



A tidy affair: Emission Analysis



BEA 850
Powered by **ESI[tronic]**



BOSCH

Invented for life

Effective **emission analysis** of today's vehicles

- ▶ BEA 850 – Emission analysis (PC-based)
- ▶ BEA 150 / 250 / 350 – Emission analysis (embedded)
- ▶ BEA 460 – Emission analysis (modular)
- ▶ BDM 298 / 300 – Speed measurement modules



Clean work in a very short space of time with the Bosch emission analysis



Emission analysis with BEA 850

Testing and minimizing pollutant emissions with modular measurement technology – in accordance with the latest legislation and with highest measurement accuracy. The workshop requires robust, future-proof technology to achieve this, with clear operator guidance and simple handling. The emission analysis instruments from Bosch test equipment excel through their easy and timesaving handling. Other particularly important aspects in the daily handling of exhaust-gas analysers are the short run-up times and brief measuring times.

The triumphant progress of the diesel engine

The increasing acceptance of the diesel engine is accompanied by expanded legal requirements for exhaust gas restriction and analysis. Technical innovations helped to significantly reduce the exhaust-gas values of today's diesel engines. The exact emissions measurement and adjustment by the workshop is increasingly becoming more significant to observe the new legal standards in practice.

Emission analysis for gasoline engines

The future engine for the average consumer will continue to be the gasoline-powered engine. With constantly optimized cleanliness values that can be measured quickly and conveniently using the Bosch emission analysis.

Much more than only an exhaust-gas test

Bosch provides the workshop with the complete spectrum from simple exhaust gas examination up to the complete emission system analysis:

- ▶ The exhaust-gas analyser for exhaust-gas examination
- ▶ The exhaust-gas diagnostics system for error diagnosis
- ▶ The modular expandable exhaust gas maintenance system for the efficient workshop

All devices are highly efficient with customer-conforming documentation of the measurement and diagnostic results. They are all easy to operate. With their modular design, high quality standard and innovative measurement technology, they always offer a future-proof investment.

The exhaust-gas and diagnostics station of the future BEA 850



The BEA 850 at a glance:

- ➊ **TFT monitor 19"**: Glare-free, high resolution and with a wide viewing angle
- ➋ **Remote control**: Practical and handy
- ➌ **Printer**: With dustproof cover
- ➍ **Engine measurement technology module**: With clearly arranged mounting for all sensors and cables
- ➎ **Smoke-opacity testing module**: Immediately ready to measure, reference device for registration authorities in various European countries
- ➏ **Keyboard**: Ergonomic position and can be folded away
- ➐ **Computer module (PC)**: High-performance and robust
- ➑ **Exhaust measurement module**: Low maintenance thanks to long-term stability
- ➒ **Trolley**: Stable and easy to move
- ➓ **OBD and ECU Diagnosis** choose from KTS 570 / 540 / 515 wireless or 530

A variable system for gasoline and diesel vehicles

Testing and minimizing pollutant emissions with modular measurement technology – in accordance with the latest legislation and with high measurement accuracy.

- ▶ Optimized for current and future requirements of exhaust tests
- ▶ Integrated on-board diagnostics (OBD) with ECU diagnostics testers of the KTS series (KTS 570 / 540 / 530 wireless or 515)
- ▶ Integrated on a workshop-compatible trolley
- ▶ 4-gas module with optional NO
- ▶ Very rapid response time
- ▶ Gas detectors with high measurement accuracy and long-term stability
- ▶ Simple equipment maintenance by workshop staff
- ▶ User-oriented documentation of the measurement and diagnostics results
- ▶ Software-controlled integration of older Bosch exhaust-gas analyzers
- ▶ Network-compatible (integration in asanetwork)

Exhaust-gas test and diagnostics on a gasoline-engine vehicle

- ▶ On-board diagnostics OBD
- ▶ Gas values CO, CO₂, O₂, HC, lambda, NO (option)
- ▶ Lambda sensor voltage (graphical display)
- ▶ Moment of ignition and dwell angle, advance angle
- ▶ Speed measurement
- ▶ Oil temperature measurement
- ▶ Multiple curves: Up to 6 measured variables can be shown simultaneously as a curve: CO, CO₂, O₂, HC, lambda, NO (option), speed, moment of ignition, dwell angle, oil temperature and battery voltage

Exhaust-gas test and diagnostics on a diesel-engine vehicle

- ▶ Smoke-opacity testing during free acceleration
- ▶ On-board diagnostics OBD
- ▶ Continuous smoke-opacity testing
- ▶ Start-of-delivery measurement including determination of advance angle, reference angle and reference speed
- ▶ Speed measurement
- ▶ Oil temperature measurement
- ▶ Multiple curves: Up to 5 measured variables can be shown simultaneously as a curve: Smoke opacity, speed, start of delivery, advance angle and oil temperature

BEA 850 with engine speed measurement module **BDM 300**



Effective emission analysis of vehicles



KTS 540 wireless for ECU Diagnosis

Equipment supply

Trolley, PC, keyboard, mouse, TFT monitor 19", inkjet printer, MTM extended, BDM 300, remote control, BEA 050, RTM 430, sensors (trigger clamp, passenger car temperature sensor, multipurpose test cable, term. 1/term 15 cable), emission test data and, as an option, KTS 570 / KTS 540 wireless or KTS 515

Special accessories

Protection hood, ignition stroboscope, temperature sensor for trucks, infrared temperature sensor, clamp-on pulse generator (4.5/5.0/6.0/7.0/10.0/12.7 mm), exhaust-gas probe for cars/trucks, NO retrofit kit, heating hose, clamping device, connecting cable RTM (12 m), adapter cable with change part OBD, adapter cable and connecting cables for clamp-on pulse generator

Specifications and standards

International: OIML -R99 Class 0 (Edition 1998)
Measurement technology complies with ECE R24
EU: CE Conformity Authorizations for statutory exhaust-gas testing in various European countries

Order number

BEA 850 with KTS 570 & BDM 300 (Ger) 0 684 120 090
BEA 850 with KTS 540 & BDM 300 (Ger) 0 684 120 089
BEA 850 with KTS 515 & BDM 300 (Ger) 0 684 120 099
BEA 850 without KTS with BDM 300 (Ger) 0 684 120 088
BEA 850 with KTS 515 (UK) 0 684 120 085

Technical data	
Dimensions (W x H x D)	680 x 1785 x 670 mm
Weight	approx. 125 kg
Power supply	90 – 264 VAC / 47 – 63 Hz
Operating temperature range	5 °C to 40 °C

Designation	Measuring range	Resolution
Exhaust measurement module		
CO	0 – 10 % vol.	0.001 % vol
CO ₂	0 – 18 % vol	0.01 % vol
HC	0 – 9999 ppm	1.0 ppm
O ₂	0 – 22 % vol	0.01 % vol
NO	0 – 5000 ppm	1.0 ppm
Lambda	0.5 – 1.8	0.001
CO _{vrai}	0 – 10 %	0.01 %
Accuracy according to OIML class 0		
Smoke-opacity measurement module		
Degree of opacity	0 – 100 %	1 %
Absorption coefficient	0 – 10 m ⁻¹	0.01 m ⁻¹
Maximum exhaust-gas temperature at:	– exhaust-sample probe: 250 °C – input RTM 430: 200 °C	
Engine measurement technology		
Battery voltage	0 – 72 V	0.1 V
Moment of ignition	0 – 60° kW	0.1° kW
Dwell angle	0 – 100 %	0.1 %
Oil temperature	-20 – +150 °C	0.16 °C
Start of delivery/ injection timing	0 – 60° kW	0.1° kW
Speed, gasoline engine		
BDM (B+/B-)	450 – 6000 rpm	20 rpm
Terminal 1/TD/TN/EST	100 – 12000 rpm	10 rpm
Trigger clamp	100 – 12000 rpm	10 rpm
Speed, diesel engine		
BDM (B+/B-)	450 – 6000 rpm	20 rpm
Clamp-on sensor	250 – 7200 rpm	10 rpm
Terminal 1/TD/TN/EST	100 – 12000 rpm	10 rpm
Trigger clamp	100 – 12000 rpm	10 rpm

Bosch emission analysis for a **clean** environment – BEA 150 / 250 / 350



BEA 350

With the Bosch Emission Analysis BEA, the work-shop is perfectly prepared for all present and future exhaust-gas analysis requirements. The modular layout of the BEA series permits expansion completely in line with individual workshop requirements: For reliable and fast emission measurement of gasoline, diesel and gas engines.

For statutory exhaust test and diagnostics on gasoline and / or diesel vehicles

- ▶ OBD function¹
- ▶ Vehicle database¹
- ▶ Additional measurement functions: Lambda sensor voltage, start of delivery, moment of ignition
- ▶ Measurement accuracy according to OIML R99, class 0
- ▶ Individual devices – gasoline or diesel can be upgraded to complete exhaust test station BEA 350
- ▶ Can be networked via asanetwork¹
- ▶ AU-Plus¹

BEA 150 – for emissions testing on diesel engine vehicles (car, van)

- ▶ Portable smoke opacity measurement module RTM
- ▶ Very fast measurement (response time)
- ▶ Long service life of measuring chamber
- ▶ Fast, simple maintenance due to magnetic fasteners
- ▶ Optimum flow technology of smoke opacity module

BEA 250 – for emissions testing on petrol engine vehicles

- ▶ Calibration only once a year
- ▶ Fast maintenance: filter is easily accessible (back)
- ▶ Long-term stability due to infrared measurement method with gas detectors as receivers
- ▶ Quick measurement readiness on activation

BEA 350 – for emissions testing on diesel and petrol engine vehicles

- ▶ Complete exhaust test station
- ▶ Optimized price composed of BEA 150 and 250

¹ Dependent on country-specific software

Equipment supplied	BEA 150	BEA 250	BEA 350
Suitable for exhaust test on	diesel engines	gasoline engines	diesel- and gas. engines
Bosch Emissions Analysis			
Operating and display unit	✓	✓	✓
PC keyboard	✓	✓	✓
Trolley	✓	✓	✓
Software process (country-specific)	✓	✓	✓
Vehicle database ²	✓	✓	✓
Connection cable B+ / B-	✓	✓	✓
Oil temperature sensor, cars ²	✓	✓	✓
Smoke opacity measuring module RTM 430, with car hose and sensor	✓	–	✓
Exhaust measurement module BEA 050, including hose and sensor	–	✓	✓
IR remote control	✓	–	✓

² Scope of supply Germany

Special accessories

Vehicle emissions data, sensor holder, NO retrofit kit, printer paper for installed printer, DIN A4 printer, protection hood, BEA 150 / 250 / 350 Edition retrofit kit, tool tray, remote control, sampling probes and sampling hoses for trucks, diesel clamp-on sensor, adapter and connection cables, trigger clamp, ignition stroboscope, oil temperature sensor for trucks, upgrade from BEA 150 / 250 to BEA 350 and OBD upgrade (KTS 115 OBD module)

Specifications and standards

International: OIML-R99 Class 0

EC: CE Conformity

National (D): EGE guideline dated 23 June 1994 PTB appendix 18.9 for diesel, 18.10 for gasoline

Order number

BEA 150 (Germany / Austria)	0 684 105 169
BEA 250 (Germany / Austria)	0 684 105 269
BEA 350 (Germany / Austria)	0 684 105 369
BEA 150 (Switzerland)	0 684 105 153
BEA 250 (Switzerland)	0 684 105 253
BEA 350 (Switzerland)	0 684 105 353
BEA (EURO diesel)	0 684 105 170
BEA (EURO gasoline)	0 684 105 272
BEA (EURO combi)	0 684 105 372
BEA (Romania diesel)	0 684 105 160
BEA (Romania gasoline)	0 684 105 260
BEA (Romania combi)	0 684 105 360
BEA (Finland diesel)	0 684 105 158
BEA (Finland gasoline)	0 684 105 258
BEA (Finland combi)	0 684 105 358
BEA (France diesel)	0 684 105 151
BEA (France gasoline)	0 684 105 251
BEA (France combi)	0 684 105 351
BEA (Italy diesel)	0 684 105 152
BEA (Italy gasoline)	0 684 105 252
BEA (Italy combi)	0 684 105 352
BEA (Italy motorcycle)	0 684 105 265
BEA (Italy combi for police)	0 684 105 366
BEA (China gasoline)	1 687 001 537
BEA (Netherlands diesel)	0 684 105 155
BEA (Netherlands gasoline)	0 684 105 255
BEA (Netherlands combi)	0 684 105 355
BEA (Poland diesel)	0 684 105 171
BEA (Poland gasoline)	0 684 105 271
BEA (Poland combi)	0 684 105 371
BEA (England diesel)	0 684 105 161
BEA (England gasoline)	0 684 105 261
BEA (England combi)	0 684 105 361

Component	Measurement range	Resolution
Exhaust measurement module		
CO	0,000 – 10,00 % vol	0,001 % vol
CO ₂	0,00 – 18.00 % vol	0,01 % vol
HC	0 – 9999 ppm	1 ppm
O ₂	0,00 – 22.00 % vol	0,01 % vol
Lambda	0,500 – 9,999	0,001
NO	0 – 5000 ppm	< = 1 ppm
Measured quantity	Measurement range	Resolution
Smoke-opacity measurement module		
Degree of opacity	0 – 100 %	1 %
Oil temperature		
Temperature	-20 – +150 °C	0,16 °C
Speed, gasoline engine		
BDM (B+ / B-)	600 – 6000 rpm	10 rpm
Terminal 1 / TD / TN / EST	100 – 15000 rpm	10 rpm
Trigger clamp	100 – 15000 rpm	10 rpm
Speed, diesel engine		
BDM (B+ / B-)	600 – 6000 rpm	10 rpm
Clamp-on sensor	250 – 7200 rpm	10 rpm
Terminal 1 / TD / TN / EST	100 – 15000 rpm	10 rpm
Trigger clamp	100 – 15000 rpm	10 rpm
Multi-measurements		
Lambda-sensor voltage	± 5 V	10 mV
Moment / adjustment of ignition		
OT Reference mark sensor against trigger clamp	-179 – 180° kW at 100 – 8000 rpm	0,1° kW
Dwell angle		
Terminal 1	0 – 100 % 0 – 360° VW	0,1% 0,1%
Start of delivery / injection timing		
Clamp-on sensor against OT or strobe	-179 – 180° kW	0,1° kW
Technical data		
Dimensions (W x H x D)	For all BEA variants with trolley 750 x 1370 x 700 mm operating and display unit 470 x 260 x 480 mm	
Weight	BEA 350 (incl. trolley) BEA 250 (incl. trolley) BEA 150 (incl. trolley) RTM 430	app. 67 kg app. 60 kg app. 63 kg app. 7 kg
Protection classes	Operating and display unit IP 30 Smoke-opacity measurement module RTM 430 IP 33	
Range of accuracy	+5 °C – +40 °C	
Functional range	+5 °C – +45 °C	
Storage temperature	-25 °C – +60 °C	
Power supply	230 V, 50 Hz	

BEA 460 – the **modular** solution for the exhaust-gas test



The BEA 460 is the ideal introductory tool for the statutory exhaust-gas test. The device was developed in cooperation with an automotive inspection agency and prepares the workshop for all current and future exhaust-gas analysis requirements. The modular concept can be extended to a complete ECU Diagnosis system. Operation is either wireless or by means of a cable connection to a PC or notebook¹.

BEA 460 – the efficient solution for the exhaust-gas test

- ▶ Impact-protection and robust - for daily use in the workshop
- ▶ Manageable and portable device (weight < 15 kg)
- ▶ Available with on-board diagnostics (OBD)
- ▶ Fast measurement thanks to optimized software
- ▶ 4-gas measurement with optional NO
- ▶ Simple operation thanks to help function in the software
- ▶ Gas detectors with high measurement accuracy and long-term stability
- ▶ Semiannual maintenance sufficient
- ▶ With portable smoke opacity measurement module RTM 430
- ▶ Quick measurement readiness on activation
- ▶ Bluetooth connection between BEA 460 and notebook (alternatively, a cable connection is also possible)
- ▶ Bluetooth connection between notebook and KTS (alternatively, a cable connection is also possible)

¹ PC/notebook not included in equipment supply

Equipment supply

Smoke opacity measurement module RTM 430 incl. exhaust-gas hose and sensor for pass. cars, 4-gas measuring instrument (without OBD) including exhaust-gas hose and sensor for pass. cars, connecting cable for vehicle socket, temperature probe for pass. cars, connecting cable KI1/TN/TD/EST and B+/B-, trigger clamp, 2 Bluetooth sticks (for 4-gas device and PC), engine measuring technology (temperature and speed), serial cable (PC / notebook and 4-gas device), serial / USB converter, USB remote control²

Additionally available for the version with KTS:
Adaption cable OBD 5 m

² Not included in the gas model





Special Accessories

Remote control¹, NO retrofit kit, retrofit kit for motorcycle exhaust-gas test, sampling hose set for 2-stroke engines, sample probe for trucks, clamping device with telescopic rod, various connecting cables for clamp-on sensor, connecting cable for lambda sensor voltage, trolley

¹ already included in delivery with the station wagon models

Specifications and standards

International: OIML-R99 Class 0

EU: CE Conformity

MID certification for the 4-gas device

Certification dependent on country-specific software

Order number

BEA 460 combination without OBD (Ger) 0 684 105 461

BEA 460 combination with int. OBD (Ger) 0 684 105 462

BEA 460 gasoline without OBD (Ger) 0 684 105 465

BEA 460 diesel without OBD (Ger) 0 684 105 467

BEA 460 gasoline Europe without OBD 0 684 105 468

BEA 460 combin. Europe without OBD 0 684 105 469

Technical data	
Dimensions (W x H x D)	470 x 250 x 400 mm
Weight incl. sensors and engine measuring technology	< 15 kg
Operation	via workshop PC or notebook
Supply voltage power unit	90 – 264 VAC / 47 – 63 Hz
Service temperature range	5 °C to 40 °C

Component	Measurement range	Resolution
Exhaust measurement module		
CO	0 – 10% vol.	0,001% vol.
CO ₂	0 – 18% vol.	0,010% vol.
HC	0 – 9999 ppm	1,0 ppm
O ₂	0 – 22% vol.	0,010% vol.
NO	0 – 5000 ppm	1,0 ppm
Lambda	0,5 – 1,8	0,001
CO _{vrai}	0 – 10% vol.	0,010%

Sensor	Measurement range	Resolution
Temperature	-20 – +150 °C	0,16 °C
Speed, gasoline engine		
BDM (B+/B-)	450 – 6000 rpm	20 rpm
Terminal 1/TD/TN/EST	100 – 12000 rpm	10 rpm
Trigger clamp	100 – 12000 rpm	10 rpm
Speed, diesel engine		
BDM (B+/B-)	450 – 6000 rpm	20 rpm
Clamp-on sensor	250 – 7200 rpm	10 rpm
Moment / adjustment of ignition		
Stroboscope with trigger clamp	0 – 60° kW	0,1° kW
Dwell angle		
Terminal 1	0 – 100% 0 – 360° VW 0,0 – 50,0 ms 50,0 – 99,9 ms	0,1% 0,1 ° 0,01 ms 0,1 ms
Start of delivery / injection timing		
Clamp-on sensor or stroboscope	0 – 60° kW	0,1° kW

The **practical** speed measuring modules BDM 298 and BDM 300



BDM 298



BDM 300

The engine speed measurement modules BDM 298 and BDM 300 enable speed indication on a wide variety of diagnosis devices from Bosch

- ▶ Speed sensing on diesel and gasoline engines
- ▶ No lowering of driver cab for commercial vehicles
- ▶ Time saved on passenger car / commercial vehicle motors due to simple adaptation

BDM 298

Quick and easy speed sensing via the electrical system. Adaptation and speed detection via battery-cable terminals or cigarette lighter.

Equipment supply

Speed measurement module BDM 298, connecting cable for cigarette lighter, adapter cable with battery-cable terminal

Accessories

Various connection cables available on request

Order number

BDM 298 1 687 023 298

Technical data	BDM 298
Speed range	300 – 6000 rpm
Number of cylinders	1 – 12
Engine types	Four-stroke engines
Operating voltage	9 – 32 V
Connection options	Cigarette lighter or battery
Starts measuring	Automatically

BDM 300

Rapid speed sensing from the structure-borne sound and airborne sound signal of the engine.

Equipment supply

Engine speed measurement module BDM 300, mains adapter, combined sensor, connecting cable for terminal encoder signal (diesel), operating instructions

Accessories

2-stroke / 4-stroke changeover switch 1 687 200 711

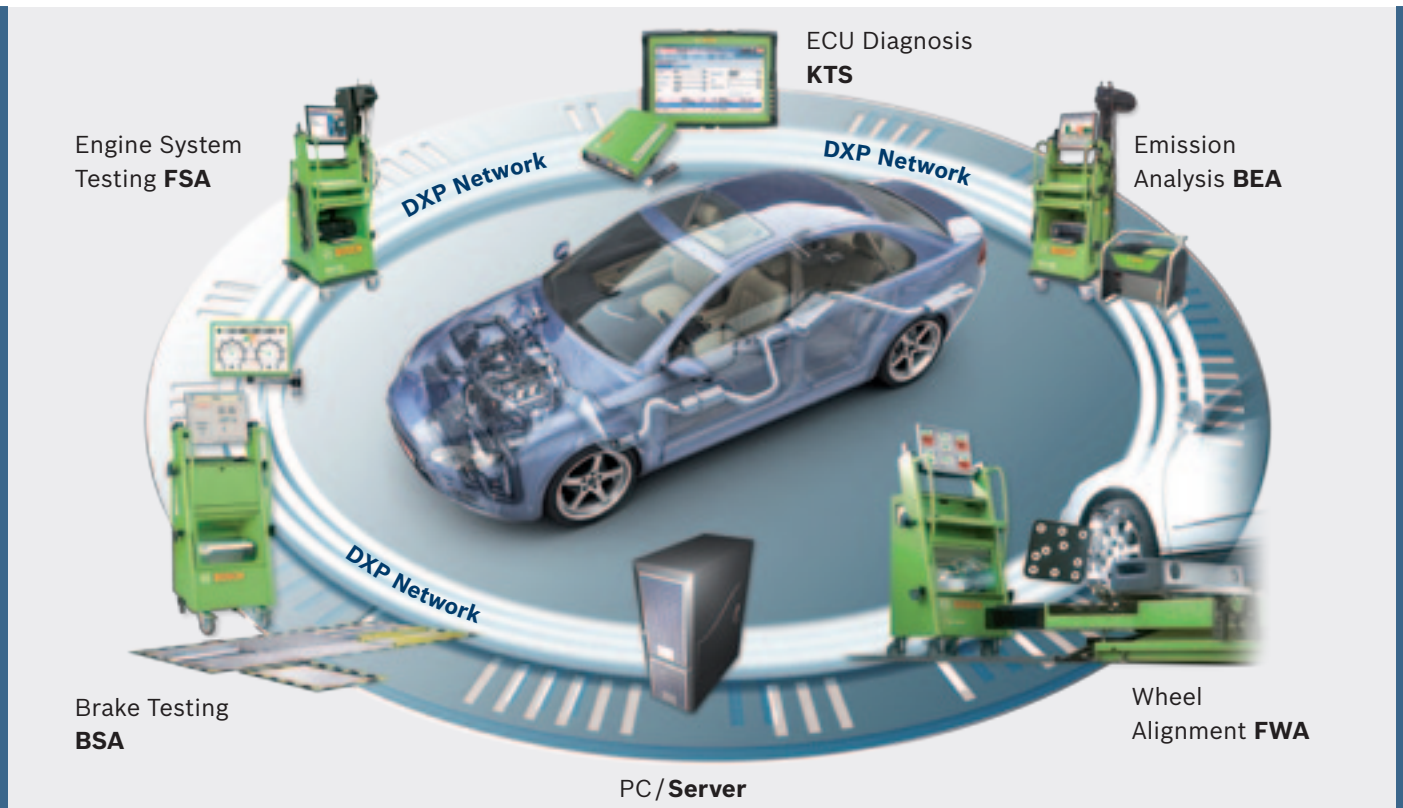
Order number

BDM 300 1 687 023 489

Technical data	BDM 300
Speed, diesel engines	400 rpm – 6000 rpm
Speed, gasoline engines	400 rpm – 8000 rpm

Measurement function	Vehicle type	Speed search range
Idle speed	Pass. car / comm. vehicle	400 rpm – 1200 rpm
Increased speed		1700 rpm – 6000 rpm
Idle speed	Motorcycle 4 stroke	600 rpm – 1800 rpm
Increased speed		2200 rpm – 8000 rpm
Idle speed	Motorcycle 2 stroke	900 rpm – 2200 rpm
Increased speed		1800 rpm – 8000 rpm

Data Exchange Platform DXP for even more economical processes in the workshop



New! Data Exchange Platform DXP – the efficient workshop software from Bosch

- ▶ Networking of all diagnostic devices
- ▶ Fast, simple, reliable data exchange between all PC-based testers in the workshop
- ▶ Direct activation of the ECU diagnosis (KTS) from every DXP-networked test system
- ▶ Central storage of identification data and result records and exchange with the Workshop Management System (WMS)

Once recorded – accessible at any time, and everywhere

DXP from Bosch transfers all vehicle data recorded by a system to all other diagnostic systems integrated in the DXP network. Once identified, input of the license plate number or VIN (Vehicle Identification Number) is sufficient to call up the vehicle data at all workstations. This saves time. All testers from Bosch, Beissbarth and Sicam have networking-capability.

The technical requirements

Any modern PC can be used as a server. Bosch recommends the use of a separate preconfigured server. An interface makes connection to many Workshop Management Systems possible.

Benefits to the workshop

- ▶ More efficient due to simplified processes and short setup times
- ▶ No duplicated work thanks to one-time vehicle identification
- ▶ Easier subsequent identification saves time
- ▶ Central access to ECU Diagnosis from every test system
- ▶ Customer-friendly through rapid processing of order data and results
- ▶ Transparent and service-oriented, standardized test records
- ▶ A database for the entire vehicle history with all test results

Minimum requirements for PC or notebook

The software can be installed on every PC in the workshop.

- ▶ Dual Core processor
- ▶ At least 2 GB main memory
- ▶ At least 150 GB hard-disk memory

Bosch: bringing you the workshop of the future

For over 120 years, Bosch innovations have been keeping vehicles on the road and getting people to and from their destinations while improving safety and peace of mind along the way.

Bosch Automotive Aftermarket offers workshops and retailers a comprehensive portfolio of products that is unmatched worldwide:

- ▶ Efficient diagnostics
- ▶ Innovative workshop equipment
- ▶ Quick, reliable delivery
- ▶ The world's most comprehensive range of spare parts – including both new and remanufactured
- ▶ Workshop concepts to meet every requirement
- ▶ Comprehensive training
- ▶ Targeted sales and marketing support
- ▶ A competent service hotline
- ▶ 24-hour online workshop services
- ▶ Affordable leasing services for workshop equipment and software

From parts to scheduling, organization and results, our solutions are combined with additional services to ensure your needs will be perfectly met, helping you to maximize your potential.

Workshop tip:

The emission analysis from Bosch is exactly tuned to developments in gasoline, gas and diesel drives. Workshops benefit from the know-how, the high market coverage and the extensive Bosch product range – e.g. spark plugs and lambda sensors.

Diagnostics and parts: you only find both at Bosch.

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Premium quality spark plugs and oxygen sensors from Bosch

Superior technology and high dependability: from original equipment through motor racing to the spare parts market. Bosch always delivers quality.



BOSCH

Invented for life