Glow Plug Control Units

Technical Information

Beruparts.eu

Perfection built in

BERU®

FEDERAL-MOGUL MOTORPARTS

FUNCTION OF THE GLOW PLUG CONTROL UNIT

Thanks to innovative technology, today's diesel engines are more quiet, more efficient and cleaner. For more than 100 years BERU is a trusted technological partner to the automotive industry and the aftermarket, continuously adding innovative developments to its trusted range of diesel starting technologies.

Glow Plug Control Units are an innovation in the ever expanding BERU product range, adding even more intelligence to the modern diesel engine. The Control Unit plays a vital role in optimizing the function of the BERU glow plug.

Both components work hand in hand to extract the optimum performance out of the engine. Engines equipped with a BERU Glow Plug Control Unit run clean and smooth during the start-up phase

QUICK-LOOK BENEFITS

- **Flawless**
  Glow Plug Control Units offer an ideal starting operation
- **360°**
  BERU brings an extended quality solution to your cold-starting operation needs
- **Consistent**
  Combined with the ISS technology, BERU Glow Plug Control Units offer consistent performance results

BERU HAS A SOLUTION FOR MOST TYPES OF DIESEL ENGINES:

The BERU Glow Plug Control Unit communicates with the ECU and translates vital information such as glow request, engine speed, coolant temperature and the amount of injected fuel to an exact desired glow plug voltage. The unit then adjusts the current on-board voltage to this value, optimising engine operation.

Also, when the engine doesn't operate as it should, the BERU Glow Plug Control Unit offers added diagnostical data.

Solutions for newer applications: Glow Plugs Control Units allow a constant communication with the ECU of the engine.

Solutions for older applications: Glow Plug Relays work mainly as a switcher for the glow plug.

TRUSTED TECHNOLOGY

Beru Glow Plugs and Control units are developed, tested and built in Western Europe by BorgWarner to the OE specifications and quality standards. BERU offers a large range of Ignition Cold Start Technology for diesel engines.

With more than 100 years of experience, coupled with continuous development, BERU is one of the leading providers in advanced technology in the aftermarket and as BorgWarner a renowned OEM supplier to the automotive industry. The facilities in the BorgWarner Group are certified to global quality standards, such as DIN ISO 9001:2000. The requirements of ISO/TS 16949 and DIN EN ISO 14001 are also met. BERU glow plugs are designed in compliance with ISO Standard 7578 and 6550. These specify the dimensions and tolerances of the geometry, the sealing angle, the wrench size, the heating rod diameter, etc.

BERU Glow Plug Control units are engineered and manufactured at BorgWarner

BERU QUALITY

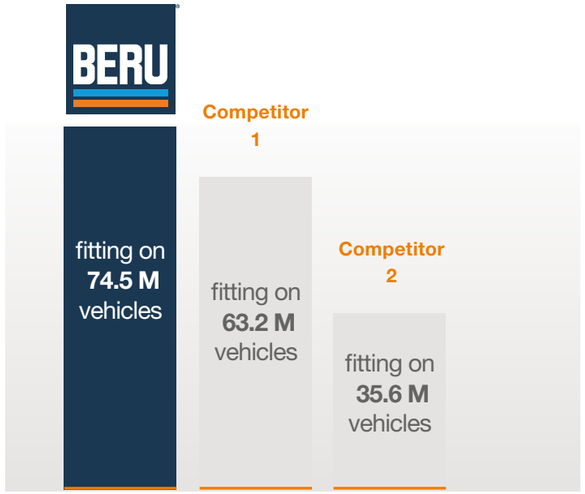
- Products are designed by BorgWarner in close cooperation with car manufacturers
- Products are developed according to the specifications of the automotive industry
- Manufacturing according to ISO standards
- Products are subjected to special BERU tests
- Manufacturing according to up to date production methods

COVERAGE

While covering 95%* of the glow plug market for diesel cars in Europe, BERU also offers a fast growing range of Glow Plug Control Units, both for mainstream and premium OE manufacturers.

BERU continually invests in new products to meet the customer needs and has reached a market coverage of 90%* for Glow Plug Control Units for European diesel cars equipped with a glow plug control unit.

BERU offers the largest range* of Glow Plugs Control Units for Diesel cars



In the European market including Russia

* Source : F-M PI/TecDoc 2018
www.tecalliance.net/en/company
(Not all Diesel cars are equipped with a Glow Plug control unit)

OE BUSINESS

BorgWarner (manufacturer of BERU products) has an international reputation for delivering innovative ignition solutions that meet original equipment (OE) manufacturer standards.

BorgWarner produces OE glow plugs, also for recent applications such as those displayed (depending on the engine), which are delivered to the aftermarket via Federal-Mogul Motorparts under the BERU brand.

- Audi A4 (DEUA, CZHA, DFVA, DESA, DETA), A6 (CNHA, DDDA) & Q5 (CNHA)
- Ford Ranger
- Land Rover Discovery Sport (224DT)
- Kia Soul (D4FB)
- Mercedes-Benz S-Class (OM 642.867)
- Opel Insignia Country Tourer (A20DTH)
- Seat Leon (CLHA)
- Skoda Superb III (DFEA, CRLB, DFGA)
- VW Passat Alltrack (DFCA, DDAA)

GLOW PLUG CONTROL UNITS & GLOW PLUGS: BERU SYNERGY

Todays highly technological diesel engines operate at very high standards and therefore all components should be in top condition. Running the engine with worn or broken ignition parts causes lower performance, higher emissions, premature wear or even severe damage. This risk is even higher in vehicles equipped with an automatic start/stop-function that predominantly drive in urban environments.

Defective glow plugs are often caused by a faulty Glow Plug Control Unit, which exceeds the permissible current voltage. This results in exceeding the maximum allowance glow temperature and thus to the premature failure of the glow plug.

Failure in the Relay or Glow Plug Control Unit can be caused by defective or corroded connectors or broken lines, or defective glow plugs.

BERU recommends to only use glow plugs that are engineered and built to the OE-standard. Many installers are tempted by cheap alternatives. These are often prone to breaking during the installation, causing headaches while working in the crammed engine bays of modern cars.

THE INNOVATIVE BERU PRESSURE SENSOR GLOW PLUG (PSG)

This is the world's first glow plug which enables the regulation of the combustion processes inside a closed loop system, developed by BERU. Pressure Sensor Glow (PSG) plugs, equipped with a moving heating rod, measure the rapidly changing pressure in the combustion chamber during each combustion cycle and continuously transmit this information to the ECU. This allows higher peak pressures, pushes combustion processes even further to their limit and enables constantly stable emissions throughout the entire engine's service life. BERU Pressure Sensor Glow plugs play a vital role in the accurate control of the combustion processes.

The main benefits of BERU PSG plugs are:

- Extremely accurate pressure readings allow the ECU to constantly adapt the ignition, fuel injection, charge pressure and EGR-rate
- Engine can operate within its optimum window, reducing noise and emissions and improving performance, especially during cold starts
- Compensates for component tolerances, injector ageing and inaccurate fuel quality
- No need for costly NOx untreated emissions sensors at OEM stage

THREE TYPES OF GLOW PLUG CONTROL UNITS:

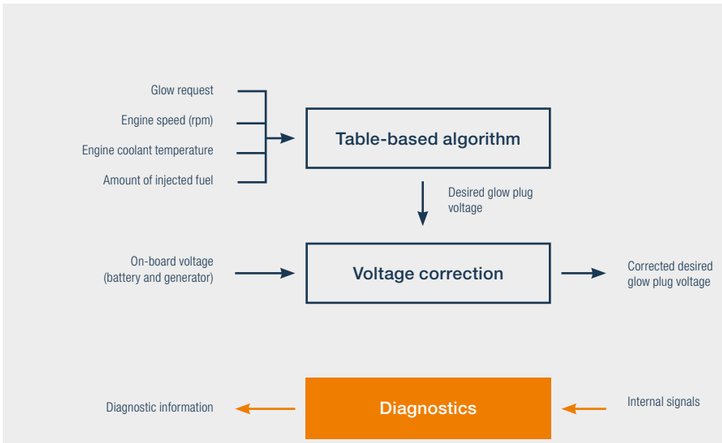
Glow plug control relay

Glow plug control unit ASIC-based

Glow plug control unit micro-controller

GLOW PLUG CONTROL RELAY

The relay regulates the current based on data collected by sensors that measure, for instance, coolant temperature. The measured value is compared with either an entered one, or with a target calculated by the control unit. When these values don't match, the control unit adjusts the current.



GLOW PLUG CONTROL UNIT – ASIC-BASED

The control unit with Application Specific Integrated Circuit (ASIC) does not operate autonomously, but receives the request for the glow function from the ECU. This type of unit is used for flow control and monitoring of low-voltage glow plugs with a nominal voltage lower than 11. The effective voltage applied is achieved through pulse width modulation.

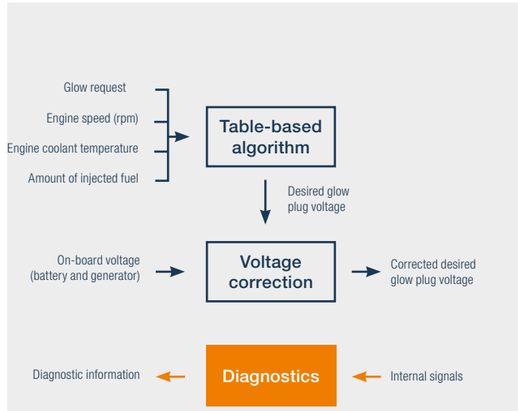
Main advantages of this system are the optimised current control, voltage adaptation and simplified diagnostics. The unit is protected from moisture by its silicone encapsulation.

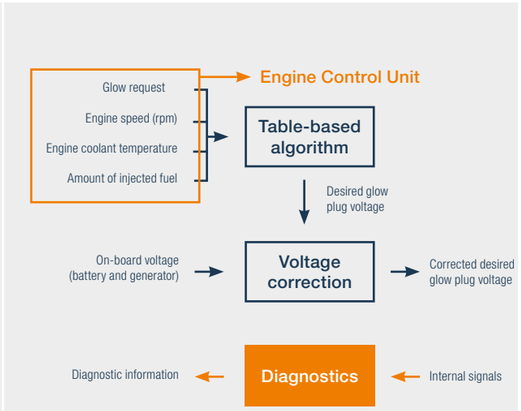
GLOW PLUG CONTROL UNIT – MICRO-CONTROLLER

The control unit with micro-controller communicates in both directions with the ECU through a BUS-system. Air requirement, speed injection quantity and engine temperature are fed through the unit and then to the plug, with the effective voltage applied through pulse width modulation, while feedback is sent back to the ECU. In case of failure in the BUS-network, the glow plug has an emergency function to guarantee start-up of the engine.

This advanced system not only regulates the required voltage in precise fashion, it also allows programming of the temperature profile and dynamic reglow. It has an error memory and offers full diagnostics. Just as ASIC-based control units, these are protected from moisture by its silicone encapsulation.

A notable exception is the glow plug control unit used by Opel/Vauxhall, which has integrated power electronics.





	ASIC-BASED	MICRO-CONTROLLER
Features independent from the type of the housing	Optimised current control Voltage adaption Simplified diagnostics	Customer defined temperature profile Energy controlled fast heat-up Optimised current control Voltage adaption Dynamic reglo\w Full diagnostics Error Memory
Features to be implemented on the engine control unit	Glow request generation GP voltage control (customer defined temperature profile) Energy controlled fast heat-up Dynamic reglow Error memory	Glow request generation

Ignition Technology & Diesel Cold Start Technology

Glow Plugs

- GN: Heating plug, pre-heating - start heating - after-heating
- GV: Glow plug (pre-heating)
- GF: Glow plug for flame-start engines
- GD: Glow plug with wire filament
- GH: Glow plug for additional heaters

Instant Start System (ISS)

GE: Heating plug electronically controlled, pre-heating - start heating - after-heating

Ceramic Glow Plugs (CGP)

Fast, heat-resistant, durable

Pressure Sensor Glow Plugs (PSG)

PSG is an intelligent glow plug with integrated combustion chamber pressure sensor which reports data to the engine control electronics

Ignition Coils

- Distributor Ignition Coils
- Pencil Coils/Plug Top Coils
- Block Ignition Coils
- Ignition Coil Rails

Glow Control Units

- GR: Glow Plug Relays
- GSE: Glow Plugs Control Units

Spark Plugs

- Ultra
- Platin
- Ultra Plus Titan
- Iridium

Ignition Leads

Sensors

- Lambda sensors
- Speed sensors
- Temperature sensors
- Pressure sensors

Tools

- Tools for Spark Plugs
- Tools for Glow Plugs

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