

Lucas



Lucas Diesel Systems

Powering Ahead

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LUCAS DIESEL SYSTEMS

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Timeline of innovation

1900 - 1920
The product range grows

The product range extended to include accessories for bicycles, motorcycles and cars, oil, acetylene and electric lamps. Lucas grew by identifying and developing what car manufacturers really needed. The acquisition of Thomson-Bennet Ltd. provided magneto capability for the electrical portfolio and revolutionised nighttime driving in the 20s.



1940 - 1960
The new braking business

In 1943, it acquired the Girling brakes business, adding hydraulic braking to the company's product portfolio.

In 1951, different distribution subsidiaries were established. Milestones reached in terms of new products included the first disc brake fitted to a production car and the introduction of the DPA rotary fuel injection pump.



1870 ————— 1900 ————— 1920 ————— 1940

1870 - 1900
Establishment of the company

Joseph Lucas (Birmingham, 1834) began in 1860 as a dealer in paraffin oil for domestic lamps and soon expanded into the transport market. In 1875 he opened a small workshop with five employees. In 1880, he built a factory at the iconic location on Great King Street.

In 1897, Joseph Lucas Ltd. achieved a leading position in its market and moved into the growing automotive parts and accessories sector.



1920 - 1940
The largest supplier of electrical equipment

With the acquisition of C.A. Vandervell & Co. Ltd and Rotax Ltd., Lucas became the largest supplier of electrical equipment to the majority of British vehicles and the largest accessories manufacturer. In 1930 it incorporated electrical equipment for heavy-duty vehicles, fuel injection pumps for diesel engines and broke into the aviation sector with the establishment of Lucas Aerospace.



1970 - 1990
Lucas adds green to its corporate branding

The group was renamed in 1974 as Lucas Industries and added green to its corporate branding as well as the Lucas diagonal, well-known icons throughout the world.

En 1988, Lucas Automotive began with the production of high-technology engine management and braking systems for the automotive industry around the world.



2000 - 2010
Lucas brand licensing by TRW

In 2003, TRW made the decision to license the Lucas brand to specialist licensees who could proceed with the development and investment of the Lucas programs.

Lucas continues to grow thanks to its expansion into new markets and to the launching of new products.

The brand maintains its success thanks to its ongoing innovation and to the contribution of solutions that prepare for the future.



1960 1970 1990 2000 2016

1960 - 1970
Expansion across Europe

Lucas expands throughout Europe with the opening of brake manufacturing plants in France and Germany, diesel partnerships in France and Spain and the growth of its after-sales network. Lucas Service became a global company, exporting to over 130 markets with 4,000 authorised outlets.



1990 - 2000
Amongst the top 10 manufacturers

The merger to create Lucas Varity in 1996 resulted in the emergence of one of the world's top ten suppliers of car parts. This was followed by the acquisition by TRW in 1999, a global market leader in automotive safety.



2016
2016 Remaned, exclusive Lucas Diesel license

Remaned is proud to have been appointed as an exclusive Lucas Diesel Systems licensee for Europe, Central and South America. Lucas products will therefore continue with the tradition, innovation, quality and reliability typical of Remaned.

Lucas Diesel in the world

LUCAS TODAY

The Lucas brand has been offering top quality automotive products throughout the world for over 140 years. Its international success and reputation are based on providing the widest range of

products that offer exceptional technology and innovation. Lucas currently operates throughout the world, and is continuously developing new market opportunities.

LUCAS DIESEL SYSTEMS

Our top quality diesel injection product range includes over 1,200 items of remanufactured products and over 4,100 diesel components. And we're continuing to grow, as we have been selling our products for longer than any other car parts brand in the world.

Our confidence in and commitment to the Lucas brand, is of unparalleled quality, tradition and global recognition, merged with our extensive experience in the diesel sector. As a result we already have several production centres and regional

headquarters at different international locations. And we are continuing with our constant expansion by gradually opening up new Lucas dealers who already operate with our diesel product range at various points across the world.

Our famous green boxes have, for decades, been an authentic symbol and an icon for workshops throughout the world, given that we have always provided products that our clients trust entirely, throughout the years.





Production centres
(Spain, UK, Brazil)



Regional headquarters
(Spain, UK, Brazil, Panama, UAE)

Product range

REMAN



Fuel Injection Pumps

We have been covering the whole auto market of vehicles since the 80s, offering the widest range of diesel pumps in the market.



Common Rail Pumps

Since its introduction into the market in 1997, it continues to be the system most commonly used by car manufacturers. Lucas gives us access to all of the brands that are currently being sold.



Common Rail Injectors

With over 450 items, Lucas offers the possibility of accessing 93% of the CR injectors in the market.



Unit Injector Pumps

Although cars are no longer manufactured with pump injectors, they are still among the most sold diesel products. Lucas supplies the full range for the VAG group.



Diesel Fuel Injectors

Although they have not been assembled in vehicles for years now, the current fleet of vehicles continue to make use of them. Lucas offers them within its range of products.



Industrial Diesel Unit Injector Pump & Industrial Diesel Unit Pump

As leaders in this sector, we incorporate diesel pump injectors for industrial vehicles in order to fulfil all sectors of the market.



References

Fuel Injection Pumps	Common Rail Pumps	Common Rail Injectors	Unit Injector Pumps	Diesel Fuel Injectors	Industrial Diesel Unit Injector Pump & Industrial Diesel Unit Pump
Bosch VE	Bosch CP1	Bosch CRI1	Bosch UIS - PDE-P1	Lucas	Bosch UIS – PDE
Bosch VE-EDC	Bosch CP1H3	Bosch CRI2	Bosch UIS - PDE-P1.1	Bosch	Bosch UPS – PLD
Bosch VP 29/30	Bosch CP3	Bosch CRIN	Bosch UIS - PDE-P1.3	Delphi	Delphi EUI
Bosch VP 44	Bosch CP4	Bosch Piezoelectric	Bosch UIS - PDE-P1.4	Denso	Caterpillar GP
Lucas DPC	Delphi DFP1	Delphi DFI 1.2	Bosch UIS - PDE-P1.5		
Lucas DPC-N	Delphi DFP3	Delphi DFI 1.3	Bosch UIS - PDE-P2		
Denso VE	Denso HP2	Delphi DFI 1.4			
Denso ECD	Denso HP3	Denso X1			
Zexel NP-VE	Denso HP4	Denso X2			
	Siemens - VDO CR	Denso G2			
		Siemens - VDO CR			

Production system

The quality of a product is directly linked to the level of organisation at the production centre. To increase the productivity and the quality of our products, we have developed our own

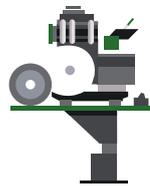
system, which is implemented in all of our plants throughout the world in order to guarantee identical levels of productivity and quality control in all of our products, regardless of their production site.



1 Checking of pumps and injectors



2 External treatment of the product



3 Dismantling and technical verification



4 Product inspection



5 Substitution of damaged products



6 Assembling of the product



7 Checking on test bench



8 Quality control



9 Labelling with a QR code



10 Packaging



11 Delivery to the client

Packaging system

At Lucas Diesel we are convinced that an excellent product can be achieved by establishing the best quality standards in each of the processes we carry out; and when we deliver our products to our clients too. Our packaging system is perfectly designed, developed and manufactured to supply products with the highest level of safety, protection, guarantee and image possible.

Our green boxes, of different sizes adapted to their contents, are the icons that identify us from our production plants to our clients' shelves.

Our labels, produced specifically for each part include technical details, a QR traceability code and a brand quality hologram. The interior, taking care of the details in all aspects, includes additional information with technical specifications.

Our boxes are manufactured with the best materials and adapted to the dimensions and technical requirements of each product.



Our labels, produced specifically for each part include technical details, a QR traceability code and a brand quality hologram.



1

Lucas item and an image of the type of product

2

Original reference of the product

3

Description of the product in 6 languages

4

Monitoring of traceability using the QR code

5

Product reference in barcode

6

Authenticity hologram of the Lucas brand

7

Guarantee seal

Product range COMPONENTS

Lucas Diesel offers the sector the widest range of parts breakdowns for all the references of pumps and injectors diesel market.



Injector CR Valves



Injector Repair Kits



Pump Repair Kits



Electric Solenoids



Head Rotors



Plungers



Plungers CR Pump



Nozzles



Delivery Valves

References

Injector CR Valves	Injector Repair Kits	Pump Repair Kits	Electric Solenoids	Head Rotors
Bosch CRI1	Bosch CRI1	Bosch CP1	Bosch VE	Bosch VE
Bosch CRI2	Bosch CRI2	Bosch CP1H3	Bosch VE-EDC	Bosch VE-EDC
Bosch CRIN	Bosch CRIN	Bosch CP3	Lucas DPC	Lucas DPC
Delphi DFI 1.2	Bosch Piezoelectric	Bosch CP4	Lucas DPC-N	Lucas DPC-N
Delphi DFI 1.3	Delphi DFI 1.2	Delphi DFP1	Denso VE	ECD Denso
Delphi DFI 1.4	Delphi DFI 1.3	Delphi DFP3	Denso ECD	VE Zexel
Denso X1	Delphi DFI 1.4	Denso HP2	VE Zexel	
Denso X2	Denso X1	Denso HP3		
Denso G2	Denso X2	Denso HP4		
	Denso G2	Siemens - VDO CR		
	Siemens - VDO CR	Bosch VE		
	Bosch - Conventional	Bosch VE-EDC		
	Lucas - Conventional	Bosch VP 29/30		
	Bosch UIS - PDE-P1	Bosch VP 44		
	Bosch UIS - PDE-P1.1	Lucas DPC		
	Bosch UIS - PDE-P1.3	Lucas DPC-N		
	Bosch UIS - PDE-P1.4	Denso VE		
	Bosch UIS - PDE-P1.5	Denso ECD		
	Bosch UIS - PDE-P2	Zexel NP-VE		
		In - line pump		
Plungers	Plungers CR Pump	Nozzles	Delivery Valves	
Bosch VE	Bosch CP1	Bosch Type DL	Bosch Type P	
Bosch VE-EDC	Bosch CP1H3	Bosch Type DLL	Bosch Type M	
Lucas DPC	Delphi DFP3	Bosch Type DLLA	Bosch Type A	
Lucas DPC-N	Denso HP3	Bosch Type DSLA	Bosch Type H	
Denso VE	Siemens - VDO CR	Bosch Type DN		
Denso ECD		Lucas - Conventional		
VE Zexel		Delphi CR		
		Denso CR		
		Siemens - VDO CR		

Traceability

THE BEST TRACEABILITY SYSTEM FOR OUR PRODUCTS

All of our products are identified with an original Lucas label, which incorporates a QR code.

This code is linked to our traceability system, by means of which our clients can check the results of the tests and the original technical bulletins that enable them to ensure, in addition, the correct manner of assembling the product.





**ACCESS TO THE
TECHNICAL
INFORMATION**

The easiest way to access to the technical information of each product, through the scanning of a QR code.



Always innovating and making it easy for you.

- Easy to use
- Transparency of the product
- Complete information
- Total control of the product

Quality



OUR FUNDAMENTAL VALUE IN THE APPLICATION OF EXCELLENCE

The quality is our fundamental value in the application of excellence in all Lucas Diesel centres and plants in the world.

Our ultimate aim is clear; to satisfy our clients by fulfilling their expectations in

terms of quality, price and availability. In order to comply with this, Lucas Diesel applies a series of principles that are rigorously followed by its entire team of professionals.



Total quality

In order to comply with the expectations of the client, total quality is required of Lucas Diesel and each of its suppliers. There is no margin for error or for risk.



Guarantee

Lucas has over 140 years of history which speaks volumes. Clients from all corners of the world have trusted and continue to trust in our brand's values every day.

We take pride in this and it is something that we work towards to offer the market products of the best quality, always under our own strict production standards and processes.



Production system

The quality of a product is directly linked to the level of organisation at its production centre. In order to improve the productivity and quality of the products, Lucas Diesel has developed its own production system, which is applied in all of its plants across the world.

In this manner, we can guarantee the same levels of quality and productivity in all of our products, regardless of where they have been manufactured.



R+D department

Thanks to the three Lucas Diesel R+D departments located in Spain, the United Kingdom and Brazil, we manage to continuously develop all of our production processes, and launch and manage new projects on an ongoing basis. This aspect is key to continue growing and extending new lines of business to new markets.



Approval of suppliers

Thanks to the perfect relationship with all of our suppliers, at Lucas Diesel we manage to work with the same objectives towards shared success. This partnership enables us to innovate and develop our productivity jointly and to offer ongoing improvement in quality.

At Lucas Diesel we only work with a limited number of suppliers, who we consider key partners in achieving our success.



Involvement of employees

Each employee, regardless of their position, plays a fundamental role in the quality and fine-tuning of processes on a daily basis. Consequently, we work to recognise what their abilities are and strengthen them by means of the Lucas Academy or an ongoing improvement of the production processes.

All of the employees are also invited to participate actively in the proposal of elements of improvement for their daily work and for the optimal growth of the company.

Green spirit

FAVOURABLE FOR THE ENVIRONMENT

Remanufacturing is an industrial process that consists of the reuse of a product or part that has reached the end of its useful life and whose remanufacturing offers a level of performance and quality equal to or greater than that of the new OEM products.

The use of remanufactured products greatly reduces the impact on the environment compared to newly manufactured products, therefore significantly reducing the production emissions gases and the generation of waste.

During the remanufacturing process the damaged elements are replaced and the remaining components that are in specification are reused.

It is our responsibility, as manufacturers too, to take care of the environment by implementing processes that avoid any type of contamination. And to make the most of the natural resources used in said manufacturing system.

OPTIMAL FOR BUSINESSES



Access to remanufactured products

The client has access to remanufactured products, which are more economical and sustainable than newly manufactured products.



Better quality standards

The quality standards are the same or even better than those of a new OEM product, as we apply the most advanced treatments to offer the highest level of quality.



Lower cost

The consumer has access to products of the highest level of quality at the most competitive prices.





111 kg.



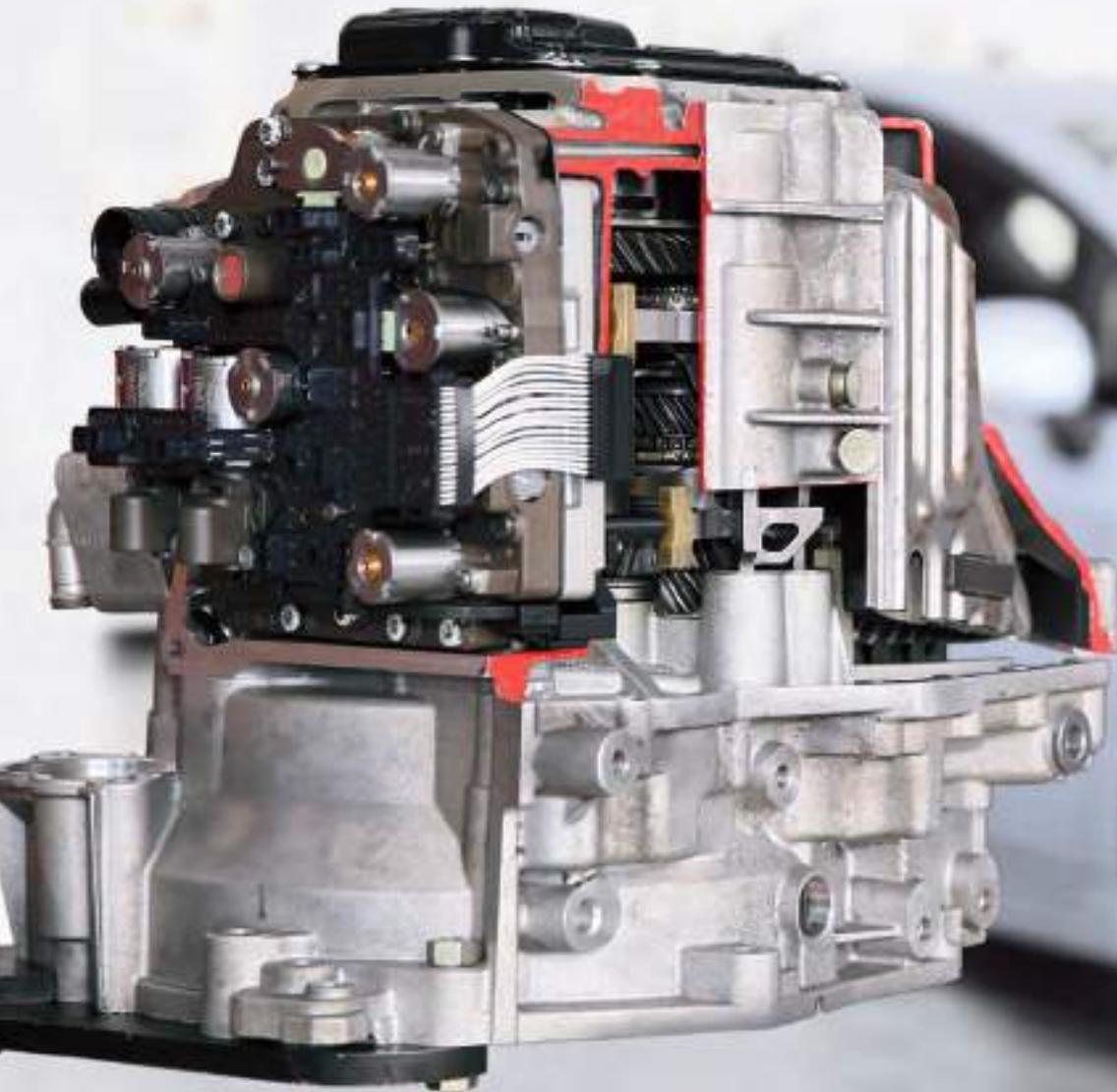
During the process of manufacturing of a **conventional engine**, **111 kg of CO₂** is released into the atmosphere

4 kg.



In contrast, the **remanufacturing process** of the same equipment **only produces 4 kg of CO₂**

Lucas





Lucas Academy

Trust Lucas

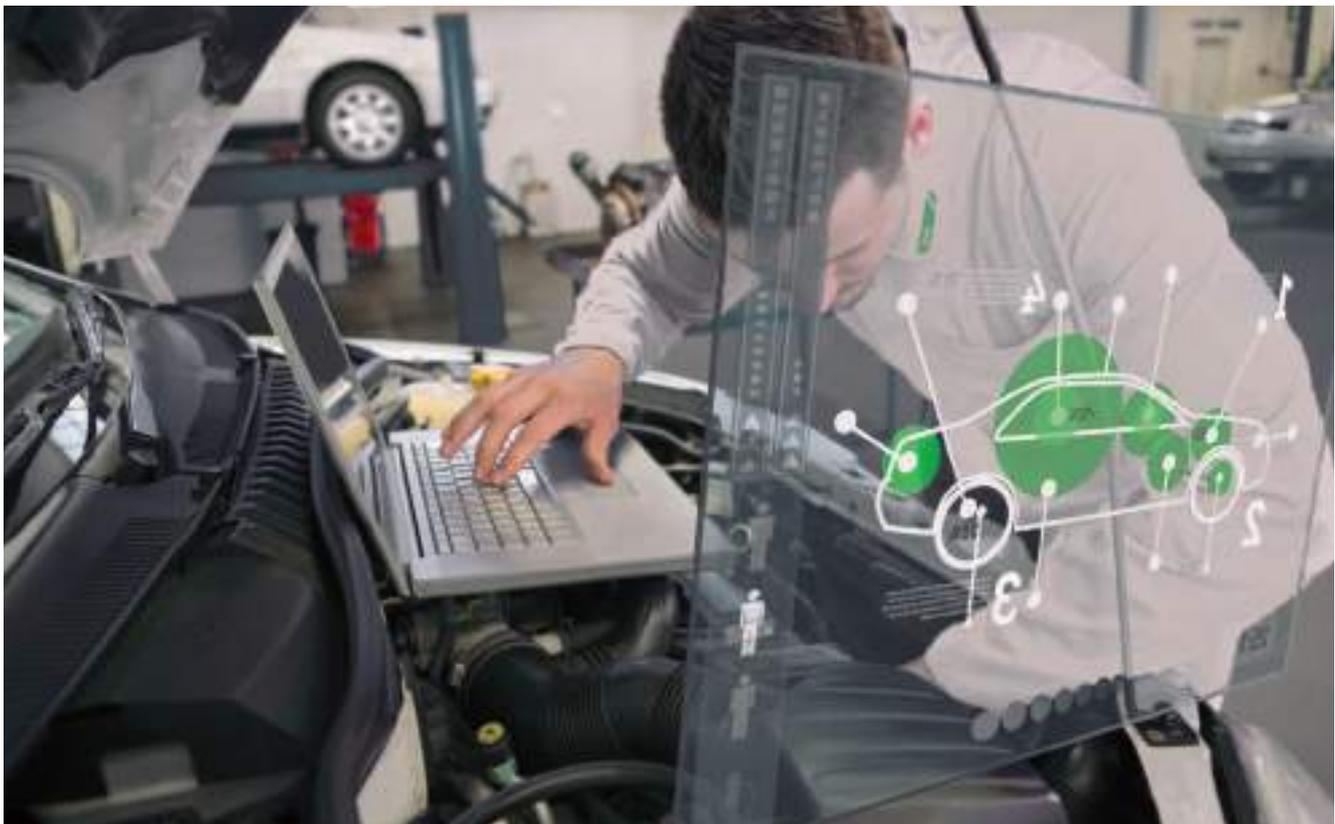
Lucas Academy

EXCELLENCE THROUGH TRAINING & TECHNICAL ASSISTANCE

Lucas Academy is a global company geared towards training in automotive technology. Its central office is in Hastings (East Sussex) and has another four additional fully operating locations in the United Kingdom: London, Manchester, Birmingham and Glasgow.

Our aim is to improve the quality of our customer service worldwide and support our international customers.

Our state-of-the-art facilities include fully equipped classrooms and portable devices that enable us to take our courses to wherever our clients require them. This makes our network an international one that offers personalised and a la carte training programmes.



Customised, in-person, practical and online training, adapted to the needs of each client.

High level training experience

The engine industry is developing at a faster rate now than it ever has throughout its history and the systems and technology in this regard are increasingly complex and demanding. Because of this, we are committed to creating and providing courses and offering the most precise and up-to-date resources that our industry and sector can offer, both in-person and online.

A large group of professionals who are specialised and qualified in the automotive sector will take care of training for each participant depending on their needs and personal requirements.

Lucas Academy offers high quality learning experiences. Our courses have been developed by professional instructors with extensive experience in the automotive industry. Their extensive background and high capacity to share their knowledge in a clear and structured manner ensure an exceptional training experience.

All of the technical courses offered by Lucas Academy are endorsed by the IMI (Institute of the Motor Industry), a leader in the qualifications and accreditations market within the automotive sector.

Immediate and professional technical support

The client and the workshop may encounter many technical problems but they do not always have the required knowledge about each of the systems on all the cars on the market.

We can help them by offering them assistance and directly providing them with a response about how to resolve their problems.



AUTOMOTIVE TECHNICAL TRAINING



E-LEARNING



TECHNICAL ASSISTANCE

Automotive technical training

COURSE SUMMARY

Level 1 **SPECIALIST IN VEHICLE MAINTENANCE AND SAFETY**

Maintenance of Vehicles		Active and Passive Restraint	
MV01	Maintenance of Vehicles I	AE01	Safety Systems ABS, ASR & ESP Programme
MV02	Maintenance of Vehicles II	SA01	Assistance Systems for Driving
MNT01	Maintenance of Vehicles with new Technologies	AP01	Airbags and Pretensioners
GEDI	Steering Geometry	SS01	Diagnosis and Maintenance of Restraint Systems
Comfort			
AA01	A/C System in the Vehicle		
AA02	Diagnosis and Maintenance of A/C Systems Programme		
EAC01	Specialist in A/C Systems		

Once all the training courses regarding "Maintenance of Vehicles", "Comfort" and "Active and Passive Restraint"; have been completed you will gain the certificate of Specialist in Vehicle Maintenance and Safety.

Level 2 **SPECIALIST IN ELECTRICALS & ELECTRONICS SYSTEMS AND NEW TECHNOLOGIES OF A VEHICLE**

Electricals & Electronics Systems		New Technologies	
EB04	Basic Electronics and Electrical Components Programme	ID10	Hybrid and Electric Vehicles (plug in) Programme
IE01	Electrical schematics I	GLP01	LPG Fuel System
IE02	Electrical schematics II		
ED01	Auto Diagnosis & EOBD Programme		
MC01	Multiplexing & CAN BUS		

Once all the training courses regarding "Electricals & Electronics Systems" and "New Technologies"; have been completed you will gain the certificate of Specialist in Electricals & Electronics Systems and New Technologies of a Vehicle.

Level 3 **SPECIALIST IN EXHAUST AND ANTI-POLLUTION SYSTEMS**

Exhaust Systems		Anti-pollution Systems	
GDC	Diagnosis of Exhaust Smoke in Petrol and Diesel	DID04	Diagnosis of Anti-pollution Systems Programme

Once all the training courses regarding "Exhaust Systems" and "Anti-pollution Systems"; have been completed you will gain the certificate of Specialist in Exhaust and Anti-pollution Systems.

Level 4 **SPECIALIST IN FUELING SYSTEMS**

Diesel		Petrol Injection	
IDO7	Bosch 2nd Gen Common Rail Injection Programme	FSIO1	Direct Petrol Injection Systems, FSI
IDO10	Bosch 3rd Gen Common Rail Injection Programme	Exhaust Systems	
IDO8	Delphi Common Rail Injection Programme	GDC	Diagnosis of Exhaust Smoke in Petrol and Diesel

Once all the training courses regarding "Diesel", "Petrol" and "Exhaust Systems"; have been completed you will gain the certificate of **Specialist in Fueling Systems**.

Level 5 **SPECIALIST IN AUTOMOTIVE MOTION**

Traction		Superchargers	
CC01	Automatic Gearboxes. TIPTRONIC System	SOB01	Superchargers Programme
CC02	Automatic Gearboxes with Double Clutch DSG System		
RCA01	Repair and Maintenance of Automatic Gearboxes		

Once all the training courses regarding "Traction" and "Superchargers"; have been completed you will gain the certificate of **Specialist in Automotive Motion**.

Level 6 **MASTER IN AUTOMOTIVE SYSTEMS**

Once all the courses above are completed, you will gain the certificate of specialist in **Master in Automotive Systems**.

THREE TYPES OF CERTIFICATE

COURSE



SPECIALIST



MASTER



TRAINING COURSES

ELECTRICITY, ELECTRONICS AND DIAGNOSIS

16H
DURATION

EB04



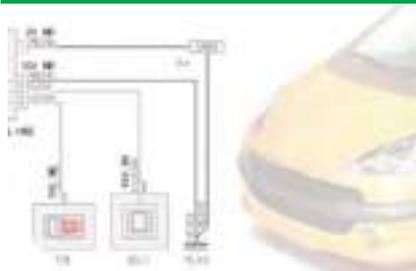
Electricals and electronics systems of a car

OBJECTIVES

Basic knowledge of a vehicles electrics, learning how to deal with the different electrical circuits, its functioning and basic repair.

Basic knowledge of electricals and electromagnetism. How to use a multi-meter in a vehicle. Checking the functions of sensors and actuators which are involved in the correct running of the engine, security and comfort.

IE01



Electrical schematics I (PSA, Ford, Vauxhall and VW)

OBJECTIVES

Identify and interpret the original schematics of a car manufacturer and to find out about the electrical breakdowns in makes such as: PSA, Ford, Vauxhall and VW.

Reading and interpreting schematics of PSA, Ford, Vauxhall and VW. Particular characteristics of electrical schematics for each mark. Schematics reading and resolution of breakdowns. Repair breakdowns on a vehicle using these schematics.

IE02



Electrical schematics II (Renault, Toyota, Mercedes and BMW)

OBJECTIVES

Identify and interpret the original schematics of a car manufacturer and to find the electrical breakdowns in marks such as: Renault, Toyota, Mercedes and BMW.

Reading and interpreting schematics of: Renault, Toyota, Mercedes and BMW. Particular characteristics of electrical schematics for each mark. Schematics reading and resolution of breakdowns. Repairs of breakdowns on a vehicle using these schematics.

MC01



Multiplexing & CAN-BUS

OBJECTIVES

Acquisition of knowledge for the systems and communication protocols of multiplex data and to diagnose the breakdowns in devices involved in vehicle communications.

Identify the protocols in the communication networks. Characteristics of the communication systems (CAN, LIN, MOST, VAN, FLEXRAY). Precautions in repairing vehicle communication networks. Checking and diagnosis of the common failures.

ELECTRICITY, ELECTRONICS AND DIAGNOSIS**16H**
DURATION**ED01****Autodiagnosis & EOBD****OBJECTIVES**

Identify and analyse different engine parameters involved in the diagnosis of the vehicle.

Interpreting the parameters and values in a diagnosis. Knowledge of the operation mode for OBD and EOBD. Methods of diagnosing component failures in both petrol and diesel engines.

EXHAUST SYSTEMS**16H**
DURATION**GDC****Diagnosis of exhaust fumes in petrol and diesel****OBJECTIVES**

Identify the sources of pollution in the vehicle, composition of the exhaust fumes, anti-pollution systems and to interpret their values to know the engine's condition.

To learn about the methods of measuring exhaust fumes. Reasons for contaminant emissions in the engine. Diagnosis of breakdowns in an engine according to exhaust fumes analysis.



DIESEL INJECTION**16H**
DURATION**ID03****Siemens diesel injection****OBJECTIVES**

Acquire a strong knowledge to repair, maintain and diagnose the different electrical and electronic devices involved in the Siemens injection system.

Characteristics of each injection system (pumps, injectors, sensors, engine management unit). Troubleshooting and functioning of the components of Siemens diesel systems. Diagnosis and repair of the most common breakdowns in the injection systems.

ID05**Delphi diesel injection****OBJECTIVES**

Acquire a strong knowledge to repair, maintain and diagnose the different electrical and electronic devices involved in the Delphi injection system.

Characteristics of each injection system (pumps, injectors, sensors, engine management unit). Troubleshooting and functioning of the components of Delphi diesel systems. Diagnosis and repair of the most common breakdowns in the injection systems.

ID07**Injection Common Rail 2nd Gen** (Bosch, CP3, CP1H)**OBJECTIVES**

Recognizing the components, functioning and strategies of Bosch's CP3 and CP1H Common Rail second generation injection system.

Characteristics of the components involved in fuel delivery. Location and functioning of the components of Bosch diesel systems. Diagnosis of most common breakdowns in this system.

ID10**Injection Common Rail 3rd Gen** (Bosch, CP4)**OBJECTIVES**

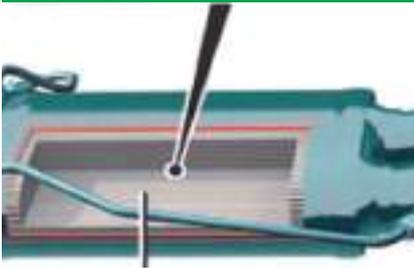
Recognizing the components, functioning and strategies of Bosch's CP4 Common Rail third generation injection system.

Characteristics of the components involved in fuel delivery. Location and functioning of the electrical components of the system. Diagnosis of most common breakdowns in this system.

DIESEL INJECTION**16H**
DURATION**SOB01****Superchargers****OBJECTIVES**

Identify the different methods and functions of the superchargers.

Characteristics of each type of superchargers. Functioning of superchargers. Volumetric classification of superchargers and turbochargers. Procedure to diagnose the most common breakdowns.

ANTI-POLLUTION SYSTEMS**16H**
DURATION**DID04****Diagnosis and maintenance of anti-pollution systems****OBJECTIVES**

To learn about anti-pollution components in a vehicle and to carry out diagnosing, testing, and maintenance of the main systems in petrol and diesel vehicles.

Diagnosis of breakdowns in components involved in the reduction of polluting gases, before the combustion chamber (EGR, mixture regulation, Lambda sensor). Testing and diagnosis of components that reduce the polluting gases after the combustion chamber (Lambda sensor, catalyst, FAP, DPF, SRC).



PETROL INJECTION

16H
DURATION

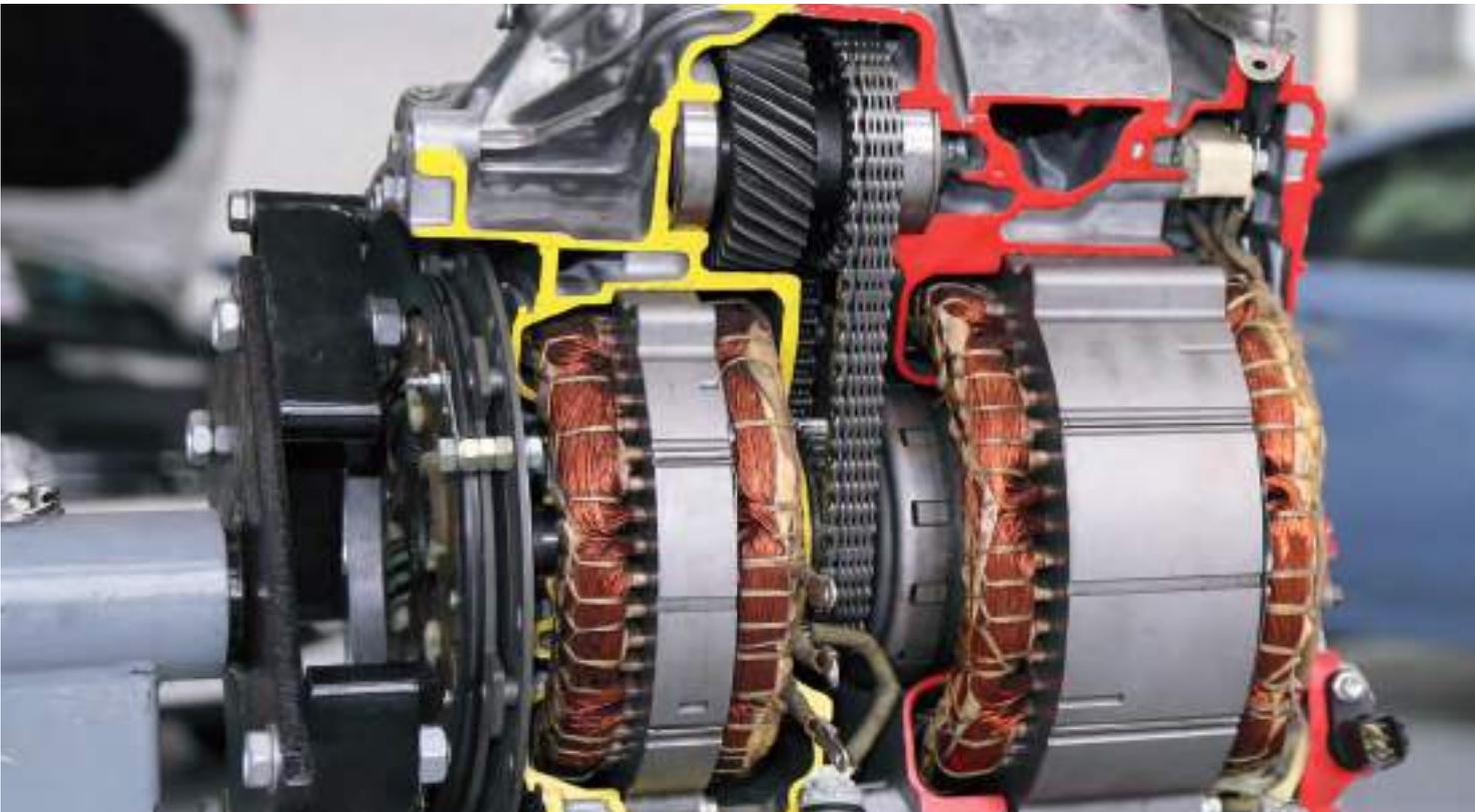
FSI01

Direct petrol injection systems-FSI

OBJECTIVES

To understand the functioning, diagnosis and repairing of components involved in direct petrol injection systems.

Characteristics of the components in an injection system. Location and functioning of the electrical and mechanical components of the system. Diagnosis and repairing of the most common breakdowns in the system.



NEW TECHNOLOGIES**16H**
DURATION**ID10****Hybrid and electric (Plug-in)****OBJECTIVES**

To understand the functioning, maintenance, basic characteristics and security precautions in the components assembled in the vehicles.

Differences between the main hybrid systems on the market. Functioning, diagnosis and maintenance of a HSD system. Current regulations of high voltage in vehicles. Security precautions and risk prevention.

GLP01**LPG fuel system****OBJECTIVES**

Knowing the main characteristics of LPG injection and how to diagnose breakdowns.

Understand about the components of the liquid gas system. Characteristics and differences between aerated and liquefied injection. Installation procedure of the LPG system into the vehicle and to locate the components. Procedure to diagnose and repair the most common breakdowns.



TRACTION

16H
DURATION

CC01



Automatic gearboxes. TIPTRONIC system

OBJECTIVES

Acquire in depth knowledge regarding the functioning, management and diagnosis of automatic gearboxes.

Characteristics and components of the Tiptronic system. Relationship of the gear ratios of speed, clutch and brakes. Maintenance for the Tiptronic System. Diagnosis and procedures to repair breakdowns.

CC02



Gearboxes with double clutch. DSG system

OBJECTIVES

Identify and analyse different components of gearboxes with a double clutch.

Mechanical and Hydraulic configuration for this system. Management of the automatic gearboxes with double clutch. Procedure to repair and maintain the DSG system. Diagnosis of the DSG system (double clutch).

RCA01



Repair and maintenance of automatic gearboxes

OBJECTIVES

Disassembly of an automatic gearbox for checking correct functioning and wear of internal components. Maintenance of an automatic gearbox.

Characteristics and internal functioning of automatic gearboxes. Maintenance procedures for of different types of automatic gearboxes. Disassembly and testing the internal components of automatic gearboxes. Verification of the wear points and most common breakdowns.



ACTIVE AND PASSIVE RESTRAINT**16H**
DURATION**AEO1****Safety control systems (ABS, ASR, ESP)****OBJECTIVES**

Acquire the knowledge to repair and maintain the braking and stability control system as featured in today's vehicle.

Basic specifications for braking and their characteristics. Functioning and diagnosis for the ABS system. Specifications for the ASR system (Traction). Functioning of the ESP system. Maintenance for vehicles with the ESP system.

SA01**Assistance systems for driving****OBJECTIVES**

Recognize and verify the main assistance systems for driving.

Differences among the Start-Stop, speed control and distance control systems. Characteristics and functioning of the parking and steering systems.

AP01**Airbags and pretensioners****OBJECTIVES**

Understand the functioning of active and passive restraints, its characteristics and precautions when they are tested.

General classification of the restraint systems. Precautions and security measures needed when pyrotechnics devices are handled such as airbags and pretensioners. Testing, diagnosis, and procedure of repairs for different components involved in the restraints system.

SS01**Diagnosis and maintenance of restraint systems****OBJECTIVES**

Understand the operation of the restraints and stability control systems (airbag).

Classification of security systems. Functioning, maintenance and diagnosis of the ABS, ASR and ESP systems. Maintenance and diagnosis of the restraints system (airbag, pyrotechnic pretensioners).

COMFORT

16H
DURATION

AA01



A/C system in the vehicle

OBJECTIVES

Learn in depth of the components in the air conditioning system and how to maintain, diagnosis and repair.

Functioning of the refrigeration process in the A/C system. Checking and testing of the A/C components. Diagnoses and repair of the most common A/C breakdowns.

AA02



Diagnosis and maintenance of A/C systems programme

OBJECTIVES

Acquire the knowledge to repair and/or diagnose the electrical components of an A/C system.

Functioning of the electrical components in the A/C system. Specifications of electrical components in the refrigerating system. Diagnosis of potential breakdowns in the A/C system.

EAC01



Specialist in A/C systems

OBJECTIVES

Learn in depth about different A/C systems and to diagnose and repair breakdowns of the system.

Testing the functioning of mechanical and electrical components in the A/C system. Diagnosis and repair procedures for the most common failures.



MAINTENANCE FOR VEHICLES**16H**
DURATION**MVO1****Maintenance of vehicles I****OBJECTIVES**

Understand the maintenance requirement of lubrication, timing, and A/C systems.

Functioning of the lubrication, timing and refrigeration systems. Procedures to maintaining the different systems on a vehicle.

MVO2**Maintenance of vehicles II****OBJECTIVES**

Create maintenance procedures for steering, suspension and braking.

Specifications, functioning and procedures of maintenance for the different suspension and braking systems. Verify and replace the braking components following the correct procedure and fitment.

MNT01**Maintenance of vehicles with new technologies****OBJECTIVES**

Create procedures in order to carry out maintenance of the components which are part of the Hybrid systems, DSG and FAP.

Maintenance for hybrid vehicles with the HSD system. Practical training on maintenance for DSG gearbox. Maintenance of anticontamination systems FAP and DPf.

GEDI**Steering geometry****OBJECTIVES**

Analyse the angles and dimensions of steering geometry to carry out a correct alignment.

Analysis of the steering geometry. Testing and adjustment of dimensions/angles in the steering. Procedure for correct alignment of the wheels. Verification of the damaged components according to the results of the wheel aligner equipment.

E-learning

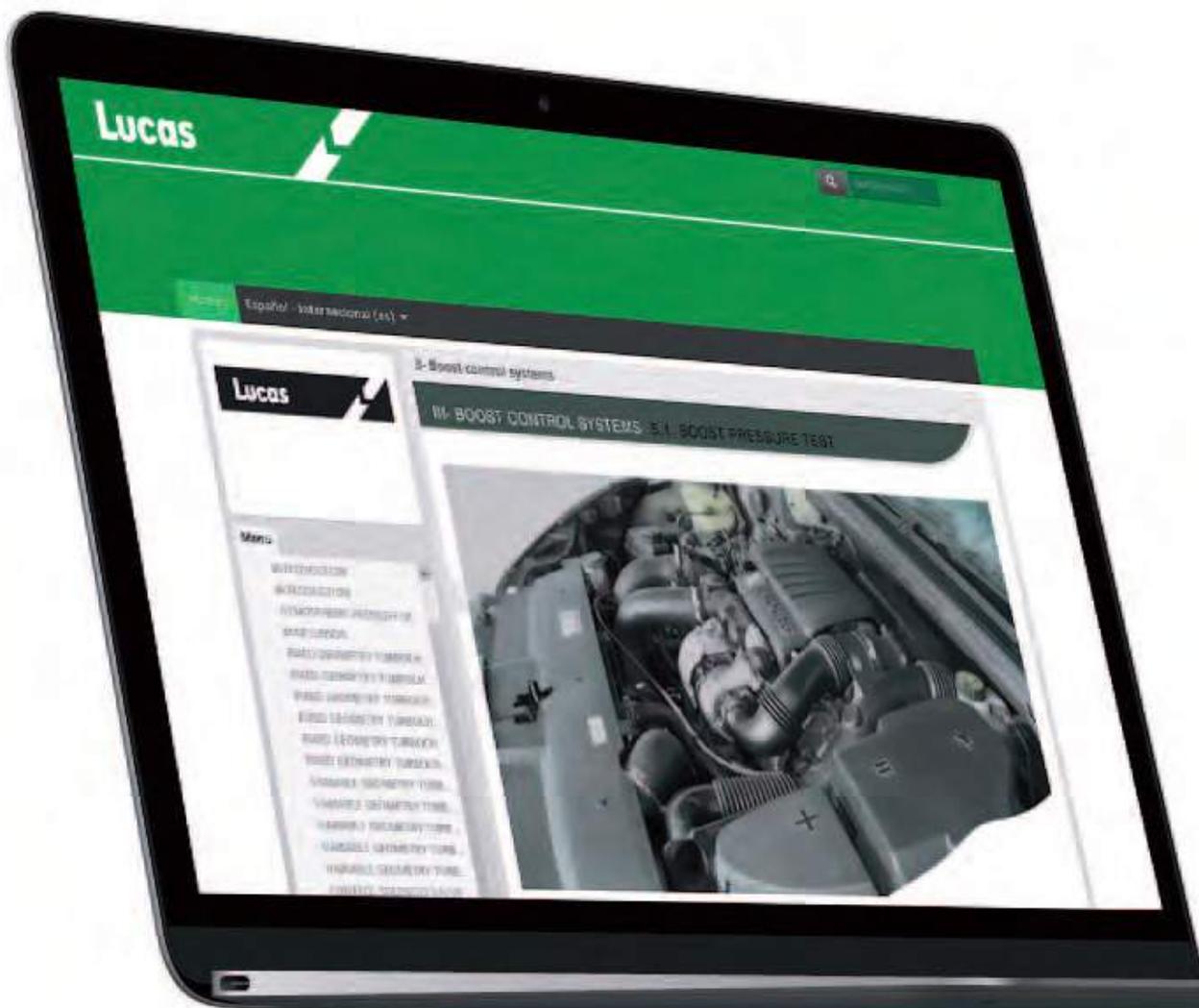
Lucas Academy offers professionals learning experiences of the highest quality, featuring the most innovative content. They therefore reflect not only where the automotive industry stands at this time but also where it will be in the future.

All of our e-learning courses have been designed and developed by expert instructors with extensive experience in the automotive industry. Their in depth

expertise in the practical environment and their ability to share their knowledge in structured and up to date programs ensures a fruitful and satisfactory training experience.

We have state of the art platforms and resources to adequately complete our online training, with the help of videos, 3D infographs and cutting edge multimedia material.

Lucas Academy can provide its e-learning training around the world, anywhere, anytime.





3D multimedia videos.



Fully explanation of the functioning of its component.



Detailed high definition pictures.



Motion graphics & visual effects.



Interactive schemes.

We have the latest generation platform in order to assist online training with the aid of 3D multimedia videos and diagrams. This can be accessed anywhere around the world.

E-LEARNING

100H
DURATION

DAEO1

Diagnosis and repair of electrical breakdowns



OBJECTIVES

Diagnose and analyse the breakdowns in the electrical circuit locating them with diagnostic testing equipment.

Basic knowledge of electricity and electromagnetism. How to use the multimeter in the vehicle. Functioning and testing of the sensors and actuators involved in the current systems of engine, comfort and security.

DID02

Diagnosis of Bosch's Common Rail Systems



OBJECTIVES

To know in depth Bosch's electronic Common Rail injection system. Interpreting the functioning of the systems in order to diagnose any issues using the multimeter, oscilloscope and pressure tester.

Compare the functioning among different generations of injection systems. Differences between pumps, injectors and electrical components. Most common breakdowns among different injection systems. Diagnosis of high and low fuel pressure circuits.

SOB01

Superchargers



OBJECTIVES

Identify the function of different types of supercharging management and its testing.

Characteristics of different types of supercharging. Functioning of volumetric compressors. Classification of superchargers and turbochargers. Procedure to diagnose and repair the most common breakdowns.

E-LEARNING

100H
DURATION

SHI01

Hybrid and electrical vehicles (Plug-in)



OBJECTIVES

To understand the functioning, maintenance, basic characteristics and safety measures of a hybrid system.

Characteristics of components in a hybrid system. Location and functioning of the mechanical and electrical components of the system. Diagnosis and repair of the most common breakdowns in the system.

RCA01

Repair and maintenance of automatic gearboxes



OBJECTIVES

Disassembly of an automatic gearbox verifying its functioning and wear of internal parts while the maintenance of the gearbox is carried out.

Internal functioning in automatic gearboxes. Create maintenance procedures for different types of automatic gearboxes. Disassembly and testing of the internal components in a gearbox. Verification of the wear points and the most common breakdowns.

DSA01

Diagnosis of anti-pollution systems



OBJECTIVES

To know the elements that make up the various anti-pollution systems, the procedures for diagnosis, maintenance and repair of both diesel and petrol engines.

Reduction methods of anti-pollution gases. Fault diagnosis of the elements for reducing of polluting gases before the combustion chamber (ERG, mixture control, Lambda Probe, Catalysts, FAP, DPF, SCR). Checking the wear points and most common failures.

Technical assistance

MANAGEMENT TECHNICAL SUPPORT



The client/workshop can be found in front of a many technical problems but simply does not have the insight into that cars particular systems information. We can assist with this information or directly provide an answer of how to solve the problem, in that case you would contact our technical assistance department by telephone and the process could be handled via two different ways:

TROUBLESHOOTING

Comprehensive technical advice for problem resolution.

DATA BASE

Providing of technical information.

TECHNICAL ASSISTANCE BENEFITS



+450

incoming calls answered every day



99%

of the calls answered in the first call



93%

problems sorted out



2,000

helplines managed



17

technicians with over 10 years of experience

HELPLINE. MANAGEMENT PROCESS OF TECHNICAL INCIDENTS



1. Technical issue

Customer calls to the technical assistance helpline



2. Incidence analysis

Detailed information is collected to make the diagnosis of the problem



Troubleshooting



45,000

Solved cases



EXPERIENCE

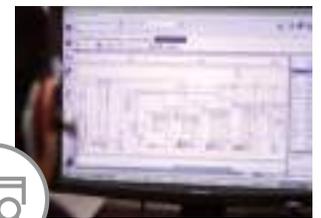
Technicians for multibrand garages and dealerships



QUICK

Solutions

Data Base



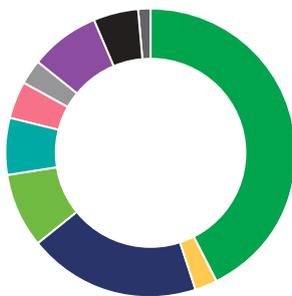
Procedures

- Mounting
- Dismantling
- Reset Service
- Maintenance plan
- Components location
- Bulletins

Data

- Schemes
- Pair Tightening
- Repair times

% Technical Consultations



- 47.3% Fuel systems
- 2.8% AC systems
- 21.3% Guided diagnosis
- 9.2% EOBD
- 7.1% Repair times
- 4.5% Hybrid
- 3.2% LPG
- 8.7% Torques valves
- 5.3% Electric schemes
- 1.5% Oil resets



E-mail



Phone



TROUBLESHOOTING

Case study 1: Class Mercedes B 180 CDI



1. Problem

The oil level/oil pressure warning light is lit.



2. Workshop

Check the entire system lubrication (oil pump, filter...), and everything is right but the problem persists.



3. Assistance Technique

Analysis and collection of information from technical assistance.



Technical solution

Check the particulate filter for correct regeneration operation as it is not automatically being done and the amount of diesel used for this purpose does not burn completely and ends contaminating the engine oil. Perform a test on the DPF system and carry out a forced regeneration. Recheck values and everything should be correct.

Case study 2: Volkswagen Golf IV TDI 130



1. Problem

Oil light is illuminated when engine is running.



2. Workshop

Check the oil level and everything is correct.



3. Assistance Technique

Analysis and collection of information from technical assistance.



Technical solution

Yes, the oil level is correct, our technical information indicates that the bonnet switch is at fault, which is normally on the right side. You are prompted to check for continuity of the switch, and the switch was discovered to be causing this error.

DATA BASE

Our data base is a tool that facilitates quick enquires to a wide range of comprehensive technical information.

Comprehensive coverage

Data provided directly by the manufacturers themselves. (80% of information is obtained by vehicle manufacturers).

Time saving

Interactive illustrations of the localization of components allow our technicians to gather accurate technical information.

It saves our recent lookups do to easily switch between work and another, so that we can restart from the point where we stopped. It saves you time searching by offering access to all of the required technical information on a single screen.

Higher business performance

Designed as an aid to assist workflow professionals in the workshop. Reducing down time. Less time spent on searches equals an increase in efficiency.

Prioritize the checks in our diagnostic solutions with information about the reparation.

Generate revision checklists and professional budgets. Attend more vehicles and increase the level of customer satisfaction.



29,000

vehicle models worldwide



+85,000

schemes and illustrations



500,000

step by step procedures



Key features



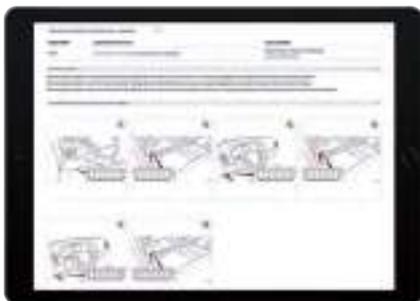
Review guidelines with built-in data
All technical data and illustrations are incorporated directly to save time.



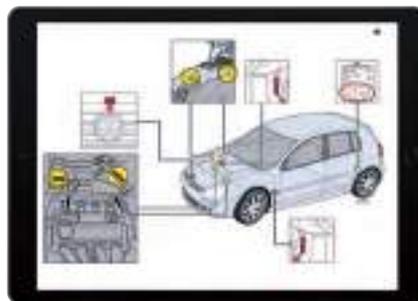
Interactive pages components location
Look for components, see images and access information quickly and easily.



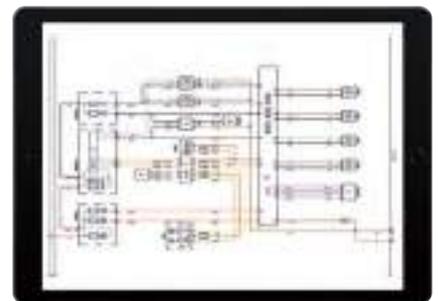
Panel of activity recent
Easily switch between different cars to keep the workflow efficient.



Search fault codes
Search by coder or name of component to instantly locate the information and solutions to the corresponding components.



Illustrations of the components
The images we send are more detailed for a more informative experience. Component locations and indicated illustrations.

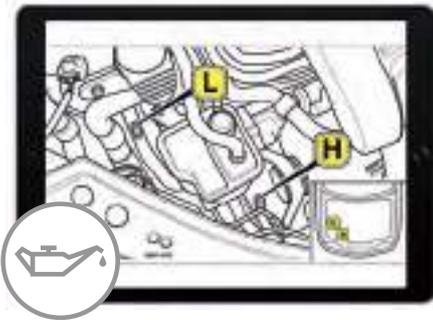


Wiring diagrams
Detailed wiring diagrams showing the path in which the circuit is laid out.



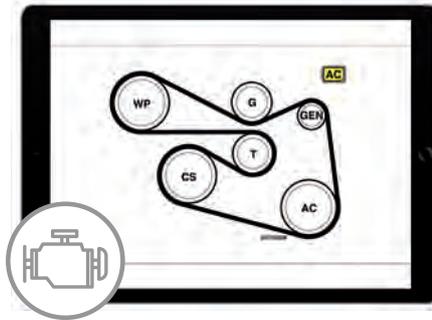
DATA BASE

Technical information



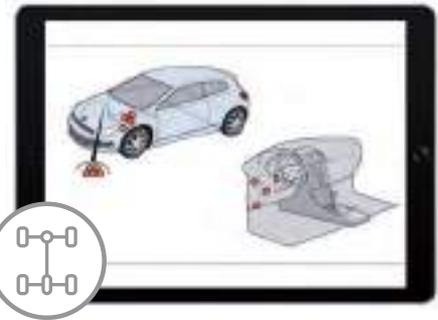
Review

- ▶ Illustrations
- ▶ Review
- ▶ Service indicator
- ▶ Brake change
- ▶ Maintenance of Air Conditioning



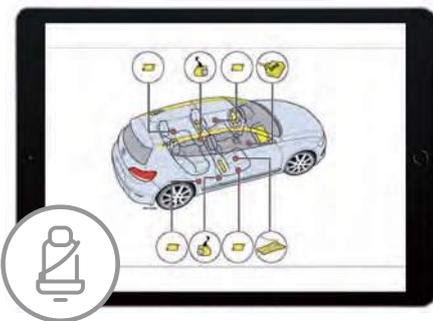
Drivetrain

- ▶ Engine management
- ▶ Command tree(s)
- ▶ Auxiliary and cam drive bells
- ▶ Clutches



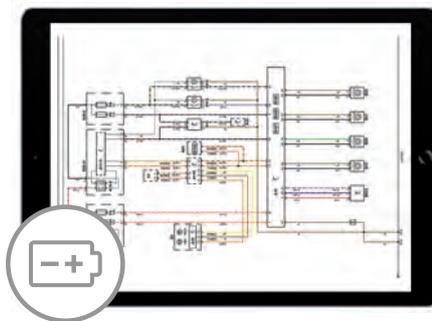
Chassis

- ▶ Antilock Braking System
- ▶ Wheel Alignment
- ▶ Tyre pressures



Body and passenger compartment

- ▶ Airbags
- ▶ A/C Air Conditioning



Electrical wiring schematics

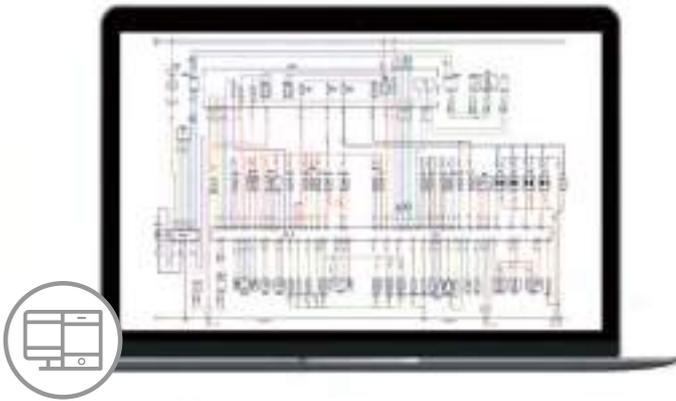
- ▶ Disconnection and reconnection of battery
- ▶ Electric schemes
- ▶ Faulty codes
- ▶ Location of electrical components



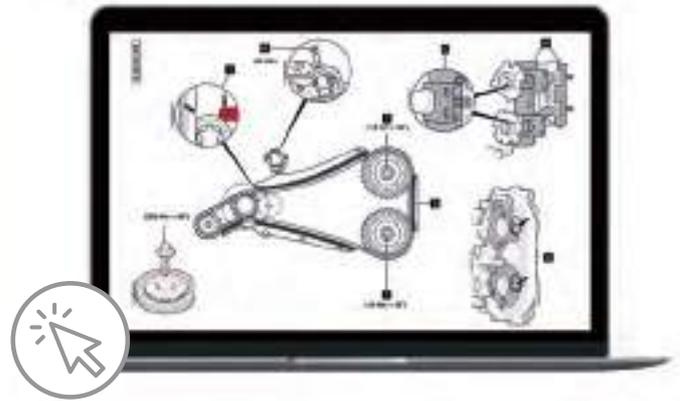
General information

- ▶ Technical specification
- ▶ Repair times
- ▶ Repair information
- ▶ Warning symbols

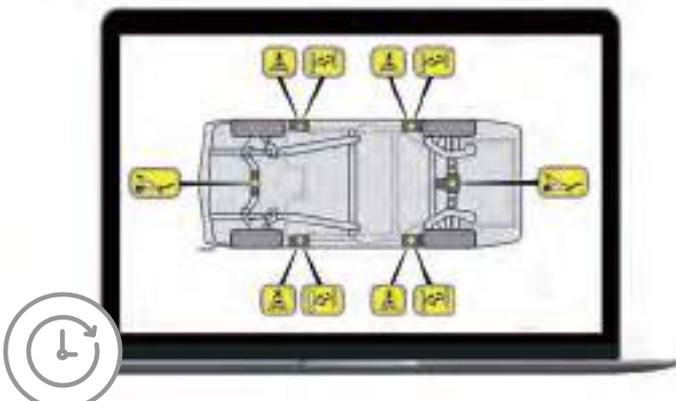
Advantages



Accurate technical information



Instant information provided, with nothing to install



Continuously updated with the most recent data and functions



Created around the reality of the workshop



Quick reply

**Comprehensive
range of technical
information.**

UK - Chichester Road - Ponswood Ind. Estate
TN38 9BG - ST Leonards-On-Sea - East Sussex

SPAIN - Pol. Ind. Morea Sur, 59
31191 Beriáin - Navarra

BRAZIL - Rua Gastão Vidigal, 370
13570-655 - São Carlos - SP

PANAMA - Boulevard Costa del Este
Financial Park Tower - Floor 20 - Costa del Este