



Universal and future-orientated: Engine System Testing FSA

Powered by ESI[tronic]



BOSCH

Invented for life

Bosch Diagnostics

ESI[tronic]
Software

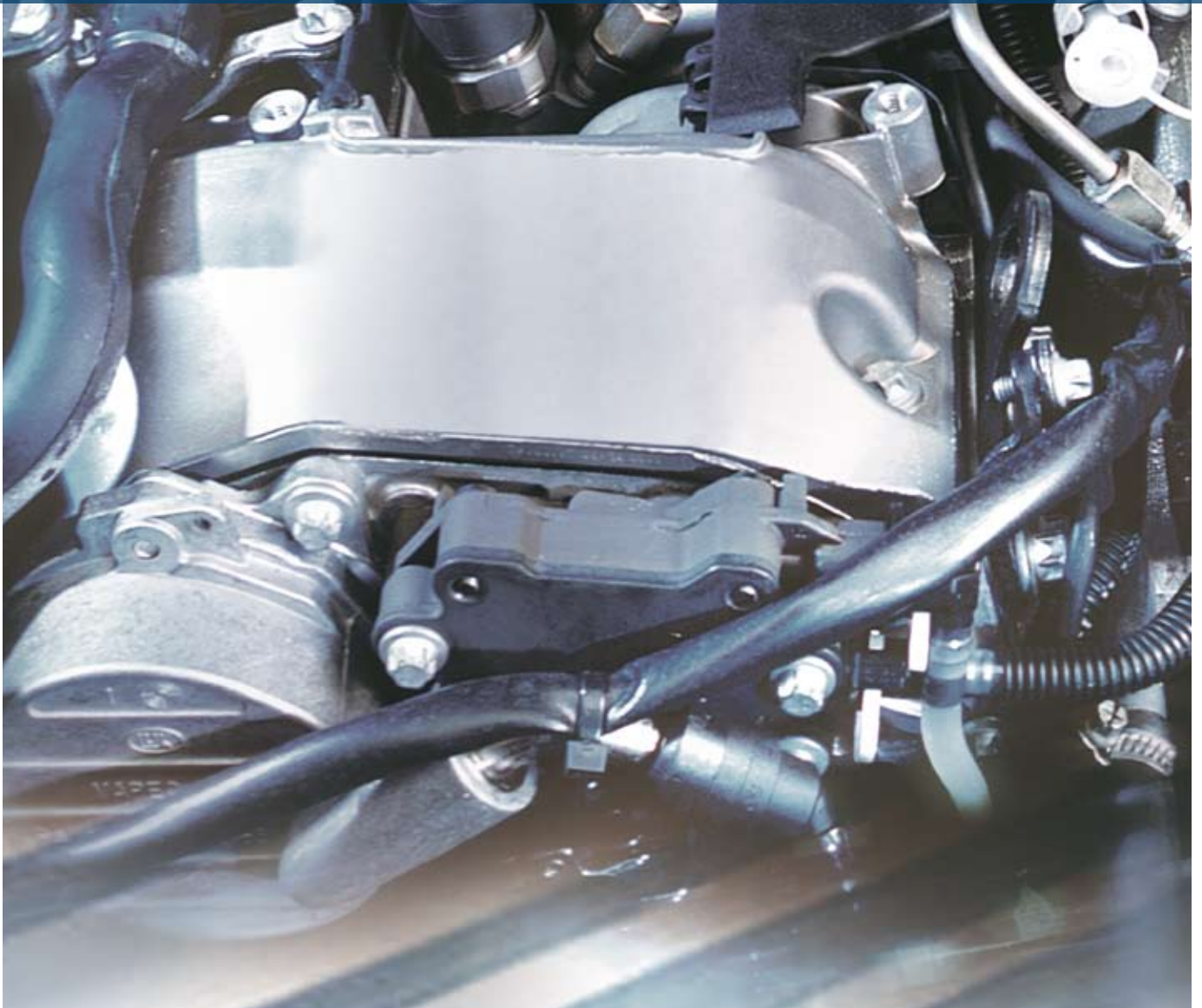
Test
Equipment

Service
Training

Technical
Hotline

Modern **vehicle system analysis** from Bosch

- ▶ FSA 750 – Vehicle system analysis (modular)
- ▶ KTS 670 – ECU diagnostics testers (mobile)
- ▶ FSA 740 – Vehicle system analysis (modular)
- ▶ FSA 720 – Vehicle system analysis (modular)
- ▶ FSA 450 – Vehicle system analysis (mobile)
- ▶ MMD 302 – Digital Multimeter
- ▶ ETZ 005.01 – Stroboscopic Lamp
- ▶ ETT 003.09 – Pocket Sensor
- ▶ ETT 018.10 – Lambda Control Tester
- ▶ ETT 011.00 – Volt-Ampère Tester
- ▶ EFAW 210 A – Pressure-Loss Tester



Vehicle system analysis: With **FSA 720/740/750** equipped for the future



FSA 750: State-of-the-art system analysis on the vehicle

Present-day complex vehicle systems and components are increasingly precision parts and it is essential that they operate faultlessly to fulfill their respective functions reliably and correctly. Fault analysis, diagnostics and the subsequent professional repair or maintenance work is becoming increasingly important. The keyword is „complexity“.

Ideally equipped for future requirements with Bosch

Efficient work sequences with system analysis and diagnosis will determine future everyday operations in the workshop. Bosch supports workshops with state-of-the-art analysis and diagnostics technology. Whoever wants to hold their ground and maintain a high profile can no longer do without professional, workshop-oriented hardware and software. This begins with stationary and mobile ECU diagnostics testers. Together with the extensive workshop software ESI[tronic], control units are detected automatically and target and actual values are compared with one another. Using Bosch testing technology and diagnostics software, sources of faults can be analyzed and repairs can be carried out in a timesaving and cost-efficient manner.

The complete system for efficient diagnosis

Bosch goes one step further with the component checks in the vehicle system analysis. Even more reliability in fault diagnosis, even more time saved because components that may be faulty can be checked while still installed. The optimized combination of troubleshooting, diagnosis and measurement technology makes Bosch workshops even more efficient.

The advantage for the workshop is that existing systems in the modular design can continue to be used. The modular system also allows additions to the vehicle system analysis to be perfectly tuned to one another. The workshop can also be equipped in steps with a comprehensive workshop testing system.

Satisfied customers and good business

Reliable analysis and diagnostics is the basis for fast and economical solutions to repair problems. It gives workshops a clear edge over competitors and demonstrates competence on a long-term basis. In cooperation with the workshops, Bosch offers new opportunities through constant and innovative support, opening up new customer groups for the workshop. With the vehicle system analysis in combination with the multimedia-capable, mobile diagnostics testers, the workshop takes a decisive step into the future.

FSA 750: The **professional diagnostics system** of the future

NEW! Improved performance through expanded main memory

NEW! Internal OBD exchange adapter

NEW! Simplified adapter concept
"Easy Connect"



Combined top technology from FSA 740 and KTS 670

The combination of the vehicle system analysis FSA 740 and the mobile ECU diagnostics tester KTS 670 is the perfect high-end solution at Bosch:

- ▶ Synergy effect through additional use of the integrated diagnostics tester KTS 670 as operating, display and computing unit for the vehicle system analysis
- ▶ Complete system for flexible use in the workshop

FSA 750: More reliable troubleshooting

To locate the defective part exactly, the vehicle system analysis is required in conjunction with the ECU diagnostics:

- ▶ Timesaving testing of components when installed (removal/installation of parts from/in vehicle is unnecessary)
- ▶ Menu-guided test steps for effective diagnostics
- ▶ Signal generator for simulating sensor signals
- ▶ Optimized tuning between SIS troubleshooting instructions, ECU Diagnostics and measuring technology
- ▶ Simple vehicle selection using ESI[tronic]
- ▶ High market coverage of all popular vehicles

KTS 670 – higher mobility in the workshop and on the vehicle

Together with ESI[tronic], the KTS 670 is the professional diagnostic system for vehicles in your workshop and during road tests. It includes:

- ▶ 2-channel multimeter for rapid tracing of faults through simultaneous testing of two components

KTS 670: Future-proof as it can be extended to a **comprehensive diagnostics system**



KTS 670: Top device from Bosch for ECU diagnostics

- ▶ 2-channel oscilloscope for complex measurements on state-of-the-art vehicle-system components – ideally suited for sensor testing in the vehicle, e.g. simultaneous display of both lambda sensors in a single display
- ▶ Screen with ideal resolution for a brilliant display, even where light conditions are poor (high brightness and large angle of view, and a touchscreen)
- ▶ Switch on and off and call up a virtual keyboard via a touch-sensitive key

Maximum functionality for practical diagnostics

- ▶ The KTS 670 masters all current diagnostics protocols:
 - ISO systems of European vehicles
 - SAE systems for American and Japanese vehicles
 - OBD-CAN protocols for testing state-of-the-art CAN bus systems in new vehicles
 - High speed to middle speed to low speed and single-wire CAN
- ▶ Software-controlled, integrated OBD-exchange adapter (box 01) means that even CAN protocols outside the OBD standard can be diagnosed
- ▶ The system automatically detects the control unit, reads out actual values, fault memory and control unit specific data

KTS 670: The diagnostics professional – powered by ESI[tronic]™

It is only with professional diagnostics and information systems that a workshop will be able in future to offer all services for innovative vehicles.

The KTS 670 from Bosch together with the ESI[tronic] software presents the perfect combination of hardware and software for efficient error analysis and qualified repairs.



The KTS 670 in the trolley can be upgraded to FSA 750

FSA 740: Universal vehicle system analysis with **innovative sensor test**



- ▶ Signal generator for testing sensors when installed!
- ▶ Component check

FSA 740: The universal diagnostics system for effective work in the workshop

- ▶ Only with the FSA from Bosch: The signal generator makes it possible to test sensors including leads and connections when installed.
- ▶ For exact localization of a fault: Measurement technology and the display are set to the respective component, which is then tested without time-consuming and expensive part removal.
- ▶ The engine test: The FSA measurement module, with its extensive range of sensors, can manage all of the functions of classical engine analyzers for measuring engine-related signals, such as primary and secondary ignition signals, triggering signals for firing module, speed, cylinder 1-synchronization and setting the moment of ignition.
- ▶ The ECU Diagnostics: The ECU diagnostics tester KTS 540 wireless included in the supplied equipment makes it possible to read out the fault memory in the vehicle electronic system.
- ▶ The modular system design: Adaptation to existing diagnostic systems and step-by-step expansion to a comprehensive workshop testing system.

PC system of individual components optimally tuned to one another

Apart from the FSA measurement module and the sensor equipment, the FSA 740 also includes a high-performance PC system with a non-dazzling, easily readable TFT monitor, remote control and printer.

FSA 740: Complete system with measurement module, control unit diagnostics, PC system and trolley

NEW! More for the same price: PC with increased power and 19" monitor



ECU Diagnostics

Troubleshooting instructions with the comprehensive workshop software ESI[tronic]1)



Signal generator

For simulation of sensor signals

Component Testing

Test of electric and electronic components when installed

Engine test

For measurement of engine-related signals

1) ESI[tronic] subscription required



Emission system analysis with BEA 050 and RTM 430

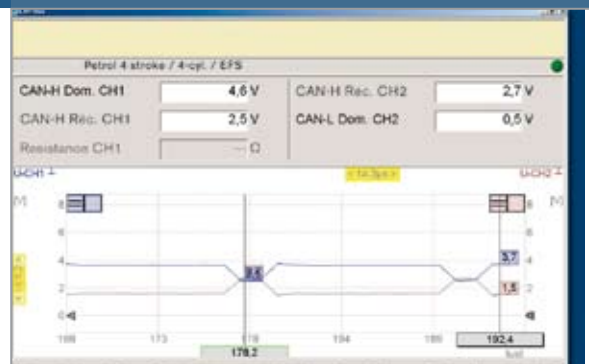
For extensive emission analysis of gasoline and diesel engines, the FSA 740 can be upgraded with the BEA 050 and RTM 430 without any problems.

The comprehensive software package for the FSA 720/740

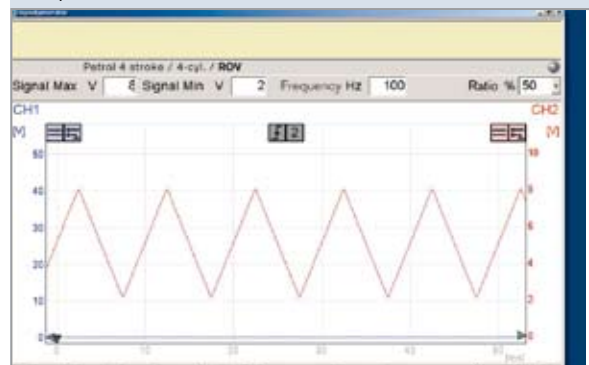
The workshop is supported in the Bosch vehicle system analysis by an extensive software package. The basic program „SystemSoft[plus]“ is included in the equipment supplied and contains general test and connection information, test steps as well as the software for the signal generator, multimeter and universal oscilloscope. The CompacSoft[plus] software contains the component test, vehicle-specific connection and test information as well as specified data for the test steps. The FSA specified data now covers around 95 % of all vehicles on the European market. For the use and extension of the vehicle-specific data, connection and test information, including the extension of the component testing after 2006, a CompacSoft[plus] subscription is necessary. The FSA measurement technology is supported perfectly by the workshop software ESI[tronic] from Bosch. Here, the mechanic will find all the important information concerning vehicles and the test procedure.

Examples of innovation and user-friendliness

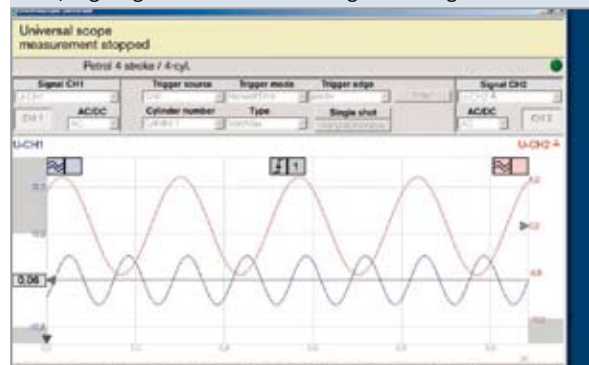
- 1) Practical function test of the CAN bus:** Workshops can now carry out a physical function test of the fast CAN bus systems in the vehicle – practically impossible up to now due to the high transmission speeds.
- 2) Versatile signal generator:** For testing sensors including leads and connections when installed. In this way, it is possible to tell whether an ECU, a feed, a plug-in connection or a sensor is defective. This allows efficient fault elimination without replacing parts „on suspicion“.
- 3) Powerful universal oscilloscope:** The scanning rates of the new universal oscilloscope of the FSA 720/740 reach up to 50 MHz. This provides sufficient reserves for the testing of future vehicle components.



1) Performance test of CAN bus



2) Signal generator for simulating sensor signals



3) Universal oscilloscope with high precision

FSA 720: A new **module** for the diagnostics system



- ▶ Signal generator for testing sensors when installed!
- ▶ Component check

FSA 720: A safe investment and economy through modular layout

The highly modern, fast measurement technology in the new FSA generation from Bosch forms the diagnostics platform of the future. The modular system layout of the FSA 720 secures existing investment in the workshop. Existing diagnostic systems can continue to be used. If the workshop already has a device from the KTS series – whether it is a 550/520 or one of the new 570/540/530 – and a PC, the system can be upgraded with the FSA 720 to a comprehensive workshop testing system.

The FSA 720 includes:

- ▶ Measurement module with sensor depot
- ▶ Installation angle and sensors for adaptation to vehicle

A PC or a laptop is required to operate the FSA 720.

From the classical engine test ...

FSA 720/740/750 can deal with the classical engine test for measuring engine-related signals, e.g. ignition signal, ignition angle or oil temperature.

... to component testing with innovative software

The decisive element of progress in the new tester generation for the workshop are the new testing options for electrical and electronic components. In this area, FSA 720/740 and 750 offer a large number of new and efficient applications with comprehensive software support.

Long-term measurement:

The 24-hour measurement of the battery peak coil current on vehicles with extensive electronic equipment provides information on „secret consumers“ and, in this way, finds the causes of frequent starting problems.

Extensive sensor equipment

Apart from the actual measurement module, the Bosch system tester FSA 720 also includes an extensive range of sensors. Ten sensor slots, and a free slot provided for sensor technology still unknown, allow effective work without continuous sensor changing.

Practical examples of application



Performance test of wheel sensor

KTS 540 diagnoses via ECU diagnostics „Speed sensor rear left no signal“

Possible causes of fault

- ▶ Speed sensor defective
- ▶ Plug-in connection or feed from ECU to speed sensor faulty

Localization of the fault via the vehicle system test

- ▶ Simulation of the sensor signal with the signal generator
- ▶ If the KTS 540 no longer diagnoses the fault, the speed sensor is faulty; otherwise a plug-in connection or feed is faulty



Component test of CAN bus

Via ECU diagnostics at the central control unit, the KTS 540 diagnoses a faulty communication with one of the satellite electronic control units

Possible causes of fault

- ▶ Defective satellite electronic control unit
- ▶ Fault in the CAN bus connection between the central control unit and the satellite control unit
- ▶ Signal interference

Localization of the fault via the vehicle system test

- ▶ Performance test of the CAN bus connection indicates that the CAN bus is in working order
- ▶ Cause of fault: defective satellite electronic control unit



Component testing, boost-pressure control

The KTS 540 diagnoses via ECU diagnostics „Boost-pressure control outside range“.

Possible causes of fault

- ▶ Exhaust-gas turbocharger is not working
- ▶ Fault in the piping
- ▶ Air-mass sensor defective

Localization of the fault via the vehicle system test

- ▶ Measurement of charge-air pressure in intake manifold
- ▶ Pressure at idle: 0 bar; push of accelerator: 0.8 bar; cause of fault: defective air-mass sensor
- ▶ Pressure at push of accelerator: 0 bar; cause of fault: Turbo or piping defective



Component test Battery peak-coil current measurement

Vehicle has starting problems after a long time parked, KTS 540 does not diagnose a fault with the ECU diagnostics

Localization of the fault via the vehicle system test

- ▶ The battery peak coil current is measured
- ▶ Diagnostics: battery peak coil current is clearly above the value specified by the vehicle manufacturer
- ▶ Failure cause: the supply voltage was incorrectly wired at the vehicle radio – continuous supply and switched supply were interchanged

FSA 750 and KTS 670: **Facts** and **figures**

Scope of delivery FSA 750

Trolley
Charging tray
Measurement module with sensor carrier
Power unit with mains connection cable
Printer
Remote control (transmitter and receiver)
System tester KTS 670
System software SystemSoft[plus]*

Sensors

Connecting cable for Multi 1
Connecting cable for Multi 2
Connecting cable for B+/B-
Connecting cable for term. 1/15 (Uni-line IV)
Measurement transmitter 3 x KV+/Rt
Measurement transmitter 3 x KV-/Sw
Trigger clamp
Clamp-on probe 1000 A
Clamp-on probe 30 A
Stroboscope
Oil temperature sensor
Air pressure measurement with hose line

Accessories	Order number
-------------	--------------

Air-temperature sensor	1 687 230 060
Connecting line for Air-temperature sensor	1 684 465 517
Supplementary-equipment set BEA 050	1 687 001 865
Supplementary-equipment set RTM 430 (function only in conjunction with BEA 050)	1 687 001 577
Package: Primary ignition Connecting cables: BMW, Opel	0 688 100 017
Package: Secondary ignition Connecting cables: Audi, BMW, MB Test adapter: A, B, C/D, E, F/X, Y	0 688 100 002
FSA 750 (with Ger. keyboard)	0 684 010 753**
FSA 750 (without keyboard)	0 684 010 754

Technical Data

Dimensions (H x W x D)	approx. 1785 x 680 x 670 mm
Weight	approx. 93 kg
Voltage for power supply unit	90 – 264 VAC / 47 – 63 Hz
Operating temperature range	5 °C to 40 °C

* The SystemSoft [plus] contains the software for signal generator, multimeter and oscilloscope, including general test steps and general test and connection information.

** For German-speaking countries

Technical Data KTS 670

PC board	Operating system Windows XP, 1 GB main memory, 40 GB hard drive capacity
Display	12.1" TFT color display with touch-screen, industrial standard, resulting in outstanding brilliance and wide angle view; resolution SVGA 800 x 600 dpi
Equipment	Multimedia, built-in speaker and headset connection, installed LAN network card (10/100 Mbit), PCM CIA standard connection enables WLAN connection
Status indicator	Via 4 LEDs: On/Off, mains operation, battery charge status, hard-drive access
Operation	Touch screen, 2 touch-sensitive keys; On/Off button, special menu key (backlighting control, virtual keyboard...)
Lithium ionic battery	Service life depending upon charge status and application approx. 1 to 2 hours
Housing	Stable plastic housing, integrated impact protection
Operating temperature	0 to 40 °C
Weight	approx. 4 kg
Diagnostics protocols	ISO 9141-2, K/Llines, flashing code SAE-J1850 VPW (GM, ...) } corresponds to SAE-J1850 PWM (Ford) } ISO 11519-4 CAN ISO 11898 ISO 15765-4 (OBD) High-speed, middle-speed, low-speed and single-wire CAN
2-channel multimeter	Accuracy 1% of measured value Voltage, minimum resolution: 0.1 mV, maximum measuring range: 200 V. Current, minimum resolution: 0.1 mA, maximum measurement range: 1000 A (special accessories). Resistor, minimum resolution: 100 mOhm, max. measurement range: 1 MOhm
2-channel oscilloscope	With 1-channel operation: 10 mega-samples / sec With 2-channel operation: 2 x 5 mega-samples /sec
Connections for	OBD diagnosis cable, adapter concept "Easy Connect", Uni 4-adapter and existing adapter concept Multimeter: channel 1: socket yellow (+), blue (-), channel 2: red (+) and black (ground), 2 x USB 2.0, LAN connection, port jacks for contacts for stationary charger, PS/2 for pointing device or keyboard, VGA for external monitor, PCMCIA 2 x type 2 or 1 x type 3, micro-in, line-out, headset

FSA 740/720: **Facts** and **figures**

Scope of delivery FSA 740	
Trolley	
Measurement module with sensor carrier	
Power unit with mains connection cable	
PC with operating system Windows XP	
Monitor, mouse, printer	
Remote control (transmitter and receiver)	
System tester KTS 540 wireless	
System software SystemSoft[plus]*	
Sensors	
Connecting cable for Multi 1	
Connecting cable for Multi 2	
Connecting cable for B+/B-	
Connecting cable for term. 1/15 (Uni-line IV)	
Measurement transmitter 3 x KV+/Rt	
Measurement transmitter 3 x KV-/Sw	
Trigger clamp	
Clamp-on probe 1000 A	
Stroboscope	
Oil temperature sensor	
Air pressure measurement with hose line	
Accessories	Order number
Clamp-on probe 30 A	1 687 224 969
Air-temperature sensor	1 687 230 060
Connecting line for air-temperature sensor	1 684 465 517
Supplementary-equipment set BEA 050	1 687 001 865
Supplementary-equipment set RTM 430 (function only in conjunction with BEA 050)	1 687 001 577
Package: Primary ignition Connecting cables: BMW, Opel	0 688 100 017
Package: Secondary ignition Connecting cables: Audi, BMW, MB Test adapter: A, B, C/D, E, F/X, Y	0 688 100 002
FSA 740 (Ger. keyboard, KTS 540, incl. clamp-on probe 30 A)	0 684 010 720**
FSA 740 (without keyboard))	0 684 010 723
FSA 740 (without KTS 540, with Ger. keyboard, incl. clamp-on probe 30 A)	0 684 010 718**
FSA 740 (without KTS 540, without keyboard)	0 684 010 722
FSA 740 (with BEA 050, without keyboard)	0 684 010 724
FSA 740 (with BEA 050 and RTM, without keyboard)	0 684 010 725
Technical Data	
Dimensions (H x W x D)	approx. 1785 x 680 x 670 mm
Weight	approx. 91 kg
Voltage for power supply unit	90 – 264 VAC / 47 – 63 Hz
Operating temperature range	5 °C to 40 °C

* The SystemSoft [plus] contains the software for signal generator, multimeter and oscilloscope, including general test steps and general test and connection information.

** For German-speaking countries

Scope of delivery FSA 720	
Measurement module with sensor carrier	
Installation angle	
Power unit with mains connection cable	
System software SystemSoft[plus]*	
Sensors	
Connecting cable for Multi 1	
Connecting cable for Multi 2	
Connecting cable for B+/B-	
Connecting cable for term. 1/15 (Uni-line IV)	
Measurement transmitter 3 x KV+/Rt	
Measurement transmitter 3 x KV-/Sw	
Trigger clamp	
Clamp-on probe 1000 A	
Stroboscope	
Oil temperature sensor	
Air pressure measurement with hose line	
Accessories	Order number
Clamp-on probe 30 A	1 687 224 969
Air-temperature sensor	1 687 230 060
Connecting line for air-temperature sensor	1 684 465 517
Package: Primary ignition Connecting cables: BMW, Opel	0 688 100 017
Package: Secondary ignition Connecting cables: Audi, BMW, MB Test adapter: A, B, C/D, E, F/X, Y	0 688 100 002
Technical Data	
Dimensions (H x W x D) (with installation angle, without sensors)	approx. 210 x 550 x 200 mm
Weight	approx. 8 kg
Voltage for power supply unit	90 – 264 VAC / 47 – 63 Hz
Operating temperature range	5 °C to 40 °C
Order number FSA 720	0 684 010 500
Minimum requirements for external PCs (desktop and notebook):	
Hardware	
CPU Intel/AMD 1.800 MHz or higher	
RAM min. 512 MB	
at least 5 GB free hard disk space	
DVD drive for ESI[tronic]	
1 free USB connection for FSA 720 (we recommend a direct connection without an interposed USB hub)	
1 PS/2 PS/2 keyboard connection for linking the remote control receiver (option)	
In this case, observe the specifications of the PC/notebook manufacturer in the manual. In some circumstances, an additional special adapter cable is necessary.	
Vehicles can produce special electromagnetic radiation. Bosch PCs have been tested in this environment. To guarantee perfect operation, we recommend that the FSA 720 is run with a Bosch PC.	
Software	
Operating system: Windows XP SP2 und Vista™ Home Premium	

FSA 450: The **compact solution** for measurements at the vehicle

The System Tester FSA 450 is a practical combination of:

- ▶ Multimeter with digital and graphical display
- ▶ 4-channel oscilloscope
- ▶ Ignition analyzer
- ▶ Engine analyzer



The all-in-one solution for comprehensive tests

For fast testing of vehicle electrical systems and electronics, a 4-channel oscilloscope, a digital multimeter with digital and graphical display and an engine and ignition analyzer have been integrated in the FSA 450. The measured results are displayed on an 8" color display; all measured values and oscillograms can be saved and called up again.

Mobile and universal

Apart from the integrated battery, the hand-held tester, with a weight of only 1.4 kg, can also be powered from the 12V vehicle electrical system or via the plug-in power supply unit included in the delivery. The compact device is operated from the robust touchscreen with 11 operating keys. The modern design of the FSA 450 can also be used for test drives, which has a high practical value in many cases.

Extended options through special accessories

The special accessories of the FSA 450 offer a complete sensor system range, e.g. vacuum and pressure sensors, clamp-on probes and infrared sensors.

Future-proof and extendable up to the last detail

The FSA 450 from Bosch demonstrates its strengths particularly in mobile applications. The tester is also ideally suited to use in the workshop, for example, for an uncomplicated final check of a repair.

The menu-guided displays are user-friendly and self-explanatory; the function keys for operating the most commonly used functions have been assigned unambiguously.

Numerous fitting details make the FSA 450 a future-proof and practice-oriented diagnostics solution for every workshop:

- ▶ User friendly touchscreen technology
- ▶ Ergonomic design
- ▶ Light weight (1,4 kg)
- ▶ High-resolution display (640 x 480 Pixel)
- ▶ Shockproof housing
- ▶ Dirt-repelling touchscreen
- ▶ Color-coded connection sockets

Convenient oscilloscope for displaying complex signals

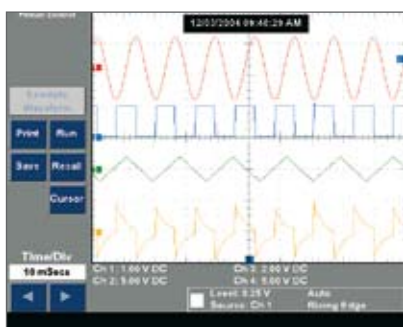


FSA 450: Small and handy for fast deployment at the vehicle

Comprehensive usage

The FSA 450 can of course also be connected to a PC – for training courses for example. The TechView software required to do this is included in the special accessories. In this case, operation is either by means of a LAN connection via the PC, or locally at the tester.

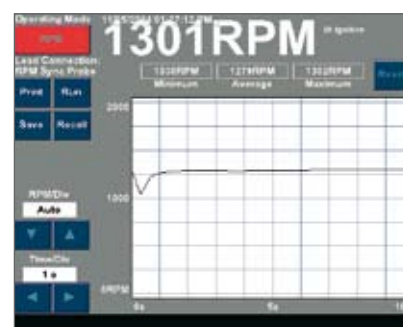
The integrated high-performance processor allows processing and graphic display of the signal curves in real time. All data is available immediately on the clearly arranged display and can be saved and called up at a later time.



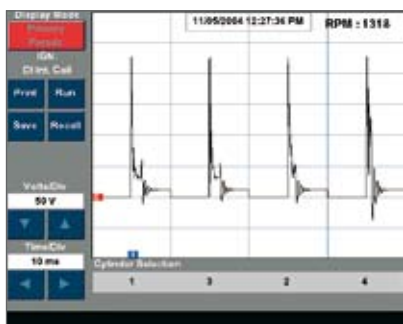
4-channel Universal Scope, which also permits display of complex signal curves.



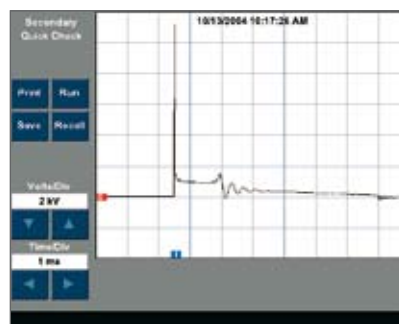
Digital multimeter with graphical and digital display supports rapid evaluation.



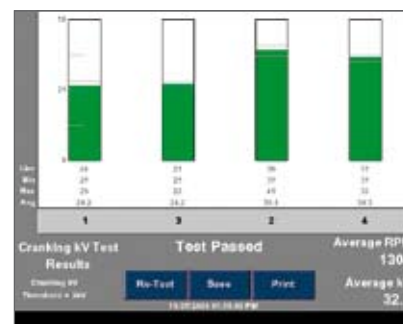
Graphical and digital display of the speed



Primary and secondary ignition oscilloscope for quick analysis of ignition system, primary ignition parade



Secondary ignition quick test

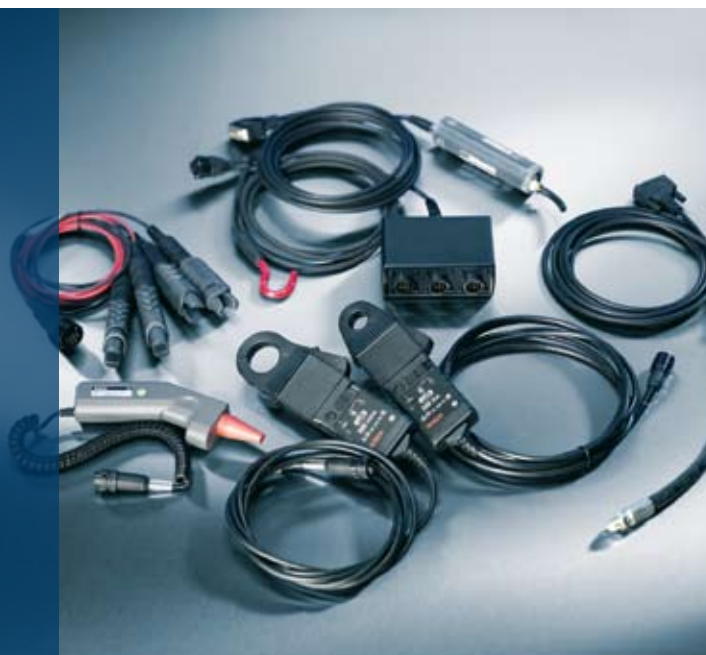


Bar chart with ignition voltage

Technical **Data** and **special accessories**



FSA 450: In a case for professional use



FSA 450: Extensive special accessories for specific tasks

Technical Data	
Configuration	Hand-held
Dimensions	approx. (H x W x D) 261 x 248 x 44,5 mm
Weight	approx. 1,4 kg
Display	TFT Color Display VGA (640 x 480); 8.0" screen diagonal
Operation	Touchscreen and 11 keys
Interner memory	Flash EEPROM: 16 MB DRAM: 32 MB
Measuring input	4 oscilloscope inputs Ignition, secondary Ignition, primary Input for vacuum sensor/pressure sensor Input for digital voltmeter Input for trigger clamp
Interfaces	LAN and two RS232
Power sources	Internal nickel-metal hybrid batteries 12 V from vehicle battery External AC/DC transformer
Order number	0 684 010 450

Scope of delivery
Measuring lines for oscilloscope and multimeter
Connecting cable for term. 1/15
Secondary ignition pickup
Clip-on trigger sensor
Power unit (100-240 V/50-60 Hz)
Adapter for power supply via vehicle battery terminals
Adaptor for supply via cigarette lighter
Case

Special accessories	Order number
Clamp-on probe 1000 A	1 687 224 968
Clamp-on probe 30 A	1 687 224 969
Secondary ignition transmitter up to 4-cylinders (only in connection with 1 684 465 534)	1 687 224 990
Adapter box for secondary ignition (1 687 224 990 also required)	1 684 465 534
Infrared temperature sensor	1 687 230 066
Vacuum sensor	1 687 231 258
Pressure sensor	1 687 231 260
Adapter for clamp-on probe	1 684 463 522

Digital Multimeter MMD 302

Stroboscopic Lamp ETZ 005.01



Digital-Multimeter MMD 302



Stroboscopic Lamp ETZ 005.01

Digital-Multimeter MMD 302

Scope of delivery

Basic device, test cable with test points, connection clips, rubber protective cap with stand, two dry cells (fitted)

Technical Data	MMD 302
Direct and alternating voltage measurement	✓
Direct and alternating current measurement	✓
Resistance measurement	✓
Acoustic continuity test	✓
Diode check	✓
Capacitor check	✓
Frequency measurement	✓
Automatic measurement range changeover	✓
MIN/MAX operating mode, recording and saving minimum and maximum measured values	✓
RELD operating mode, display of difference between current and stored measured values	✓
HOLD function to "freeze" the display	✓
Separately fused 10 A measurement input	✓
Dimensions MMD 302 (H x B x T) in mm	200 x 98 x 52
Weight	250 g
Order number	0 684 500 302

Stroboscopic lamp ETZ 005.01: The handy stroboscopic lamp with xenon flashing lamp measures and tests precisely:

- ▶ Basic setting of the ignition distributor
- ▶ Advance angle
- ▶ Centrifugal advance
- ▶ Vacuum advance mechanism

Technical Data	
Power supply	Vehicle electrical system 6 V and 12 V
Weight	0.75 kg
Cable length	1.5 m
Order number	0 684 100 501

Pocket Sensor ETZ 003.09



For setting the moment of ignition for more power and longer service life

Correct ignition timing has a crucial influence on the engine fuel consumption, power and engine service life.

Technical Data	
Xenon light	a visible light flash even in bright room
Housing	sturdy plastic, insensitive to engine oil and fuel
Cable	1.5 m
Weight	0.5 kg
Clip-on sensor	can be clamped over the ignition cable in any desired form; independent of direction
Order number	0 684 100 309

Lambda control tester ETT 018.10

Volt-Ampere tester ETT 011.00



ETT 018.10

Lambda control tester ETT 018.10: for setting and testing the lambda closed-loop control on Jetronic/ Motronic systems

Measurement of the pulse duty factor on K-, KE-Jetronic, LFR systems and Ecotronic, the integrator voltage on L-, -LU-, -LH- and L3-Jetronic, of the Lambda sensor signal and of the KE-Jetronic actuator current, lambda closed-loop control simulation, cordless.

Scope of delivery

Lambda control tester, connecting cable, adapter cable (6.3 mm blade terminal)

Accessories

Various adapter cables for sensor plug connections

Technical Data		
Dimensions (W x H x D)	147 x 160 x 200 mm	
Weight	1.8 kg	
Order number	0 684 101 810	
Measuring ranges		
Resolution		
Power supply via vehicle battery		
Voltage measurement	0 ... 12 V 0 ... 1.2 V	0.1 V 0.01 V
Pulse duty factor measurement	0 ... 50-% 0 ... 100-%	1 % 2 %
Current measurement	-20 ... 20 mA	1 mA



ETT 011.00

Volt-Ampère tester ETT 011.00: Starter and alternator tester

- ▶ Built-in load resistance
- ▶ Cordless
- ▶ Automatic switchover of measuring range of power supply

Scope of delivery

Volt-Ampère tester, 4 connection cables, wire basket for cables

Technical Data	
Dimensions of tester (W x H x D)	294 x 160 x 200 mm
Dimensions of wire basket (W x H x D)	100 x 160 x 195 mm
Weight	6.5 kg
Power supply	6, 12, 24 V
3 voltage measurement ranges	0 ... 3.2 V, ... 16 V, ... 32 V
3 current measurement ranges	- 5 ... 0 ... + 50 A - 10 ... 0 ... + 100 A - 100 ... 0 ... + 1000 A
Order number	0 684 101 100

Pressure-Loss Tester EFAW 210 A

For localisation of pressure loss in internal-combustion engines



Scope of delivery

Pressure-loss tester EFAW 210 A, high-pressure test hose, crankshaft-TDC detector, test nozzle for adjusting the tester

Accessories

Various adapters for plug connections

Technical Data	
Housing	impact-resistant rubber jacket
Dimensions (W x H x D)	300 x 130 x 130 mm
Measuring range	0 – 100 % pressure loss
Application	for all reciprocating piston and rotary piston engines
Scale	270°
Required air pressure	min. 4 bar (water separator in compressed-air system)
Order number	0 681 001 901

Universal adaptations



Universal adapter 1 684 463 344, 5-pin

Universal adaptations 2/3/4/5-pin

Blade terminal, Y-shaped with banana jacks

Order number

2-pin	1 684 463 093
Injection nozzles, Lambda sensors	
3-pin	1 684 463 342
Intake manifold pressure sensor, camshaft sensor, speed reference mark sensor	
4-pin	1 684 463 343
5-pin	1 684 463 344



Universal adapter 1 684 463 447, 3-pin

Universal adaptations 3/4/5/6-pin

Blade terminal, Y-shaped, oval connector housing with banana jacks

Order number

3-pin	1 684 463 447
Camshaft sensor, crankshaft sensor, pressure sensor	
4-pin	1 684 463 448
Lambda sensors, primary adapter cable with oval ignition coil connection in conjunction with Universal adapter cable (1 684 462 211)	
5-pin	1 684 463 478
Air-mass sensor as primary adapter in conjunction with primary adapter cable (1 684 462 374)	
6-pin	1 684 463 449
Throttle valve servomotor as primary adapter in conjunction with Universal adapter cable (1 684 462 374) for testing ignition rails	



Universal adapter 1 684 463 382, 5-pin

Universal adaptations 2/3/4/5-pin

Blade terminal, Y-shaped with banana jacks

Universal adaptations 2/3/4/5-pin

Blade terminal, Y-shaped, oval connector housing

2 pin	1 684 463 379	4-pin	1 684 463 381
3-pin	1 684 463 380	5-pin	1 684 463 382



Test point set

Test point set

1 684 485 362

3 flexible test points in red, black and gray.
4.8 mm banana jacks.

Universal adaptations

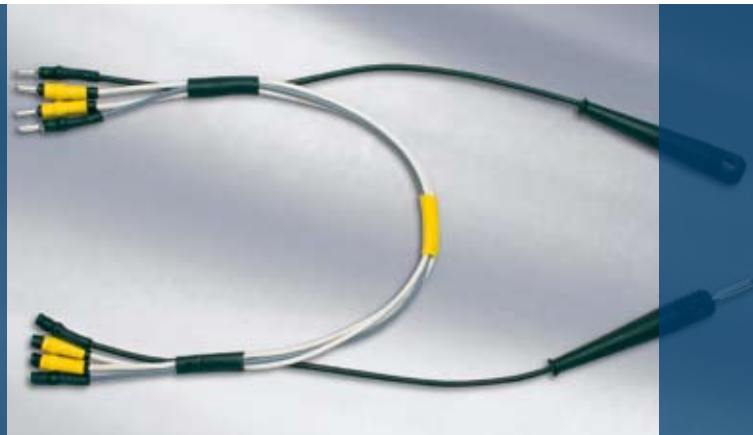


Universal adapter 1 684 463 479, 6-pin

Universal adapter cable 6-pin 1 684 463 479
Pin terminal, Y-shaped
E-gas, throttle valve control unit, pedal-travel sensor ME 2.0

Universal adaptations 2-pin 1 684 463 477
Blade terminal, Y-shaped with banana jacks,
canister-purge valve, knock sensor, boost-pressure
control

Adapter cable, 2-pin 1 684 463 492
Y-shaped, injection signal (e. g. for VW, Audi, Seat,
Skoda, Ford)



1 684 463 240: Lambda sensors 4 x 1-pin

Universal adaptations 3 x 1/4 x 1-pin
Pin terminal, Y-shaped

Order number (Lambda sensors)

3 x 1-pin:	2.1 mm	1 684 463 236
4 x 1-pin:	1.6 mm	1 684 463 237
	2.1 mm	1 684 463 238
	2.3 mm	1 684 463 239
	2.5 mm	1 684 463 240



Test cable set

Test cable set 1 687 011 314
11-piece set of adapter cables with blade and
pin terminals, test points, test and clip terminals.



Needle contact

Needle contact 1 684 480 118
Needle contact with test point protection. Moves back
when connecting to cables and allows a test point to
enter the cable.

This needle contact allows you to set up an electrical
connection to a cable if there is no other adaptation
option.

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 equipment, 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 equipment – matched to each workshop type

- ▶ Optimized combination of hardware and software for rapid troubleshooting, qualified repair and high time savings
- ▶ PC-based Test equipment 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
- ▶ Skill 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 equipment 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 timesaving diagnostics.



WAW 4080 GB 05.08 The right to make changes of a technical nature and to alter the range on offer is reserved

Where to find original Bosch Quality:

www.bosch-diagnostics.de
www.werkstattportal.bosch.de



ECU Diagnostics KTS



Engine System Testing FSA



Emission Analysis BEA



Diesel System Testing EPS



Battery Service BAT



Air Conditioning Service ACS



Wheel Alignment FWA



BOSCH

Invented for life