

What is EOBD, EOBD2 and OBD-II

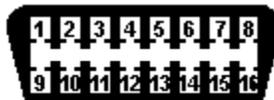
What is EOBD?

EOBD is an abbreviation of **E**uropean **O**n-**B**oard **D**iagnostics.

All petrol cars sold within Europe since 1 Jan 2001, and diesel cars manufactured from 2003, must have on-board diagnostic systems to monitor engine emissions.

These systems were introduced in line with **European Directive 98/69/EC** to monitor and reduce emissions from cars.

All such cars must also have a standard EOBD diagnostic socket that provides access to this system (as shown below).



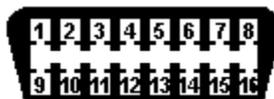
The EOBD / OBDII 16-pin diagnostic connector (DLC)

Where is the connector?

The EOBD connector is required by the Directive to be located within the passenger compartment of the car, within reach of the driver's seat. Tools should not be required to reveal the connector, but it may have a removable cover over it.

What does the connector look like?

The connector has the following shape:



Which pins contacts should be present on the connector?

Different pins on the connector are used by different manufacturers. There are 5 pin out combinations within the standard, each of which uses a specific communications protocol. These are listed below:

Protocol	Connector pins used
J1850 VPW	2, 4, 5, and 16, but not 10
ISO 9141-2	4, 5, 7, 15 (see below) and 16
J1850 PWM	2, 4, 5, 10 and 16
KWP2000 (ISO 14230)	4, 5, 7, 15 (see below) and 16
CAN (Controller Area Network)	4, 5, 6, 14 and 16

Note: For ISO/KWP2000 communications, **pin 15** (L-line) is not always required. Pin 15 was used on earlier ISO/KWP2000 cars to "wake-up" the ECU before communication could begin on pin 7 (K-Line). Later cars tend to communicate using only pin 7 (K-Line).

Rover and MG cars: We have noticed that many Rover and MG models do not have pin 5 (Signal Ground). This can prevent some diagnostic tools from 'powering up' where they use pin 5 as the ground for the circuitry.

What are each of the pins used for?

The pins are used as follows:

Pin	Use
2	J1850 Bus+
4	Chassis Ground
5	Signal Ground
6	CAN High (J-2284)
7	ISO 9141-2 K Line and ISO/DIS 14230-4
10	J1850 Bus
14	CAN Low (J-2284)
15	ISO 9141-2 L Line and ISO/DIS 14230-4
16	Battery power (+)

Additional pins may be wired on your car - these may be used by the vehicle Manufacturer for other purposes.

Which protocol is used by each manufacturer?

As a rough guide, the protocols are generally found on cars from the following manufacturers:

Protocol	Manufacturers
J1850 VPW	General Motors, Chrysler...
J1850 PWM	Ford models to 2003 with EEC-V engine management system, this includes: Ford Cougar (all UK models), Ford Puma (1.6 and 1.7), Ford Fiesta Zetec models to 2003, Ford Mondeo Zetec models to 2003, Ford Focus to 2003 (and some of the newer Ford-based Jaguars , e.g. S-Type)...
ISO 9141 & KWP 2000	Most European and Asian manufacturers, e.g. Alfa Romeo, Audi, BMW, Citroen, Fiat, Honda, Hyundai, Jaguar (X300, XK series and X-Type), Jeep, Kia, Land Rover, Mazda, Mercedes, Mitsubishi, Nissan, Peugeot, Renault, Saab, Skoda, Subaru, Toyota, Vauxhall, Volkswagen (VW), Volvo ...
CAN	Ford 2004+ Fiesta, Fusion, Mondeo, Focus models Mazda RX-8... Vauxhall Vectra 2003+ model Most new models from approx. 2004 - CAN must be used for EOBD engine diagnostics by all manufacturers by 2008...

Only the latest scan tools and code readers can be relied upon to read the diagnostic information through the EOBD socket.

'Check Engine' light



The 'Check Engine' warning light on the dashboard is often the first sign that the car owner knows about a problem with his car.

This provides very little information to the owner, or to the technician when asked to investigate the problem.

Problem diagnosis

With the modern tools, skilled technicians should be able to diagnose and solve many of the problems, which prior to this, required the sophisticated console tools of main dealers.

New technology

The introduction of European on-board diagnostics standards has opened up new opportunities for car workshops and owners.

A range of low-cost tools are now available to read and clear error codes, to view live/stored readings from sensors within the car, and to switch off the 'Check Engine' light.

What information is available?

EOBD systems monitor and store information from sensors throughout the car, e.g. air flow sensors, oxygen sensors, etc.

Sensor values outside an acceptable range will trigger a Diagnostic Trouble Code (DTC). The Scan tools can display and interpret these codes. Some Scan Tools will also provide 'Live Data' of the sensors output.

EOBD or OBD II?

On-Board Diagnostics, or OBD, was the name given to the early emission control and engine-management systems introduced in cars. There is no single OBD standard and each manufacturer, often using quite different systems (even between individual car models).

OBD systems have been developed and enhanced, in line with United States government requirements, into the current OBD II standard.

The OBD II Federal requirements apply to cars sold in the United States from 1996.

EOBD is the European equivalent of the American OBD II standard, which applies to petrol cars sold in Europe from 2001 (and for diesel cars 3 years later)

Why do OBDII and EOBD tools not work on all cars from 1996 in the UK and Europe?

Some of our most frequently asked questions on our OBDII and EOBD tools are:

"I have seen these/similar products advertised as working on all 1996 and newer cars - why don't yours?"

"I've just bought an OBDII/EOBD tool from someone else that was advertised as working with all 1996 and newer cars.

Why doesn't it work on my [1999 Vauxhall Vectra]?"

Here is the answer...

In 1996 in the United States, a Federal Law came into force requiring **all US-sold cars** to be OBDII compliant. Most OBDII tools are therefore advertised as working with all cars from 1996.

The OBDII Federal Law applied **only to cars sold in the US**.

In the UK and the rest of Europe, the equivalent law (European On-Board Diagnostics, or EOBD) did not come into force, and more importantly, was not fully implemented by our car manufacturers, until 2001 for petrol cars (2003/4 for diesels).

Where an OBDII tool is sold in the UK/Europe claiming to work on all cars from 1996, this is highly **unlikely to be the case**.

Even where a seemingly identical car may have been sold in Europe and the US before 2001, from our own testing and research, it is rarely the case that the European model will be OBDII/EOBD compliant.

The fact that we sell these tools as only working with 2001 and newer petrol (and similarly 2003/4 diesels) is due to the fact that we are being honest in the coverage, rather than simply duplicating the sales information from the US.

So do these tools work with any UK/European cars before 2001?

Yes they do, but certainly not across the board, and very rarely back as far as 1996. A few manufacturers that we know have some OBDII/EOBD support (on petrol models) before 2001 are listed below:

Ford (most petrol cars using the EEC-V engine management system)

Jaguar (most models from the beginning of the X300 series)

Volvo (some models)

A few examples of manufacturers that we have had very little success connecting OBDII/EOBD tools on pre-2001 models are:

Vauxhall

Peugeot

Citroen

Fiat

Please be aware that we do not try to sell these tools as something they are not.

What is EOBD2?

EOBD2 is **not** a new version of EOBD. Where EOBD stands for 'European On-Board Diagnostics', EOBD2 actually stands for 'Enhanced On-Board Diagnostics, Second Generation'.

EOBD2 tends to refer to manufacturer-specific features available on some OBDII/EOBD tools to access additional parameters/information from a car, over and above the normal parameters and information available within the EOBD/OBDII standard.

EOBD2 features are normally highly manufacturer-specific, and will usually only be available for a certain car manufacturer, e.g. Ford.

There are, as such, no 'EOBD2 cars', i.e. cars that require an EOBD2 tool to access their diagnostics information. EOBD2 functionality might however allow more information to be extracted from an EOBD/OBDII compliant car.

Introduction to On-Board Diagnostics (OBD) II

On-board diagnostics version II (OBD II) is a system that the Society of Automotive Engineers (SAE) developed to standardize automotive electronic diagnosis.

Beginning in 1996, most new vehicles sold in the United States were fully OBD II compliant and in year 2000, Europe started its own EOBD system.

- ✓ Technicians can now use the same tool to test any OBD II / EOBD compliant vehicles without special adapters. SAE established guidelines that provide:
 - ❑ A universal connector, called the Diagnostic Link Connector (DLC) with dedicated pin assignments.
 - ❑ A standard location for the DLC, visible under the dash on driver's side.
 - ❑ A standard list of diagnostic trouble codes (DTCs) used by all manufacturers.
 - ❑ A standard list of parameter identification (PID) data used by all manufacturers.
 - ❑ Ability for vehicle systems to record operating conditions when a fault occurs.
 - ❑ Expanded diagnostic capabilities that records a code whenever a condition occurs that affects vehicle emissions.
 - ❑ Ability to clear stored codes from the vehicle's memory with a Scan

Tool.

SAE Publications

SAE has published hundreds of pages of text defining a standard communication protocol that establishes hardware, software, and circuit parameters of OBD II systems.

- SAE publishes recommendations, not laws, but the Environmental Protection Agency (EPA) and California Air Resources Board (CARB) made many of SAE's recommendations legal requirements.