fuel cell unit in combination with an electromotive drive above the rear area requires special measures in sound insulation. There is no combustion engine and thus no associated noise, the sound from systems such as the coolant pump or vacuum pump becomes more noticeable. At the same time, noise sources arise that are caused, for example, by the fuel cell system.

The noise insulation was therefore adjusted to this new situation in order to be able to maintain acoustic comfort at a high level.

Decoupling the drive unit

Dynamic alternating forces in the electric motor as well as the excitation of the transmission gearing define the characteristics of drive noise during vehicle operation. To reduce the structure-borne noise impact of the electric machine and of the transmission assembly, the drive unit is elastically decoupled from the body twice. This leads to a lower transmission of vibrations to the vehicle structure and thus to further reduced noise in the vehicle interior.

In addition, the electric machine is integrated in the vehicle via soundproofing by means of two shells to keep noise low.

Unit mount

In the area where the rear supporting frame of the fuel cell unit is connected to the body, the main floor has been given additional reinforcement. The reinforcement surrounds the supporting frame attachment. This, in combination with the mounting supports of the front seat crossmember on the tunnel sidewall, helps to prevent any vibrations being generated by the main floor and its resulting noise emissions.

A 3-point connection along with the positioning of the unit mount close to the fastening points on the body, further increases the rigidity application at the mounting point. This facilitates optimum coordination of the following functions of the unit mount:

- Supporting the fuel cell unit
- Dampening resonant vibrations
- Reducing the forces transmitted into the body

Hydrogen system

The integration of the hydrogen tanks into the transmission tunnel required a change in the design of the transmission crossbeam. Through optimization of the component topology, the high requirements facing the dynamic transmission strength and the airborne noise sensitivity at the mount point of the fuel cell unit can be met while the component weight can also be kept low.

SN00.01-P-0000-01D	Service Information		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Disconnect power

To conduct any repair and service operations without any risk of electric shock, the power must be disconnected from the high voltage-on-board electrical system and it must be secured against being switched back on again. Enabling as well as the restart procedure must be documented in a vehicle enabling log or vehicle restart procedure log. The logs are to be filed together with the vehicle repair documents. The power is disconnected on the high voltage on-board electrical system through the guided vehicle diagnosis.

In addition to automatic deactivation of the high voltage on-board electrical system, the GLC F-CELL Type 253 also contains a manual high voltage shutoff device. In order to prevent unauthorized activation of the high voltage on-board electrical system, the shutoff device is locked with a U-lock. The shutoff device is secured against manipulation through its location under the hood in the area of the coolant expansion reservoir.

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With the high voltage shutoff device, the power supply to the valves of the hydrogen system (2 valves of the hydrogen tanks and 1 shutoff valve) are also disconnected.

S7 High-voltage disconnect device

P54.10-4827-76

Diagnosis

The diagnosis of the GLC F-CELL Type 253 is performed as usual with Xentry Diagnostics. This enables the vehicle to be identified with all its equipment features as well as an accurate fault assessment, fault rectification and evaluation of vehicle-specific values and parameters to be made. When conducting diagnosis activities on high voltage vehicles and their high-voltage components, special qualification measures are required. People without this qualification must not perform any diagnoses.

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Only trained workshop personnel ("Expert" for working on high voltage inherent-safety series production vehicles, model series GLC F-CELL Type 253) may perform the power disconnect as well as jobs on the high-voltage on-board electrical system and the fuel cell system.

Working on the vehicle

In order to be allowed to drive a hydrogen-operated vehicle into the workshop, it is necessary to perform some test steps outdoors.

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The necessary test steps have been described in the document "Requirements for driving into the workshop" AH00.00-P-0021-01RFW. It is absolutely essential to perform the test steps in the specified sequence.

There are no dangers to be expected through appropriate handling of the FCS and its modules or components (fuel cell unit, hydrogen tanks, etc.).

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Please read the notes about the fuel cell system AH00.00-P-0022-01RFW.

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Please read the safety information AS00.00-Z-0034-01RFW and AS00.00-Z-0030-01B as well.

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Only trained workshop personnel ("Expert" for working on high voltage inherent-safety series production vehicles, model series GLC F-CELL Type 253) may perform the power disconnect as well as jobs on the high-voltage on-board electrical system and the fuel cell system. Please read the Service Information: "Personal protective equipment for working on high-voltage on-board electrical systems" SI54.10-P-0047A.

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Additional qualifications are necessary for jobs and tests on the gas system (gas system inspection).

Deactivation of high voltage on-board electrical system in event of accident and short circuit

Deactivation of the high voltage on-board electrical system in the event of an accident is initiated by triggering the pyrofuse. The separator element is actuated by the Supplemental Restraint System (SRS) control unit when a crash is detected. This leads to all the poles being separated from the power sources, to deactivation of the electrical machine's generator mode, and to discharging of the capacitors to a value less than the dangerous voltage range. A gradual deactivation of the high voltage on-board electrical system takes place in the event of a short circuit using software and electrical fuses.

Safety precautions

To protect against any contact with the voltage of the high voltage on-board electrical system, numerous safety measures have been implemented. Contact protection is provided for the entire system through the housing, insulation and covers. The components of the high voltage on-board electrical system are connected through electric lines conducting high voltages. Neither the positive nor the negative terminal of the high voltage on-board electrical system is connected to the vehicle mass.

Constructive contact protection safety measures:

- Housing
- Covers
- Insulation
- Electrical connector

The potential equalization consists of a conductive connection to the chassis (vehicle mass).

Specific component request:

- Potential separation
- Isolation resistance
- Voltage sustaining capability

Specific system requirement:

- Total resistance
- Isolation resistance
- Packaging specifications

Warning label

P08.00-2121-80

QR code for rescue services

Thanks to the QR code adhesive label, the rescue service and view the vehicle's rescue card quickly and directly. The code is scanned using an Internet-capable, mobile terminal and a free app. The rescue card is displayed in the language set in the terminal.

Two QR code adhesive labels are attached to the vehicle. One adhesive label is stuck to the inside of the fuel filler flap, the second to the opposite B-pillar.

Towing

The vehicle can be towed away up to a distance of 50 km at a maximum speed of 50 km/h. Requirement:

- Selector lever in position "N"
- The front axle has been raised or both axles are on the ground.

If the rear axle is raised during towing, towing is only permitted if the steering wheel is fixed in the center position with a steering wheel clamp.

When towing in reverse, when the electric motor is also powered via the wheels, towing for 1 minute at a maximum of 30 km/h is permitted.

If one of the following events occurs, the vehicle is to be loaded onto a suitable means of transport:

- The warning lamps for the drive system and/or 12 V battery in the instrument cluster light up.
- Increased or pulsating braking effect
- Failure of the multifunction display
- Transport of the vehicle over a relatively long distance
- One or more of the following display messages appear: stop, engine off or consult a workshop without changing gear.

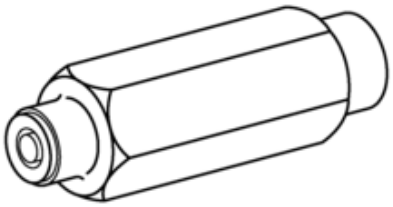
SN00.00-P-0080-11A	Overview of special tools		

Model 253.99
with code 9O1 (Fuel cell pre-installation)

Adapter	
Use	Adapter to the adaptation on the coolant expansion reservoir, design in stainless steel, for leak test of the deionized fuel cell cooling circuit in combination with pressure pump W124 589 24 21 00.
MB number	W253 589 03 91 00
FG	20
kit	A
Category	Mercedes-Benz Passenger Cars Special Operation
Note	The adapter may not be used for filling the cooling circuit.
Pliers	
Use	Pliers for assembling the snap ring and for securing the housing gasket on the removed exhaust air turbocharger.
MB number	W253 589 00 37 00
FG	06
kit	C
Category	Mercedes-Benz Passenger Cars Special Operation
Note	-

invisible

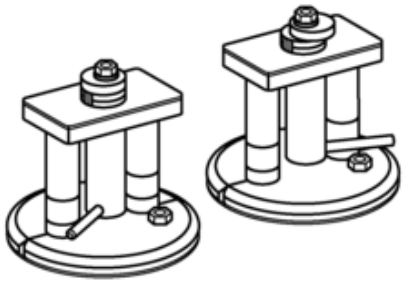
Connector	
Usage	Connector to the adaptation of the evacuation hose and filling adapter on the fuel cell major assembly.
MB number	253 589 00 91 00
FG	06
Set	B
Category	Mercedes-Benz Passenger Cars Special Operation
Note	In combination with evacuation hose W000 588 10 90 00 and leak tester W253 588 01 21 00.



253 589 00 91 00

invisible

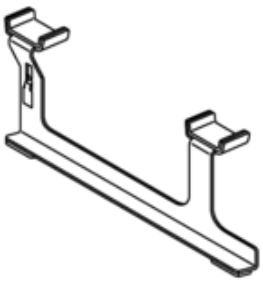
Vehicle lift safety device	
Usage	Vehicle lift safety device for fixing vehicle in place on vehicle lift. Prevents tilting during removal of major assemblies, axles, or fuel tanks.
MB number	253 589 00 31 00
FG	00
Set	B
Category	-
Note	An assembly consists of 2 units. Vehicle lift safety device must be installed on at least one axle. Only in combination with tensioning strap W171 589 01 31 02.



253 589 00 31 00

invisible

Support brace	
Usage	Support for holding or supporting the protective frame for removal/installation of the fuel cell major assembly.
MB number	253 589 00 40 00
FG	06
Set	B/C
Category	Mercedes-Benz Passenger Cars Special Operation
Note	-



253 589 00 40 00

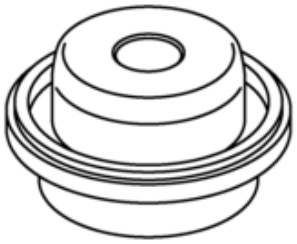
invisible

Plug neck	
Usage	Plug neck for sealing the connection on the H2 injection valve for H2 removal/inerting of the fuel cell major assembly.
MB number	253 589 01 91 00
FG	06
Set	B/C
Category	Mercedes-Benz Passenger Cars Special Operation
Note	-

253 589 01 91 00

invisible

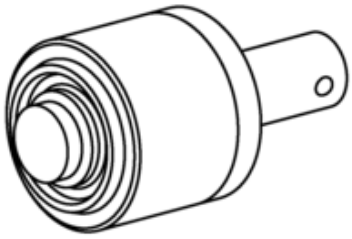
Drift	
Usage	Drift for assembling the radial shaft sealing rings of the drive shafts on the transmission of the electric machine.
MB number	253 589 00 15 00
FG	08
Set	B/C
Category	Mercedes-Benz Passenger Cars Special Operation
Note	-



253 589 00 15 00

invisible

Assembly tool	
Usage	Assembly tool for assembling the housing gasket on the removed exhaust air turbocharger.
MB number	253 589 00 63 00
FG	06
Set	C
Category	Mercedes-Benz Passenger Cars Special Operation
Note	-



253 589 00 63 00

SN00.00-P-0080-14B	Workshop equipment		

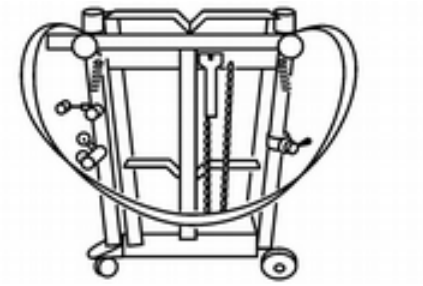
Model 253.99
with code 9O1 (Fuel cell pre-installation)

Leak tester	
Use	Leak tester incl. filling gun for up to 700 bar forming gas (N2H5) for the leakage/ leak test of the H2 system.
MB number	W000 588 21 21 00
FG	47
kit	B
Category	-
Note	Reference information: this workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/suppliers can be found in the WS document.
Tester	
Use	Test equipment/gas gun for manual gassing of the hydrogen sensors with forming gas (N2H5).
MB number	W253 588 00 21 00
FG	06/47
kit	B/C
Category	-
Note	In combination with leak tester W000 588 19 21 00. Reference information: This workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/ suppliers can be found in the WS document.
Vacuum-type cooling system filler fuel cells	
Use	Coolant filling unit, design in stainless steel, for evacuating and filling the deionized fuel cell cooling circuit.
MB number	W253 588 02 21 00
FG	20
kit	A/B
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Reference information: this workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/suppliers can be found in the WS document.
Leak tester	
Use	Adapter for manual MD leakage test and for H2 removal/inerting of the fuel cell major assembly with forming gas (N2H5).
MB number	W253 588 01 21 00
FG	06/47
kit	B/C
Category	-
Note	In combination with leak tester W000 588 19 21 00 and filling unit W000 588 11 82 00. Reference information: This workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/suppliers can be found in the WS document.
Filling device	
Use	H2 refueling equipment/connection set via H2 cylinder rack for H2 rinsing the fuel tanks and refueling the vehicle with up to 200 bar.
MB number	W000 588 12 82 00

FG	06/47
kit	B/C
Category	-
Note	Reference information: This workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead according to the specification of the set of criteria. Recommended information can be found in the WS document.
Filling device	
Use	Filling unit for N2/air for H2 removal/inerting of the fuel cell major assembly incl. electric actuation module.
MB number	W000 588 11 82 00
FG	06
kit	C
Category	-
Note	Reference information: this workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/suppliers can be found in the WS document.

invisible

Leak tester	
Usage	Vehicle for mounting the N2 cylinders incl. filling gun and for N2 filling/inerting of the fuel tanks.
MB number	000 588 09 21 00
FG	06
Set	B
Category	-
Note	Reference information: this workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/ suppliers can be found in the WS document WS06.00-P-0018B.



000 588 09 21 00

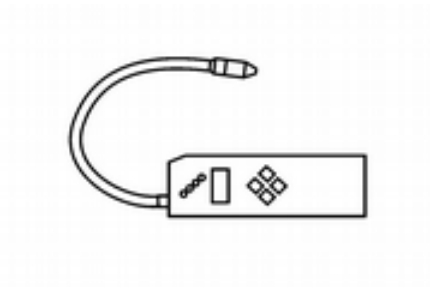
invisible

Drain hose	
Usage	Evacuation hose with connector couplings and H2 draining chimney for H2/N2 emptying the fuel tanks.
MB number	000 588 10 90 00
FG	06/47
Set	B/C
Category	-
Note	Reference information: this workshop equipment is not sold through the regular replacement part ordering process in GLC/LC, but instead directly through the manufacturer/supplier. Recommended workshop equipment and information on the manufacturers/ suppliers can be found in the WS document WS06.00-P-0025B.

000 588 10 90 00

invisible

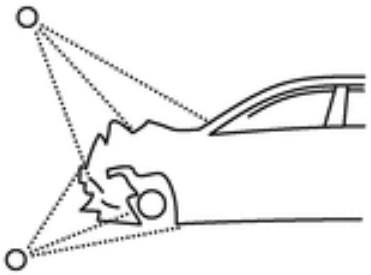
Gas detector	
Usage	Gas detection unit for H2 leakage/leak test on H2 system and "special service, carry out check of gas system".
MB number	000 588 03 21 00
FG	06/47
Set	B
Category	Mercedes-Benz cars/smart/transporters – Basic Operation
Note	This criteria catalog serves to provide support for selection of variants of workshop equipment available on the free market. It just describes the minimum requirement for fulfilling the Mercedes-Benz standard. There is therefore no reference made to manufacturer specific equipment or devices. The gas detection unit can usually be sourced from manufacturers of approved leak testers or selected on the open market based on the criteria catalog.



000 588 03 21 00

invisible

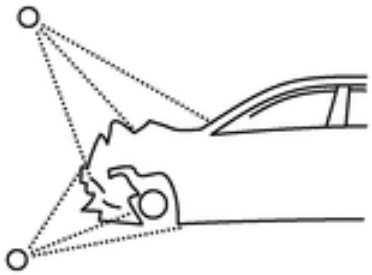
Body measurement system	
Usage	Body measurement system for measuring bodies.
MB number	000 588 11 23 00
FG	60/61/62/63/64
Set	K
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Only the electronic measuring system and not beam trammel measurement is permitted for the specification of the damage scope with a measuring system due to the tight bodyshell production tolerance. The post-accident alignment check and in particular the analysis of all aluminum structural parts of the body are solely realized by means of the repair method described in WIS.



000 588 11 23 00

invisible

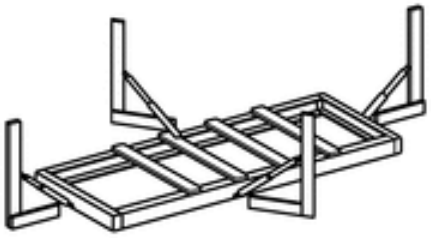
Body measurement system	
Usage	Body measurement system for measuring bodies.
MB number	000 588 14 23 00
FG	60/61/62/63/64
Set	K
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Only the electronic measuring system and not beam trammel measurement is permitted for the specification of the damage scope with a measuring system due to the tight bodyshell production tolerance. The post-accident alignment check and in particular the analysis of all aluminum structural parts of the body are solely realized by means of the repair method described in WIS.



000 588 14 23 00

invisible

Body straightening system	
Usage	Body straightening system for measuring and repairing bodies.
MB number	000 588 04 23 00
FG	60/61/62/63/64
Set	K
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Only the electronic measuring system and not beam trammel measurement is permitted for the specification of the damage scope with a measuring system due to the tight bodyshell production tolerance. The post-accident alignment check and in particular the analysis of all aluminum structural parts of the body are solely realized by means of the repair method described in WIS.



000 588 04 23 00

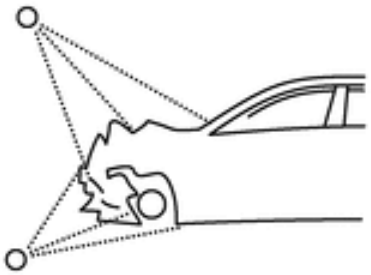
invisible

Data sheet	
Usage	Vehicle specific assembly note for setting up straightening bench.
MB number	253 588 24 23 00
FG	60/61/62/63/64
Set	B/K
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Technical note: Only in combination with body straightening system W000 588 04 23 00. The analysis and attachment of all aluminum structural parts of the bodyshell is performed exclusively using the repair method described in WIS.

253 588 24 23 00

invisible

Body measurement system	
Usage	Body measurement system for measuring bodies.
MB number	000 588 06 23 00
FG	60/61/62/63/64
Set	K
Category	Mercedes-Benz Passenger Cars Special Operation
Note	Only the electronic measuring system and not beam trammel measurement is permitted for the specification of the damage scope with a measuring system due to the tight bodyshell production tolerance. The post-accident alignment check and in particular the analysis of all aluminum structural parts of the body are solely realized by means of the repair method described in WIS.



000 588 06 23 00