

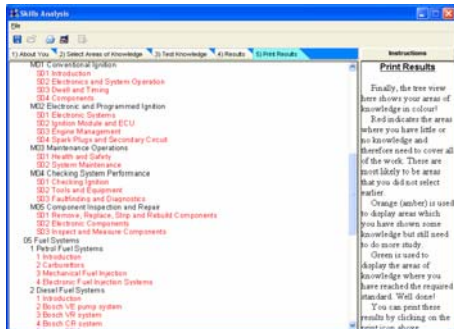
AUTOMOTIVE TECHNICIAN TRAINING

DIGITAL UNIVERSITY PRESS

In association with:



New—Skills Gap Assessor



Development screen from the Skills Assessor program

Automotive Technician Training is fast becoming the preferred method for use in UK colleges and training providers. DUP is working hard to make sure it continues to meet the needs of all our users.

One aspect that we received feedback about, is the need for initial assessment and progress monitoring of students. To be able to initially assess our students and then focus them in to an individualized curriculum is something that we would all wish to achieve. This is often difficult, taking into account existing resources—human and physical.

New—Features

The latest version of Automotive Technician Training (ATT) has been upgraded so that all the learning screens are high quality multimedia. However, a low resolution CD is still supplied that contains the full set of material. Some new resources have also been added to the database CDs. A change to the interface means that it is even easier to use. You need to try it to see, but the following is a summary of the main changes:

- [Workbooks can be printed as](#)

However, DUP is now in the final stages of integrating a skills assessment program into their automotive product.

By first 'ticking boxes' to show areas of 'perceived' existing knowledge—and then answering multiple-choice questions to check it—this program will show both the instructor and student where they need to concentrate their efforts. A profile is produced that shows areas of knowledge on screen or as a printout as:

Green—achieved over 80% in the test

Amber—on the way but more to do

Red—little or no existing knowledge

Clearly, most new students will fall into the latter category but those who do not can focus their study where it is needed.

There will be a small additional cost for this facility (see below) however, it is one more tool to reduce your workload and improve learning.

Special points of interest:

- **Skills Assessor**
- **Technology updates**
- **New features**
- **Program tips**
- **Updates**
- **Virtual learning environment option**
- **Coming soon—Key Skills material...**

Inside this issue:





Bosch—25 years of ABS	2
How ABS works	2
Additional ABS functions	3
ABS—Fitted as standard	3
Blended learning	4
Top tips...	4

required

- [Glossary links on every screen](#)
- [New multiple-choice questions added](#)
- [Skills gap analysis tool option](#)
- [New improved interface](#)
- [Even better multimedia](#)

Bosch—25 Years of ABS

25 years of ABS 1978 - 2003
smaller, lighter, more efficient

	ABS 2	ABS 2E	ABS 5.3	ABS 8.0
generation				
weight in kg	6,3	4,9	2,6	1,6
number of components of ECU	140	40	25	16
memory size in kByte	2	8	24	128
	1978	1989	1995	2003

“In 1978, Bosch was the first manufacturer worldwide to go into series production with the antilock braking system ABS for passenger cars—70% of modern cars now have this safety system”

A core component of driving safety for motor vehicles is celebrating its 25th anniversary: the ABS antilock braking system.

Before ABS was introduced, control of steering under emergency braking was not possible, and tyres suffered enormously. The antilock system first produced by Bosch in 1978 prevents the wheels from locking, leaving the vehicle under control and allowing the driver

to steer around obstacles. Braking distance is also reduced in most cases.

The increasing use of ABS in motor vehicles is a major contribution to safety on the roads. People had been wondering how to prevent wheels from locking since the beginning of the 20th century – not only on cars, but also on railway vehicles and even on airplanes. As early as 1936, Bosch had registered a patent for a “mechanism to prevent locking of the wheels of a motor vehicle”.

It was not until digital technology became available in the '70s that a reliable ABS system could be developed. Bosch started working on the project in 1964 and within two years had already managed to reduce the braking distance on test vehicles. Steerability and cornering stability were also retained. Based on these early models, the engineers were able to design

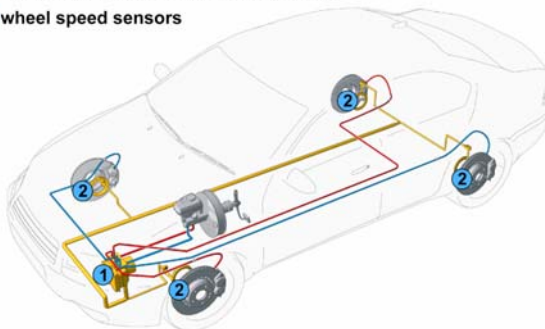
a system which, for the very first time, was controlled entirely by electronics. The basic structure of this new design – named ABS 1 – is still to be found in nearly all ABS systems. But the reliability and durability of the electronic control unit with its roughly 1000 analog components and the safety switches then used were not yet good enough for volume production.

The advent of digital technology and integrated control circuits finally allowed the number of electronic components to be reduced to 140 in total. After 14 long years of development, everything was finally in place in 1978: the second generation of Bosch's ABS – ABS 2 – began to be fitted as optional equipment.

How it works

Antilock Braking System ABS

- 1 hydraulic modulator with attached ECU
- 2 wheel speed sensors



Then as now, the hydraulic unit remains the central component of an ABS system. Each of the four wheels has a speed sensor, which measures the rotational speed of the wheel.

This information is monitored by an electronic control unit, which opens and closes the magnetic valves at the right time. If a wheel is about to lock under heavy braking, the system continues to reduce the hydraulic pressure on that wheel alone until the threat of

locking is past. Once the wheel is turning freely again, the hydraulic pressure is increased.

This increase and release of pressure continues until the driver reduces the force on the brake pedal or until the tendency to lock is overcome – if there is more grip on the road surface, for instance. Depending on the particular system, there is a certain amount of feedback movement at the brake pedal.

Additional functions

During the succeeding years, developers concentrated on simplifying the system. In 1989 Bosch's engineers succeeded in attaching a hybrid control unit directly to the hydraulic modulator. This allowed them to dispense with both the wiring harness linking the control unit and the hydraulic modulator and the vulnerable plug-in connectors, and significantly reduce the overall weight of this ABS 2E generation.

Using new solenoid valves, Bosch engineers created generation 5.0 in 1993, and in subsequent years versions 5.3 and 5.7. The main features were once again a significantly reduced weight and additional functions such as electronically distributed brake pressure, which replaced the mechanical brake pressure reduction mechanism on the rear axle.

ABS 8 – the current generation – first appeared in 2001. It has a modular design, which allows the various degrees of complexity of the brake control system –

ABS, TCS and ESP – to be manufactured in very similar ways. This makes it possible to optimize synergies in development and manufacture.

All the systems currently produced by Bosch are manufactured to the same quality standards, regardless of where in the world they are actually produced. The majority of ABS systems are manufactured as close as possible to the customer being supplied – no matter whether that is in Germany, France, the USA, Korea or Japan.

With increasing technical progress, the range and number of functions also increases. In 1987, for example, Bosch began series production for passenger cars of the ABS-based TCS traction control system which prevents wheel spin.

TCS helps to improve acceleration on smooth or slippery surfaces, and also increases stability by reducing engine power when corners are taken too fast. The ESP Electronic Stability Program – the most ad-

vanced brake control system in the world – was launched by Bosch in 1995 as a world first.

It improves stability not only under braking and acceleration, but in every driving situation. If there is a risk of the vehicle going into a skid, ESP reduces engine power and simultaneously provides braking pressure to individual wheels – offering a significant increase in driving safety.



ABS under test on a Mercedes

“TCS helps to improve acceleration on smooth or slippery surfaces, and also increases stability by reducing engine power when corners are taken too fast.”

Fitted as standard

The successive technical improvements have meant that ABS has been providing greater safety in more and more vehicles since the start of production.

Through the '80s, annual sales of ABS grew slowly. In 1986, Bosch delivered its millionth ABS system to its customers. During the '90s, ABS finally began to be fitted to medium-sized and

compact cars. Sales figures grew from year to year: by 1999, Bosch alone had sold a cumulative total of 50 million systems.

Soon – at least in Europe – every new car will have ABS: according to a self-commitment of the European car manufacturers' association every car sold in Europe from mid-2004 onwards will be fitted as stan-

dard with the ABS safety system.



A modern hydraulic modulator and control electronics

Blended Learning Solutions

Digital University Press
Whitegates Business Centre
Alexander Lane
Shenfield
Essex CM15 8QF UK

Phone: +44 (0)1277 219119
Fax: +44 (0)1277 219120
Email: info@digitalup.co.uk



WE ARE ON THE WEB:
WWW.DIGITALUP.CO.UK

As the leading provider of automotive training blended learning systems in the UK and USA, Digital University Press (DUP) specialise in the creation of electronic training materials for the automotive education sector and automotive industry.

Working with world class automotive companies DUP has a substantial training resource that comprises over 7000 screens of learning coupled with a 1500 page workbook, 10,000 image database, 300 worksheets, and 1,500 randomly generated multiple-choice questions. Having control over this intellectual property allows DUP to be bespoke and re-brand but, most importantly, respond to clients in a timely and cost effective way.

DUP is owned principally by Mark Pitman of Pitman Publishing, Pitman Training and Bath Press. Alan Church is the managing director of DUP with the technical team being led by Tom Denton the UK best selling automotive author.

Top Tips...



Got any useful tips to share?
Email them to the address
above and get a mention in the
next newsletter!

Welcome to the regular Top Tips feature!

Each newsletter will include two or three suggestions to help you get the most out of our automotive training program.

Did you know...

1. ...to zoom in on any learning screen—all you do is right click the mouse and select 'zoom in'?
2. ...that to print out some of the multiple choice questions—on the screen where you choose the number of

questions, press and hold <ctrl> + <alt> and then press the keys D U P in order; an option to print button will appear?

3. ...that there are dozens of playlists on the database CDs? Open the resource database, select the 'playlist' tab, right click and then choose 'Load playlist.'

Automotive Technician Training

