



A tidy affair: Emissions Analysis



BOSCH

Invented for life

Bosch Diagnostics

ESI[tronic]
Software

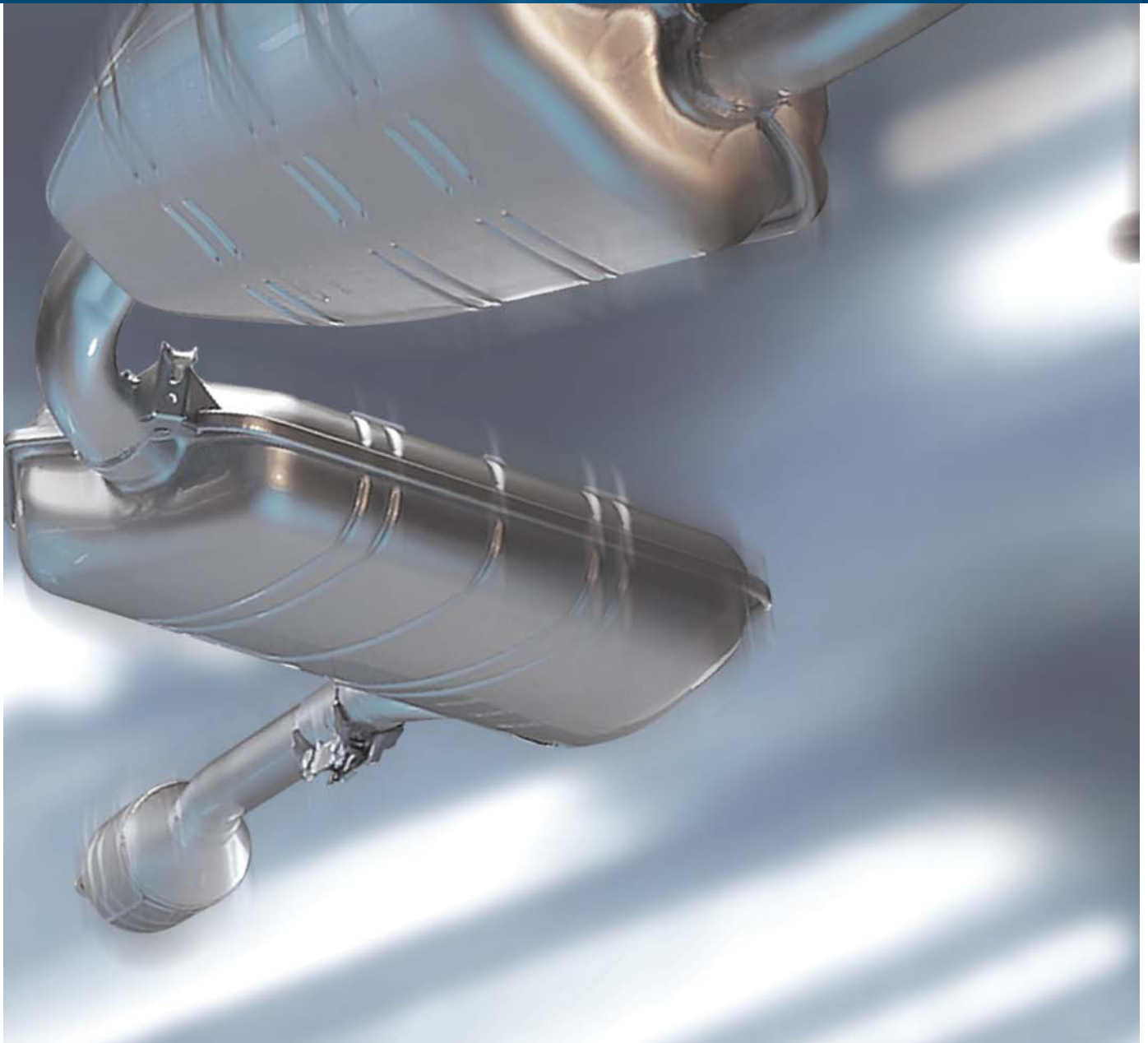
Test
Equipment

Service
Training

Technical
Hotline

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

- BEA 850
 - BEA 150/250/350
 - BEA Mobil
 - BDM 298
- Emission Analysis (PC-based)
 - Emission Analysis (embedded)
 - Mobile Emission Analysis
 - Speed Measuring Module



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 new emission analysis instruments from Bosch test technology excel through their easy and timesaving handling. Other particularly important aspects in the daily handling of exhaust-gas measuring instruments 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 measuring system 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:

- 1 **TFT monitor 17"**: Glare-free, high resolution and with a wide viewing angle
- 2 **Remote control**: Practical and handy
- 3 **Printer**: With dustproof cover
- 4 **Engine measurement technology module**: With clearly arranged mounting for all sensors and cables
- 5 **Smoke-opacity testing module**: Immediately ready to measure, reference device for registration authorities in various European countries
- 6 **Keyboard**: Ergonomic position and can be folded away
- 7 **Computer module (PC)**: High-performance and robust
- 8 **Exhaust measurement module**: Low maintenance thanks to long-term stability
- 9 **Trolley**: Stable and easy to move
- 10 **OBD and ECU Diagnostics** choose from KTS 570/540 wireless or 115

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 or 115)
- 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



Effective emission analysis of vehicles



KTS 540 wireless for ECU diagnostics

Special accessories

Protection hood, ignition stroboscope, temperature sensor, 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, 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

Equipment supplied

Trolley, PC, keyboard, mouse, TFT monitor 17", inkjet printer, MTM extended, BEA 050, RTM 430, sensors (trigger clamp, passenger car temperature sensor, multi-purpose test cable, term. 1/term 15 cable), emission test data and, as an option, KTS 570, KTS 540 or KTS 115, remote control.

Specifications and standards

International: OIMLR99 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 | 0 684 120 058 |
| BEA 850 with KTS 540 | 0 684 120 057 |
| BEA 850 with KTS 115 | 0 684 120 050 |
| BEA 850 without KTS | 0 684 120 055 |

Technical data

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

Exhaust measurement module

| Designation | Measuring range | Resolution |
|--------------------|-------------------|--------------|
| CO | 0 – 10 % vol. | 0.001 % vol |
| CO ₂ | 0 – 18 % vol | 0,01 % vol |
| HC | 0 – 9999 ppm vol | 1.0 ppm vol |
| O ₂ | 0 – 22 % vol | 0,01 % vol |
| NO | 0 – 5000 ppm vol. | 1.0 ppm vol. |
| Lambda | 0.5 – 1.8 | 0.001 |
| CO _{vrai} | 0 – 10 % | 0.01 % |

Accuracy according to OIML class 0

Smoke-opacity measurement module

| Designation | Measuring range | Resolution |
|------------------------|------------------------|----------------------|
| 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

| Designation | Measuring range | Resolution |
|--|-----------------|------------|
| Battery voltage | 0 – 72 V | 0.1 V |
| Moment of ignition | 0 – 60° cks | 0.1° cks |
| Dwell angle | 0 – 100 % | 0.1 % |
| Oil temperature | -20 – +150 °C | 0.16 °C |
| Start of delivery/ injection timing | 0 – 60° cks | 0.1° cks |
| 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 workshop 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 function*
- Vehicle database*
- 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 asanetwork*
- AU-Plus

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

* dependent on country-specific software

Equipment supplied

| Bosch Emissions Analysis | BEA 150 | BEA 250 | BEA 350 |
|---|------------------|-----------------|------------------|
| Suitable for emissions diesel testing on | gasoline engines | diesel/ engines | gasoline engines |
| Operating and display unit | ✓ | ✓ | ✓ |
| PC keyboard | ✓ | ✓ | ✓ |
| Trolley | ✓ | ✓ | ✓ |
| Software process (country-specific) | ✓ | ✓ | ✓ |
| Vehicle database | ✓ | ✓ | ✓ |
| Connection cable B+/B- | ✓ | ✓ | ✓ |
| Oil temperature sensor for pass. car** | ✓ | ✓ | ✓ |
| Smoke-opacity measurement module RTM 430, with passenger car hose and probe | ✓ | --- | ✓ |
| Exhaust-gas measurement module BEA 050, incl. hose and probe | --- | ✓ | ✓ |
| IR remote control | ✓ | --- | ✓ |

** German scope of supply

Special accessories

Vehicle emissions data, sensor holder, NO retrofit kit, printer paper for installed printer, DIN A4 printer, tool tray, remote control, sampling probes and sampling hoses, diesel clamp-on sensor, adapter and connection cables, trigger clamp, ignition stroboscope, oil temperature sensor, 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 350 | 0 684 105 350** |
| BEA 250 | 0 684 105 250** |
| BEA 150 | 0 684 105 150** |

** German version

Technical data

| | | |
|---------------------|---|------------|
| Dimensions | For all BEA variants with trolley (W x H x D in mm) 750 x 1370 x 700 operating and display unit (W x H x D in mm) 470 x 260 x 480 | |
| Weight | BEA 350 (incl. trolley) | app. 67 kg |
| | BEA 250 (incl. trolley) | app. 60 kg |
| | BEA 150 (incl. trolley) | app. 63 kg |
| | RTM 430 | 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 | |

Measurement ranges, accuracy

| Exhaust measurement module | | |
|----------------------------|---------------------|---------------|
| Component | Measurement range | Resolution |
| CO | 0,000 – 10,00 % vol | 0,001 % vol |
| CO ₂ | 0,00 – 18,00 % vol | 0,01 % vol |
| HC | 0 – 9999 ppm vol | 1 ppm vol |
| O ₂ | 0,00 – 22,00 % vol | 0,01 % vol |
| λ | 0,500 – 9,999 | 0,001 |
| NO | 0 – 5000 ppm vol | < = 1 ppm vol |

| Smoke-opacity measurement module | | |
|----------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Degree of opacity | 0 – 100 % | 0,1 % |

| Oil temperature | | |
|-------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Temperature | -20 – +150 °C | 0,16 °C |

| Speed, gasoline engine | | |
|------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| 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 | | |
|----------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| 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 | | |
|-----------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Lambda-sensor voltage | ± 5 V | 10 mV |

| Moment/adjustment of ignition | | |
|-------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| OT Reference mark sensor | -179 – 180° kW at | 0,1° kW |
| against trigger clamp | 100 – 8000 rpm | |

| Dwell angle | | |
|-------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Terminal 1 | 0 – 100 % | 0,1% |
| | 0 – 360° VW | 0,1° VW |

| Start of delivery/injection timing | | |
|--------------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Clamp-on sensor against OT or strobe | -179 – 180° kW | 0,1° kW |

Mobile emission analysis

BEA Mobile



BEA Mobile



Emission analysis with the BEA Mobile on the vehicle

The exhaust-gas testing device that can be rolled quickly and easily beside the car, or even fits in the vehicle interior: BEA Mobile, in connection with a workshop PC or laptop, provides the practical and timesaving solution to mobile emission analysis of gasoline and diesel-engine vehicles.

Functions and advantages for the workshop

- Suitable for statutory exhaust test on gasoline and diesel vehicles
- BEA Mobile – easy to transport on rollers
- Short equipping times, sensors remain connected during transport
- Easy and quick to stow in the vehicle
- OBD in the equipment supplied*
- Powerful software exhaust test + OBD + diagnostics*
- can be networked via asanetwork*
- Device color available as RAL 5002 (ultramarine-blue) or RAL 6018 (yellow-green)

Equipment supplied

Basic unit incl. exhaust-gas measurement module for gasoline and diesel vehicles, software, IR remote control, OBD interface, speed measurement (battery, TN/TD, clip-on trigger sensor), oil temperature probe (immersion depth 0.8 m)

A PC/laptop is required to operate the BEA Mobile. It is not part of the equipment supplied. Detailed information about PC operating system and ESA system software is available from your sales partner.

* dependent on country-specific software

Specifications and standards

International: OIMLR99 Class 0
 EC: CE Conformity
 National (D): EGE guideline dated 23 June 1994 PTB appendix 18.9 for diesel, 18.10 for gasoline

Special accessories

Oil temperature sensor (immersion depth up to 2.1 m)

Order number

BEA Mobile RAL 5002 (ultramarine-blue) 0 684 105 450

BEA Mobile RAL 6018 (yellow-green) 0 684 105 451

Further colors available on request

Technical data

| | |
|--------------------|---|
| Housing dimensions | Engine measurement technology and sensor system 420 x 415 x 219 mm Exhaust-gas measurement technology 420 x 415 x 300 mm |
| Weight | Engine measurement technology and sensor system 10.5 kg Exhaust-gas measurement technology 17 kg |
| Operation | Notebook (WIN ME/XP) |
| Software | Emissions System Analysis (ESA) with BEA functions |
| Networking | via notebook (same as BEA 850) |
| IR remote control | at the laptop via external keyboard input |
| Interfaces | one serial RS 232 to the notebook, OBD, speed (various sensors), oil temperature, ZYP (dwell angle, start of delivery), Lambda sensor voltage |

Measurement ranges, accuracy

| Exhaust measurement module | | |
|----------------------------|--------------------|---------------|
| Component | Measurement range | Resolution |
| CO | 0,00 – 10,00 % vol | 0,001 % vol |
| CO ₂ | 0,00 – 18,00 % vol | 0,01 % vol |
| HC | 0 – 9999 ppm vol | 1 ppm vol |
| O ₂ | 0,00 – 22,00 % vol | 0,01 % vol |
| λ | 0,500 – 9,999 | 0,001 |
| NO | 0 – 5000 ppm vol | < = 1 ppm vol |

| Smoke-opacity measurement module | | |
|----------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Degree of opacity | 0 – 100 % | 0,1 % |

| Oil temperature | | |
|-------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Temperature | -20 – +150 °C | 0,16 °C |

| Speed, gasoline engine | | |
|------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| 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 | | |
|----------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| 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 | | |
|-----------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Lambda-sensor voltage | ± 5 V | 10 mV |

| Moment/adjustment of ignition | | |
|-------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| OT Reference-mark sensor | -179 – 180° kW at | 0,1° kW |
| to trigger clamp | 100 – 8000 rpm | |

| Dwell angle | | |
|-------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Terminal 1 | 0 – 100 % | 0.1 % |
| | 0 – 360° VW | 0.1° VW |

| Start of delivery/injection timing | | |
|--------------------------------------|-------------------|------------|
| Measured quantity | Measurement range | Resolution |
| Clamp-on sensor against OT or strobe | -179 – 180° kW | 0,1° kW |

The **practical** speed measuring module BDM 298



Simple to install, trouble-free sensing: Speed measurement with the BDM 298 from Bosch, supplied with the necessary energy from the vehicle electrical system.

Quick and easy speed sensing via the electrical system.

The speed measurement module BDM 298 enables display of the speed on a wide variety of diagnostic devices

- Quick adaptation and engine speed measurement via battery terminals or the cigarette lighter
- Easy adaptation leads to time savings in the case of enclosed engines
- No lowering of the driver's cab in commercial vehicles

Technical data

| | |
|---------------------|------------------------------|
| 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 |

Equipment supplied

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

Special accessories

Various connection cables available on request

Order number

BDM 298

1 687 023 298

Our **knowledge**, your **success**

Bosch Diagnostics

Diagnostics – the key to the automotive workshop of the future

Motor vehicle systems are becoming increasingly complex; the demands placed on qualified diagnosis in workshops are rising. For professional service on modern vehicles, Bosch provides everything at one stop, perfectly coordinated: test technology, software, technical training and hotline, supplemented by parts in initial equipment quality.



ESI[tronic]: Software for diagnostics and service

- Simple operation
- Rapid access
- Modular structure
- Comprehensive market coverage
- Continually updated
- Universal operation regardless of manufacturer



Test technology – matched to each workshop type

- Optimized combination of hardware and software for rapid troubleshooting, qualified repair and high time savings
- PC-based test technology of the latest generation with extendable modules



Service training: knowledge as a factor of success

- Comprehensive training programs for automotive workshops
- Practical training courses
- Highly qualified trainers with a great deal of practical experience



Technical hotline: Support from the system developer

- Support in difficult technical situations
- Skills covering all brands and manufacturers

Bosch – **skilled partner** for workshop business

Developments from Bosch stand for innovative progress in automobile manufacturing

Geared to the growing proportion of electronics in the vehicle, Bosch offers workshops the suitable test technology for all sizes of company and service concepts. Sturdy, innovative, state-of-the-art automobile technology: computer-assisted diagnosis systems help in finding any fault more quickly and more reliably. The modular layout – using future-oriented technologies – enables broad networking and efficient use of comprehensive information from the ESI[tronic] software. Mobility and user-friendly user guidance support the workshop in reliable and time-saving diagnostics.



ECU Diagnostics KTS



Engine System Testing FSA



Emission Analysis BEA



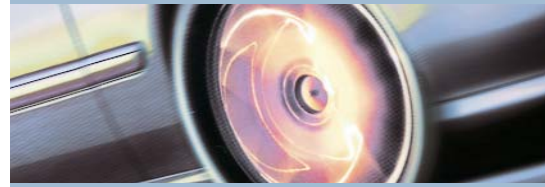
Diesel System Testing EPS



Battery Service BAT



Air Conditioning Service ACS



Brake Testing BSA



Wheel Alignment FWA

AA-DG/MKT2 - WAW 4450 GB 07.06 The right to make changes of a technical nature and to alter the range on offer is reserved

Where to find original Bosch Quality:

Robert Bosch GmbH
Automotive Aftermarket
D-76227 Karlsruhe

www.bosch-diagnostics.de



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