Better performance for the workshop

Denoxtronic diagnosis, replacement and service for experts – The comprehensive range of services for exhaust-gas treatment
Exhaust-gas treatment
Denoxtronic from Bosch
p. 04

Denoxtronic operating principle
Technology
p. 06

Technical training
Overview
p. 19

Denoxtronic spare parts
Overview
p. 18

Denoxtronic repairs
Program & product details
p. 16
Professional testing and replacement
Denoxtronic from Bosch

Bosch offers a wide range of services for the diagnosis and maintenance of the Denoxtronic exhaust-gas treatment system. The market for the exhaust-gas treatment of diesel vehicles is growing continuously – and this means huge potential for workshops. As a systems developer, Bosch draws upon its many years of experience and expertise in this area. We offer the most suitable solutions for the entire process – from diagnostics and parts to replacement and training.

Denoxtronic diagnosis
Program & product details
p. 08

Denoxtronic components
Program & product details
p. 10

Exhaust-gas sensors
Program & product details
p. 15

Departronic particulate-filter regeneration
Program & product details
p. 14

Denoxtronic filter
Program & product details
p. 12
Since the manufacture of the first diesel truck in 1924, and the first diesel car in 1936, Bosch has been one of the world’s leading providers of diesel technology. Denoxtronic – the exhaust-gas treatment and dosing system that is being used in the majority of diesel vehicles, has great significance, and thus potential, for workshops. The system injects an aqueous urea solution (AdBlue) into the exhaust stream and, in combination with the SCR catalytic converter, converts harmful nitrogen oxides ($\text{NO}_x$) into water and nitrogen.

Know-how since 2005
These days, Bosch Denoxtronic systems are built in to commercial vehicles around the world. In 2005, the first Denoxtronic System for trucks was introduced. Since then Denoxtronic has been continuously developed to help to fulfill the stringent emission standards. Since the introduction of the European exhaust-gas standards 4 and 5, the number of vehicles that are equipped with Denoxtronic has been increasing steadily. An increasing number of vehicle manufacturers are using the Bosch system to ensure that high diesel performance vehicles are in compliance with emission limits.

Advantages at a glance
- **Reduction of NOx emissions** ensure that vehicles are in compliance with applicable emissions standards
- **Fuel-saving engine design**
- **Proven, robust technology**
Exhaust-gas treatment
Market trends and potential

The comprehensive service program from Bosch offers diesel experts a high degree of flexibility and the opportunity to serve this important market.

Huge demand for service
A large number of trucks, construction vehicles and agricultural vehicles, as well as stationary systems (generators) are equipped with Denoxtronic. Numerous vehicles already have high mileages. This also increases the demand for services and cost-effective system repairs. To cater to the needs of this diverse market, Bosch has developed a service program for its aftermarket. The Denoxtronic field maintenance process is simple and logical: testing of the components according to manufacturers’ specifications, replacement of defective parts and final testing to verify functionality. Bosch provides everything from a single source: equipment, tools and the software that are required for efficient and time-saving service. Regardless of whether it is the replacement of defective modules or comprehensive repairs that are needed – every workshop can carry out comprehensive diagnostics and replacements of the Denoxtronic components. Due to the increasingly strict emissions standards, Denoxtronic systems will continue to be an important part of exhaust-gas treatment in the future.

Did you know?

Approximately
12 Million
Denoxtronic systems are built into commercial vehicles as well as construction and agricultural vehicles around the world.
During the exhaust-gas treatment, a selective catalytic reduction of nitrogen oxides (NOx) takes place. The process is based on the fact that a reducing agent combined with oxygen reduces nitrogen oxides.

A urea-water solution is used as a reducing agent in vehicle applications. The urea-water solution is known under the name AdBlue. The AdBlue dosing system from Bosch, called Denoxtronic, is a modular system. It ensures the exact measurement and distribution of the reducing agent AdBlue.

Denoxtronic consists of the dosing control unit 1, the supply module 2 and the dosing module 4.

The supply module brings AdBlue to the required pressure and feeds it to the dosing module. The dosing module ensures the precise quantity of AdBlue is atomized and injected into the exhaust stream. The intermediate dosing control unit calculates the required amount.
Denoxtronic service offer
Overview

Thanks to many years of experience and expertise in original equipment, Bosch also offers the aftermarket a wide range of efficient diagnostics, replacement, and service solutions for exhaust-gas treatment. This enables the workshop to carry out service easily and efficiently through precise diagnosis and clear identification of defective components as well as the rapid replacement of Denoxtronic modules.

Did you know?

AdBlue is a watery urea solution composed of up to 32.5% urea and up to 67.5% demineralized water. Due to its high water content, AdBlue freezes and expands at just 

\[-11.5^\circ\text{Celsius}\]

Celsius. In this case, compressible compensation elements prevent damage to both the filter and the supply module.
With the Denoxtronic test set and a diagnostics tester, different functional tests can be carried out on installed components (independently of vehicle manufacturer specifications), e.g.:

- Pressure test
- Dosing quantity test
- AdBlue quality test (composition and contamination)

**Did you know?**

With the Denoxtronic test set and a diagnostics tester, different functional tests can be carried out on installed components (independently of vehicle manufacturer specifications), e.g.:

- Pressure test
- Dosing quantity test
- AdBlue quality test (composition and contamination)
Denoxtronic diagnosis
Program & product details

The test sets are designed to work on the Denoxtronic 1.1 exhaust-gas treatment system or the Denoxtronic 2.1 and 2.2 systems. The diagnosis take place directly on the components that are installed in the vehicle, thereby shortening the downtime of the truck.

The Denoxtronic 1.1 test set is used when carrying out the functional test via the system diagnostics and the field repairs. The tests encompass the checking of the air circuit, the measurement of the dosing amount and the testing of the pump performance.

The Denoxtronic 2.1/2.2 test set is used for the assessment of the hydraulic system leakproofness as well as the dosing and supply quantity test in the Denoxtronic diagnosis.

The following models can be tested with the Denoxtronic 1.1 tool set:
- DAF, Heuliez, Iveco, MAN, Mitsubishi – Fuso, Scania, TEMSA, UD Trucks

The following models can be tested with the Denoxtronic 2.1 tool set:
- Case IH, Iveco, New Holland, Renault, Volvo Trucks

The following models can be tested with the Denoxtronic 2.2 tool set:
- CAT, CNH, Cummins, DAF, Deutz, FAW, Hino, Isuzu, Iveco, John Deere, Nissan, Renault, Temsa, UD Trucks, Volvo Trucks, Volkswagen

ESI[tronic] 2.0 Online + KTS Truck – an unbeatable team

ESI[tronic] 2.0 Online with the info type Truck, info type OHW 1 and info type OHW 2 as well as the KTS Truck, a modular entry-level device in commercial vehicle diagnostics, make it possible to carry out extensive vehicle diagnostics on commercial vehicles, trailers, buses as well as on agricultural vehicles, construction vehicles and engines.

A Denoxtronic service begins with the vehicle diagnostics by means of a KTS Truck and the ESI[tronic] 2.0 Online Truck or OHW. In many cases, the faulty component can already be clearly identified at this stage.
Did you know?

**Denoxtronic components**

**Program & product details**

<table>
<thead>
<tr>
<th>Denoxtronic 1.1</th>
<th>Denoxtronic 2.1</th>
</tr>
</thead>
<tbody>
<tr>
<td>System pressure</td>
<td>3.8 bar</td>
</tr>
<tr>
<td>Operating voltage</td>
<td>24V</td>
</tr>
<tr>
<td>Maximum dosage amount</td>
<td>9 kg/h</td>
</tr>
<tr>
<td>Applications</td>
<td></td>
</tr>
</tbody>
</table>

**Advantages at a glance**

- **Support for compliance with the emission standards** through reduction of the NOₓ emissions
- **Long service life** thanks to proven, robust technology
- **Efficient solutions** for fast and easy replacement of the modules in the service

**Bosch eXchange** offers an attractive option for fast and efficient vehicle repairs with its comprehensive replacement program. It comes with the same warranty as the Bosch new product range. The Denoxtronic 1.1, 2.1 and 2.2 supply modules are also available as Bosch eXchange products.

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**Program & product details | Denoxtronic components**

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**Supply module 1.1**

| Description | The supply module brings the AdBlue to the required pressure and feeds it to the dosing module. |
| DCU | integrated |
| Heating | electric |

**Supply module 2.1**

| Description | The supply module brings the AdBlue to the required pressure and feeds it to the dosing module. |
| DCU | integrated |
| Heating | electric |

**Dosing module 1.1**

| Description | The dosing module ensures the precise quantity of AdBlue is atomized and injected into the exhaust stream. |
| Water chiller | No water chiller required (separate spray head provided) |

**Dosing module 2.1**

| Description | The dosing module ensures the precise quantity of AdBlue is atomized and injected into the exhaust stream. |
| Water chiller | through AdBlue circuit |
Denoxtronic components
Program & product details

<table>
<thead>
<tr>
<th>Denoxtronic 2.2</th>
<th>Denoxtronic 6-5</th>
<th>Denoxtronic 6-HD</th>
</tr>
</thead>
<tbody>
<tr>
<td>9.0 bar</td>
<td>5.0 bar</td>
<td>9.0 bar</td>
</tr>
<tr>
<td>12V or 24V</td>
<td>12V or 24V</td>
<td>12V or 24V</td>
</tr>
<tr>
<td>12 kg/h</td>
<td>5.4 kg/h</td>
<td>15 kg/h</td>
</tr>
</tbody>
</table>

**Supply module 2.2**

- The supply module brings the AdBlue to the required pressure and feeds it to the dosing module.
  - not integrated
  - electric
  - or through cooling water circuit

**Supply module 6-5**

- not integrated
  - electric

**Supply module 6-HD**

- not integrated
  - electric
  - or through cooling water circuit

**Dosing module 2.2/2.5**

- The dosing module ensures the precise quantity of AdBlue is atomized and injected into the exhaust stream.
  - through cooling water circuit

**Dosing module 2.2/2.5**

- through cooling water circuit

**Dosing module 2.6**

- through cooling water circuit

Advantages at a glance

- **Support for compliance with the emission standards** through reduction of the NO\textsubscript{x} emissions
- **Long service life** thanks to proven, robust technology
- **Efficient solutions** for fast and easy replacement of the modules in the service

**Did you know?**

**Regular filter replacement**

The replacement of the Denoxtronic filter is a maintenance measure that should be carried out regularly. In this way, compliance with the legally required emissions standards is ensured. The replacement interval is determined by the vehicle manufacturer and can be found in the ESI[tronic] maintenance schedule.
Bosch Denoxtronic filters protect the Denoxtronic injection system in commercial vehicles and off-highway vehicles. They reliably remove particles from AdBlue thus contributing to optimum dosing.

Advantages at a glance

- **High particle separation** rate due to microporous filter medium with special impregnation
- **High particle holding capacity** due to large filter surface
- **Chemical resistance to aggressive AdBlue** due to usage of high-quality materials
- **Frost resistance** through compressible compensation elements

Clean AdBlue for an optimal dosage

This video shows how the exhaust-gas treatment system in commercial vehicles works and what role the Denoxtronic filter plays in keeping it working.
Replacement of Denoxtronic 2.1 filters

The filter is screwed onto the housing cover of the Denoxtronic supply module and is extracted from the housing along with the cover. In case the filter detaches from the cover or gets stuck at the housing, it can be extracted using the extraction tool.

Replacement of Denoxtronic 2.2 filters

Using the extraction tool, the filter is extracted from the Denoxtronic supply module. The matching extraction tool is included within the service kit.
Departronic particulate-filter regeneration
Program & product details

Departronic doses and injects the fuel upstream of the oxidation catalytic converter and the diesel particulate-filter. Efficient regeneration of particulate-filters is achieved by optimum adjustment of injection timing and quantity.

<table>
<thead>
<tr>
<th>Metering unit</th>
<th>Injection unit</th>
</tr>
</thead>
<tbody>
<tr>
<td>The metering unit of the Departronic system determines the required dosing quantity and forwards it to the injection unit.</td>
<td>The injection unit of the Departronic system ensures a precise fuel injection and handles its atomization and distribution within the exhaust pipe.</td>
</tr>
</tbody>
</table>

Advantages at a glance

- **Fuel savings** through the high efficiency of the particulate-filter regeneration
- **Maintenance-free, long service life** thanks to robust design
- **High performance quality** through proven Bosch know-how
- **Efficient solutions** for fast and easy replacement of the modules in the service

Did you know?

**Departronic**

Unlike pure engine-internal measures of particulate-filter regeneration such as post-injection, Departronic doses and injects the fuel upstream of the oxidation catalytic converter and the diesel particulate-filter. Efficient regeneration of particulate-filters is achieved by optimum adjustment of injection timing and quantity.
An increasing number of light and heavy commercial vehicles are being equipped with particulate and NOx sensors. As a result, sensors are becoming increasingly important for aftermarket business. The Bosch workshop program already offers particulate and NOx sensors for many vehicles in the market and will also be extended for commercial vehicles in the near future.

### Program extension planned for particulate and NOx sensors

An increasing number of light and heavy commercial vehicles are being equipped with particulate and NOx sensors. As a result, sensors are becoming increasingly important for aftermarket business. The Bosch workshop program already offers particulate and NOx sensors for many vehicles in the market and will also be extended for commercial vehicles in the near future.

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**Lambda sensor**

Lambda sensors measure the oxygen content in the exhaust-gas and provide the necessary information for the optimal air-fuel mixture to the engine control unit. They support a clean combustion to ensure that emissions standards are complied with.

**Exhaust-gas temperature sensor**

Exhaust-gas temperature sensors monitor the optimum temperature range and protect high-quality components such as turbochargers, catalytic converters and diesel particulate filters in the hot exhaust-gas system. They ensure ideal regulation behaviour of the exhaust-gas cleaning components.

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**Advantages at a glance**

- **High performance and reliability over a long service life** through functional and quality tests according to the same standards as original equipment
- **Outstanding corrosion resistance** in the high-stress area around the exhaust-gas system thanks to high-quality materials and robust design
- **Reduced stay of the vehicle in the workshop and time savings** thanks to trouble-free installation of the sensors
Denoxtronic repairs
Program & product details

In cases when it is necessary to remove the Denoxtronic component from a commercial vehicle, reliable and quick diagnosis and repairs can be carried out using repair solutions from Bosch. With the recommended testing and repair tools, technical instructions and spare parts with original equipment quality, Denoxtronic repairs can be carried out successfully.

Advantages at a glance

- **Carry out all the functional tests, as recommended by Bosch**, on the removed component
- **High-quality component repairs** thanks to repair instructions in ESI[tronic] and parts in original equipment quality
- **The repairing of components** – an affordable solution for the customer
- **Contribution to compliance of the legal emissions standards** through repair of the defective components

Did you know?

The Denoxtronic test sets are used in conjunction with a diagnostics tester, e.g. a Bosch KTS 560/590 – for a targeted diagnosis.
Denoxtronic repairs
Program & product details

Denoxtronic 1.1
- DAF, Heuliez, Iveco, MAN, Mitsubishi – Fuso, Scania, Temsa, UD Trucks (*)

Denoxtronic 1.1 tool set
0 986 610 551

Denoxtronic 2.1
- CASE IH, Iveco, New Holland, Renault, Volvo Trucks (*)

Denoxtronic 2.1 tool set
0 986 610 571

Denoxtronic 2.1 to 2.1 extension set
0 986 610 581

Denoxtronic 2.2
- CAT, CNH, Cummins, DAF, Deutz, FAW, Hino, Isuzu, Iveco, John Deere, Nissan, Renault, Temsa, UD Trucks, Volvo Trucks, Volkswagen (*)

Denoxtronic 2.2 tool set
0 986 610 561

Denoxtronic 2.1 to 2.2 extension set
0 986 610 541

Special accessories

Denoxtronic workbench
0 986 613 880

Voltage stabiliser
1 687 022 873

Adapter module (Scania)
0 986 610 173

Test adapter
0 986 610 174

KTS 5xx and ESI[tronic]
Please speak to your wholesaler

(*) Depending on the equipment level in the workshop and the vehicle manufacturer and/or vehicle type, further optional accessories may be required. Contact your specialist wholesaler to discuss your specific needs.
Bosch offers an extensive range of original equipment quality spare parts for affordable vehicle repairs. Further spare parts can be found in ESI[tronic] 2.0 Online.

**Spare parts example**

**Supply module 2.1**

- **The control unit** in the supply module is used to regulate the cooling of the dosing module.
- **The filter** reliably cleans the AdBlue from particles and thus supports optimal dosing.
- **The membrane pump** in the supply module generates the required system pressure and delivers the AdBlue reducing medium from the tank to the dosing module via the supply module.
- **The 4/2-way valve** controls the flow direction of the AdBlue.
- **Wiring harness**
- **Dosing control unit**

*depending on the Denoxtronic system*
Technical training
Overview

For commercial vehicle workshops, trained employees are a great asset because vehicles today are increasingly complex and new technologies present new challenges. Only with the necessary expertise, is it possible for workshop employees to carry out diagnosis, maintenance, and service work on current vehicle models effectively and cost-effectively.

Training content and goals
In the special diesel technology and the exhaust-gas treatment system training courses, technicians are taught the professional testing of components and systems using KTS and ESI[tronic] in conjunction with the Denoxtronic test kit. It is also possible to learn how to repair Denoxtronic modules 1 and 2. Since construction and agricultural machinery are increasingly being equipped with Denoxtronic, the training offer has been developed accordingly. For example, independent troubleshooting and fault resolutions on SCR systems or the exhaust-gas treatment of construction and agricultural machinery can be taught.

28 Training center around the world

5259 training courses with 265,314 training participants worldwide in 2019

521 practical training courses on various disciplines in the offer

107 courses relating to diesel and exhaust-gas treatment

Information on current training offer can be found under: boschaftermarket.com
What drives you, drives us

Bosch technologies are used worldwide in almost all vehicles. People, and assuring their mobility, is what we are focused on.

To them, we dedicate 130 years of pioneering spirit and expertise in research and manufacturing.

And it is for them that we continue to work constantly to develop unique combinations of spare parts, diagnostics solutions and services:

- Solutions for efficient and effective vehicle repairs
- innovative workshop equipment and software
- one of the largest spare parts offerings for new and replacement parts worldwide
- large dealership network for quick and reliable parts supply
- competent technical support
- comprehensive educational and training offerings
- targeted sales and marketing support

Learn more now: boschaftermarket.com

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