BIKE IDC5 - Basic learning

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TEXA EDU

INDEX

Legend:

⚠️ **Warning**

ℹ️ *Information/Notes*

1. INTRODUCTION

This manual aims at providing the most advanced information and knowledge of the TEXA diagnostic software to perform self-diagnosis on vehicles. It is suitable for personnel (technicians and mechanics) who are interested in knowing the basic principles of Self-diagnosis and basic electro-mechanical knowledge. This manual also provides the most detailed technical information for advanced features that are now available with the new generations of electronic control units, equipped in the most modern vehicles.

1.1 Electronic Control Unit: Operation

An Electronic Control Unit is basically a computer that is in charge of managing and verifying the operation of a system. To do this, it needs to obtain information through the SENSORS and change the operating parameters of the system through the ACTUATORS. For operation, it is of course necessary a supply voltage and, in the case of complex electronic board architectures, a data exchange line with other control units (CAN network).
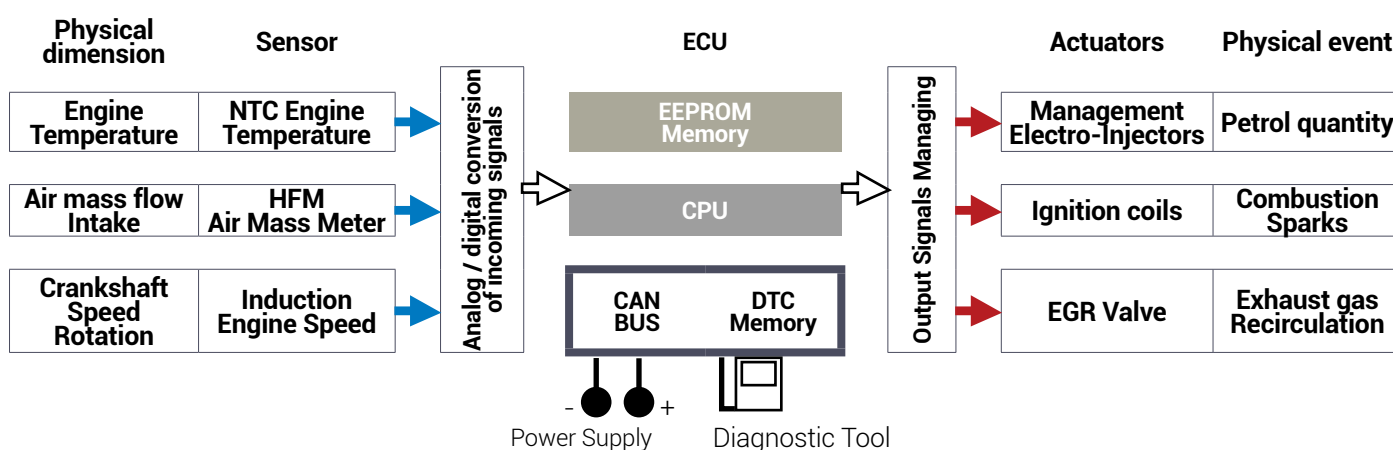
Figure 1

The ability of an ECU to monitor the operation of everything that it is connected to, as well as its own operation, takes the name of Self-Diagnosis.
Self-Diagnosis is the ability of the electronic control unit to control itself and to detect any failures that are stored in a "faulty memory" section.
In order to read and clear the "Fault Memory", you need to use a diagnostic tool that has the function of displaying the detected errors but does not implement any particular fault search.
The latest generation of controllers have an evolved software that can detect a wider range of errors, but the principle remains the same as the self-diagnosis tool reads the detected DTCs that an ECU has detected itself.
On the elements and devices of an electronic system, the control units are able to perform two different types of analysis and control:
1. Electrical analysis and control (short circuit - open circuit - out of range);
2. Analysis and functional control (plausibility of information - self-adaptability).

As a practical example, consider the following cases:
1. **Electrical Type Diagnosis**: It produces signals that cause the display of the "Engine Temperature Sensor" DTC caused by the damage or short circuit in the NTC (Negative Temperature Coefficient) sensor. The control unit identifies the current DTC by an evaluation of the intensity of the current circulating in the sensor or rather that the value of the latter does not fall again within a predetermined range (interval).
2. **Functional Diagnosis**: It is produced by a particular evaluation of the control unit and not by a single direct physical cause. The result of a functional diagnosis is, for example, the "Self-Adaptive Parameters" error that comes through the analysis of the oxygen sensor, which affects the modification of the mixture parameters.

1.2 Ground and Power Supply

Although with some obvious limitations (if the power supply is completely missing, the control unit obviously does not work and is not able to communicate with the diagnostic tool), the control units generally control their power supply.

This is to verify and ensure their regular operation (some units do not work below minimum thresholds) and to handle more appropriately a low power supply situation (inhibition strategies for some non-vital activations and reduced operation of some systems).

Figure 2

It may happen that, due to oxidation or improper fixationinstallation, not all of the ground point fitspoints fit perfectly to the vehicle body, creating a partial contact that results in a smaller section of the conductor: this. This circumstance obviously makemakes the movement of the electrons movement harder by creating friction between them generating heat that is affects bycauses an increase inof the resistance and, thus limiting the current flow to the connected circuits.

The device/system being affected by a lower current flow will suffer an alteration of its operation. thereforeTherefore, it can be stated that in some cases the onlya resistance check using the only ohm meterthe ohmmeter can mislead the technician, thus leading it to expresscausing a series of mistakes or not preciseimprecise diagnostic evaluations.

To makecarry out a resistive control in a dynamic form, using the voltmeter or better the oscilloscope, you have to get used to a simple reasoning.

A fundamental principle of electric matter says "every resistance causes a drop in tension ..".

Taking note of the above, we can probably assert that if there is resistance in an electric current circuit, in the same circuit there is also a voltage drop between the terminals.

1.3 Sensors

This name defines a device that provides useful information to the electronic control unit. The main purpose of the sensors is to transform physical quantities of various types (e.g. temperatures, pressures, vacuum, rotations, displacements, etc. ...) into electrical signals that will be processed by the control unit.

Figure 3

A practical example is the crankshaft:

In this case, there is a specific magnetic induction sensor located in front of a toothed wheel (also known as the phonic wheel) which turns the rotation movement into an electric signal.

This signal is processed by the control unit to determine the speed of rotation of the crankshaft (revolutions) and to check if there are no ignition.
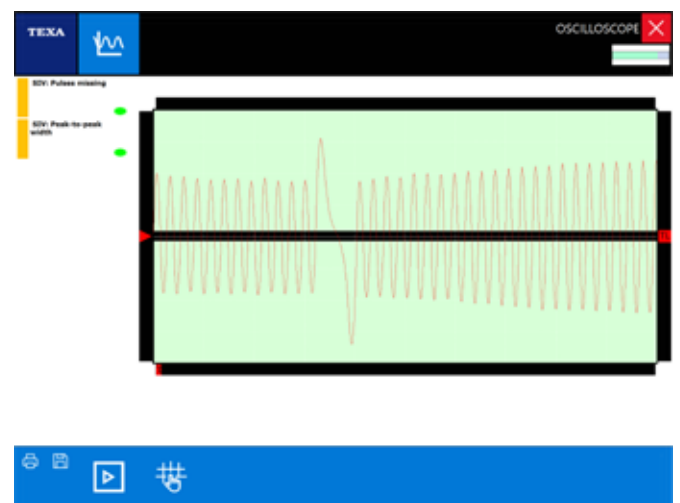

Figure 4: Crankshaft sensor oscilloscope acquisition via assisted "SIV" mode

1.4 Actuators

Unlike the sensor, which is able to produce an input signal to the control unit (information for the computer), the actuator is a device able to control and carry out a command from an electronic control unit and transform an electrical signal into a physical event.

Some examples of actuators are: the stepper motor that changes the angular position of the throttle, the solenoid valves involved in the hydraulic or pneumatic circuits and the injectors.

In this case the control unit uses the information from the various sensors and commands the actuators according to a logic defined by a series of programs (mappings) stored and determined by the manufacturer.

One of the most important actuators in an engine is the injector: a solenoid valve controlled directly by the control unit to determine the amount of fuel to be fed into the cylinder through the injection times.
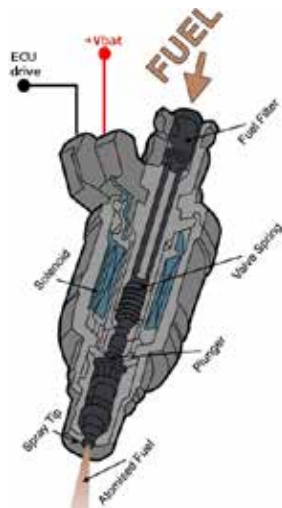
Figure 5: Injector Section

The injector is constantly powered at 12 V (A); at the time of the injection, the control unit puts an injector terminal to ground, allowing pin lifting and fuel leakage for the pre-set injection time (B). At the end of the injection, the closing of the mass command generates an extraterrestrial (C) useful for oscilloscope diagnosis on the operation of the injector.

Figure 6: Oscilloscope acquisition of the opening signal of an injector

1.5 CAN Bus: Characteristics and Advantages

CAN networks have been designed to reduce the complexity of traditional wiring by integrating a microcontroller/microprocessor-based control system that ensures flexibility, configurability and improved information security as well as speed.
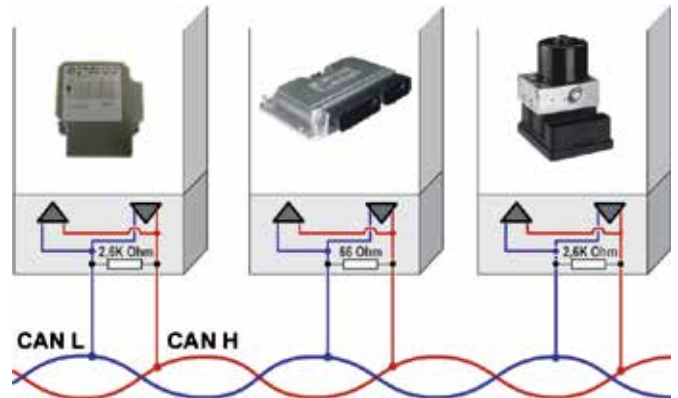
Figure 7: Example of CAN Bus connection between ECUs

The on-board control ECUs can therefore act in an interactive way: think of the power cut of the engine when the traction control is operated by the ABS, or, in the event of an accident, the Airbag unit informs the engine control unit to turn off the electric pump to stop the fuel flow.

This interactivity supposes the exchange of information between the controllers that usually occurs through an interconnection network where computers communicate digital information using various protocols, most commonly the Controller Area Network or CAN BUS.

There are several CAN architecture solutions with two-wire communication networks with a different transmission speed. The SAE (Automotive Engineer Company) has classified the various transmission standards into three main categories, based on the transmission rates and the functions implemented:

- Bodywork network (**A class**) characterized by low bit rates (up to 10 kb/s), few information and average response time: 100 ms;
- Intersystem multiplexing (**middle B**), medium bit rate (10 to 125 kb/s), average information and average response time: 10 ms;
- Medium/High bit rate (**C class**), high-bit rate (125 kb/s at 1 Mbps), much information and average response time: 5 ms.

The search for a failure should not be stopped at a single control unit, but involve the diagnosis of

several control units:
- Each control unit may carry out check actions through the information it receives from the other control units;
- The use of the CAN protocol makes it possible to simplify the electrical systems of the vehicles, making them even more reliable;
- Only a few sensors are required;
- Optional components can be installed without twisting the electrical system of the motor vehicle.
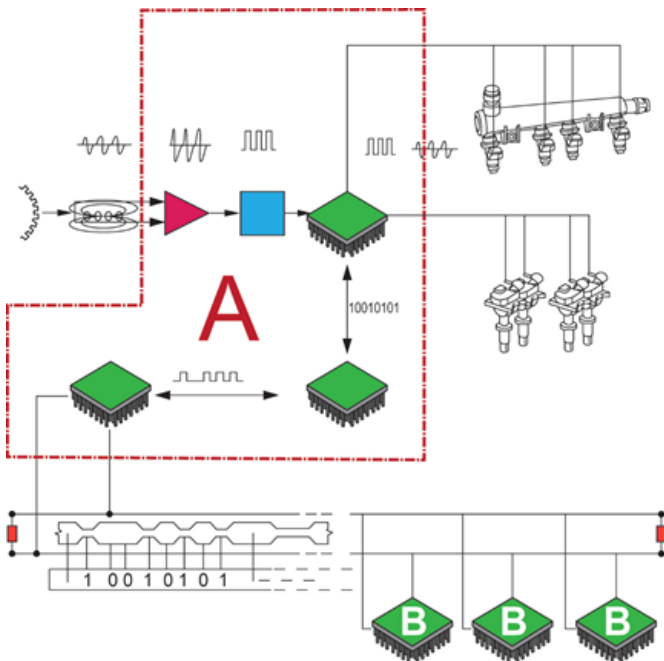
Figure 8

Training: the DIAGNOSIS of CAN-Bus NETWORKS allows you to know the operation of the main data controllers of the Controller Area Network and how to diagnose their operation.

1.6 Self-Diagnosis Limit

It is important to emphasize and remember the limits of the self-diagnosis resources. In particular, it must be borne in mind that the main job of an electronic control unit is to manage the system it is connected to (engine control, braking management, etc.) and, only later, to check and monitor the input signals and output for self-diagnosis functions.

For example, a crankshaft or camshaft sensor malfunction can lead to engine malfunctions but without leaving any trace in self-diagnosis: this is because the sensor signal check for self-diagnosis is made at a lower frequency than the one used for the management of the direct injection.

This means that a signal interruption occurring between one check and the other does not lead to the engine failure or the activation of the engine failure, even though it causes an engine malfunction. It is therefore clear that a system's diagnosis should not stop at the simple DTC reading, but it must be thoroughly analyzed by checking the parameters that the diagnostic tool provides.

It is therefore useful to take action only after a careful check of the engineering parameters and in the most complex cases to evaluate a road test with the "registration" function present in the TEXA self-diagnosis software.

The engineering parameters are the values coming from the sensors (engine temperature, air pressure, accelerator position, etc.) and those directed to the Actuators (injectors command, advances, etc.).

With the engineering parameters, the technician is able to make a critical analysis of the data managed by the control unit, but to do this the technician must have a good knowledge of the operation and the intervention strategies of the electronic system on which he must act.

1.7 On-the-Road Self- Diagnosis

Electronic systems inside the vehicles have dramatically increased in the last few years: this can obviously cause the appearance of sporadic or intermittent failures that occur only under certain driving conditions (at low temperatures, along an uphill, accelerator partial load, etc.) and that during a workshop diagnosis are not correctly detected and the vehicle is working properly.

In addition, some recent electronic systems (Start & Stop, Hybrid vehicles, assisted braking, etc.) can only be diagnosed on a vehicle in motion.

This could reproduce the conditions during which the vehicle is malfunctioning, while the "On-Board" diagnosis devices store the time sequence of all the signals handled by the control unit, including errors. After collecting the data from the vehicle, it analyzes the detected values by connecting the "On-Board" devices. It starts the stage of interpretation and investigation of the causes that generate the fault.

The new solutions for dynamic diagnosis not only improve and innovate the equipment for the workshops, but they also create a new and different work approach to the automotive technology.

Figure 9: NAVIGATOR TXB Evolution allows the recording of the diagnostic session in "Dynamic Testing" mode

1.8 The Measurement Tools

According to what has been explained so far, it is clear that the diagnosis of a system should not stop at reading errors, but it must be thoroughly analyzed by checking the parameters with the diagnostic tool. However, in certain cases in which malfunctions are out of the ECU's control, it is imperative to use the oscilloscope to analyze the signals from the individual sensors and to check the controls implemented by the control unit towards the actuators.

Figure 10

The exhaust valve that manages the throttle position, the throttle body opening command, the OCV control for engine timing management, just

to give some examples, are managed by PWM (Pulse Width Modulation) commands and for their correct evaluation of functionality an oscilloscope is required.
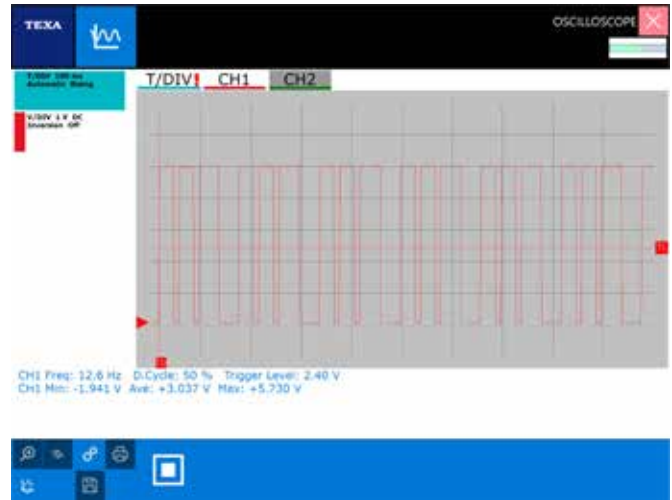
Figure 11: PWM signal

Another example may be an interruption on the signal of the throttle position sensor that creates a malfunction on the output engine's power management from the ECU.

The ECU uses a fine control of the voltage parameter of the throttle valve potentiometer for operation, while Self-diagnosis and parameter display checks the signal within a certain range of time.

In addition, for the evaluation of an efficient air mass flow, we recommend using the oscilloscope, which allows a dynamic measurement of the engine running.
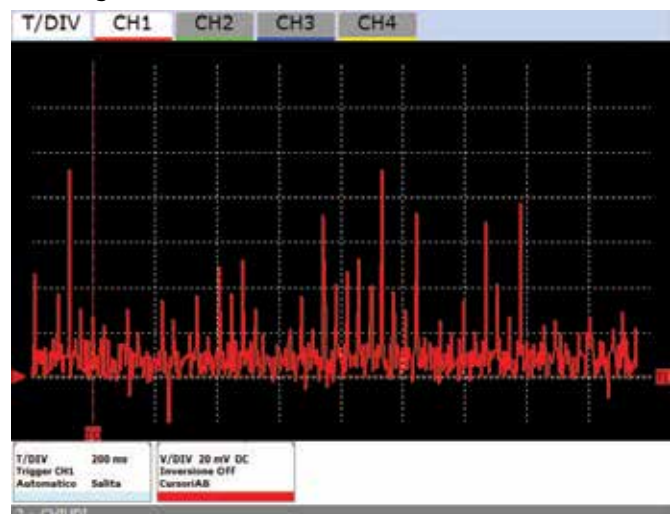
Figure 12: Example of a ground point analysis with electrical disturbances due to a bad connection

G1B

The training will allow the motorbike workshop technician to understand the electrical parameters of voltage, current and resistance using the appropriate measuring tools. The technician will also be able to analyze the electrical characteristics of the main components on motorbikes.

G3B

With this training, the motorbike workshop technician will have the opportunity to complete the training course starting with the G1B course, allowing learning to carry out a thorough diagnosis and electronic verification of the components with the measuring instrumentstools, multimeter and oscilloscope, with practical examples of how to test the main components of a motor vehicle.

1.9 The calibration of devices using the Self-Diagnosis tool

It is clear that the Self-diagnosis tool is now increasingly used just to perform all the adaptation and calibration operations required to restore the system after an ordinary or extraordinary maintenance on the vehicle.
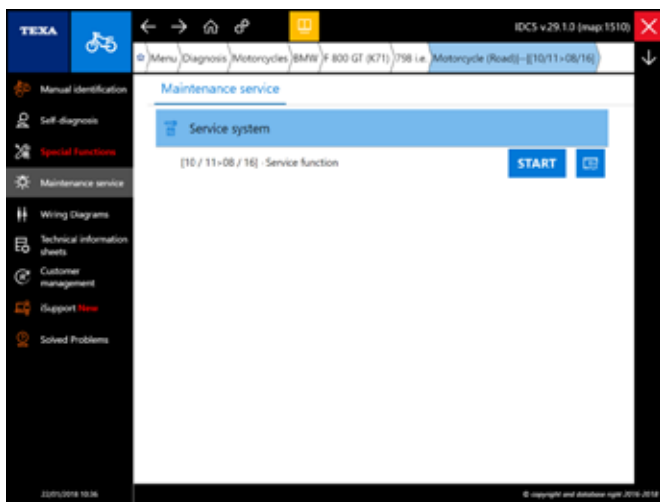

Figure 13: List of features for vehicle maintenance

For example, the technician, using the specific functions of the tool, is able to configure an ECU, code a key transponder or

set the engine idle rpm, etc. Furthermore, all the initializations can be performed, when some components/electronic

devices are replaced or disassembled and repaired, and then reinstalled, such as the EXUP valve, an accelerator

potentiometer or an accelerometer sensor, for which the control unit must learn the specific positions.

Without neglecting the function of resetting the lights after replacing, for example, of the engine oil during maintenance operations.

1.10 Diagnosis procedures and fault finding

As already mentioned, the self-diagnosis function performed by a vehicle's control unit does not always allow accurately locating the source of the failure that has caused the vehicle malfunction.

If the control unit indicates a DTC related to a passive sensor "Circuit open or circuit shorted to battery", it cannot define if the problem is the sensor itself, if there are interruptions on the wiring, oxidation in the pins or interruptions within the ECU.

In order to avoid falling into a false diagnosis, it is best to follow a precise procedure to find out the correct nature of the failure:

1. Check the stored DTCs;
2. Create a logical group of parameters associated with the detected errors;
3. If necessary, check the actuator control by means of the "active diagnosis" function (this way you can check both the component operation and the goodness of the circuit connected to it);
4. Analysis of the wiring diagram to highlight the connections between different components, powers and grounds;
5. The possible use of the oscilloscope to verify the congruity of the electrical signal generated by the sensor and also the circuit associated with it;
6. Verification of the continuity of the electrical wiring.

2. TEXA SELF-DIAGNOSIS

The TEXA self-diagnosis is composed with two devices:
- The display tool;
- The remote connection device (interface).

The first is where the diagnostic software is installed and where the user can view the information, while the second is the device that is physically connected to the vehicle to be diagnosed.
The two devices are connected to each other via a Bluetooth® wireless connection or via a common USB cable.
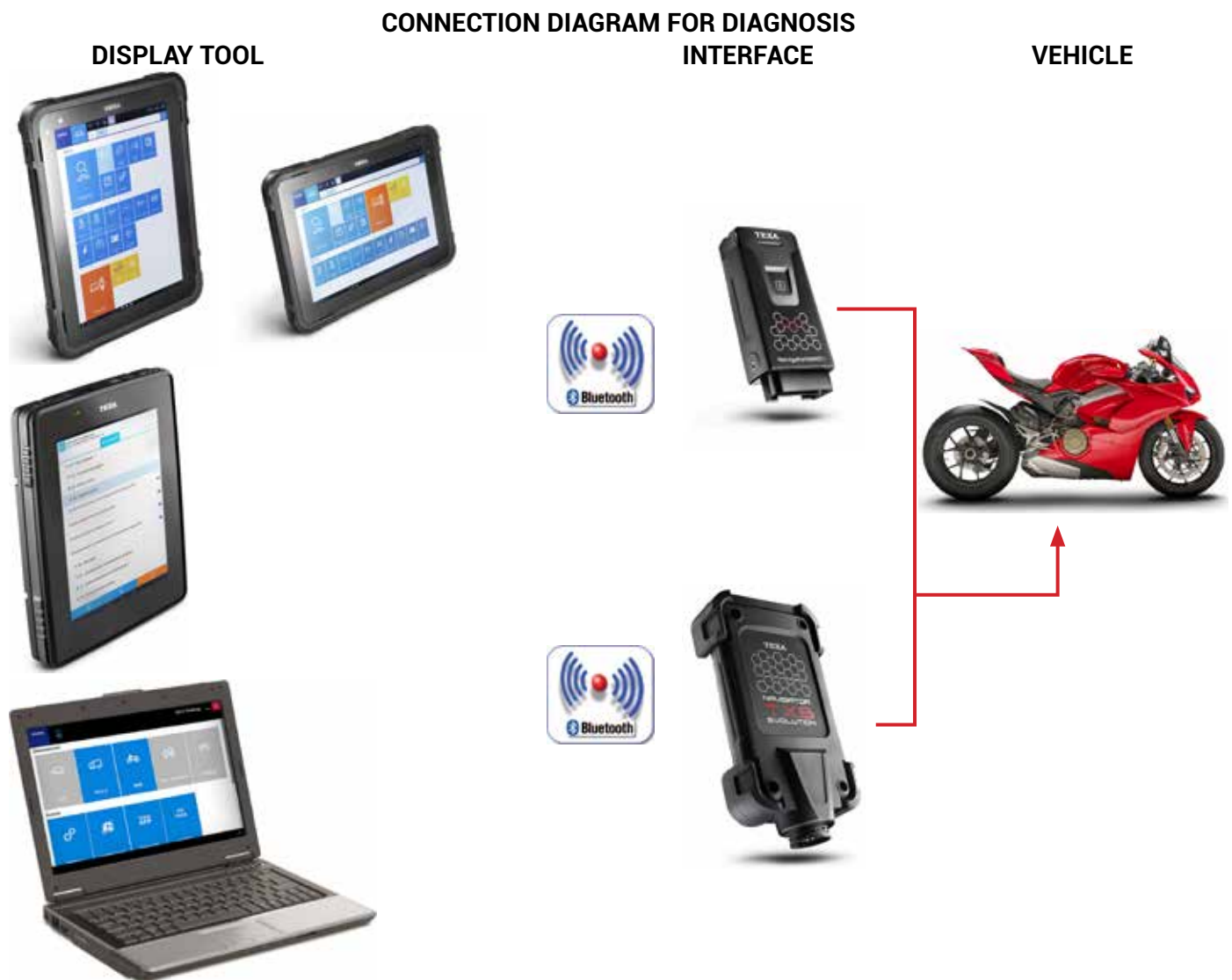
CONNECTION DIAGRAM FOR DIAGNOSIS

DISPLAY TOOL	INTERFACE	VEHICLE

Figure 14

2.1 AXONE Nemo

The new AXONE Nemo Diagnostic Device is the TEXA home flagship among the diagnostic tools.

To create AXONE Nemo, we started from our great experience as a trusted partner of tens of thousands of mechanical workshops, and we imagined what would be the evolution of their work over the next five years.

From this philosophy the first "SMART" diagnostic device was born, which is able to guarantee the technician a total flexibility of use thanks to its interchangeable modules, capable of making it suitable for multiple uses and situations.

Built according to military standards, it resists to violent falls and is designed to cope with all the disadvantages of heavy work. Unique in the world, it has the extraordinary peculiarity of being not only waterproof but also floating: a patented international innovation by TEXA.

Other features include:
- ISO TS 16949 certification, the standard required for first-class automotive suppliers.
- Magnesium shell for ruggedness, rigidity and lightness.
- 12 inch ultra-wide screen, robust thanks to Gorilla Glass specifications.
- Display either vertical or horizontal.
- Magnetic hooks for additional modules capable of extending the potential and resources to keep it ready for the needs of checking any car, even in the future.
- Conforms to military standards.
- Resolution of 216x1440 pixels.
- Quad-Core Processor.
- Wi-Fi communication systems and Bluetooth® 4.0 Low Energy.

Figure 15

2.2 AXONE 5

AXONE 5 is the new display tool that TEXA has created for all the diagnostic interventions on motorbikes and cars.

Thanks to the IDC5a PLUS software, AXONE 5 is fast and intuitive. High performance, a large screen and an ergonomic, robust and lightweight frame are the perfect synthesis for a unique product like AXONE 5. AXONE 5 is based on the operating environment IDC5a PLUS and is the evolution of the IDC5 software designed specifically for AXONE 5, in order to ensure simple and fast solutions over the software entries, intuitive commands and maximum loading speed. AXONE 5 is based on the Android operating system, commonly known for ease of use.

Figure 16

AXONE 5 technical features:
• Quad Quadcore ARM Cortex A9 processor with 2D / 3D graphics accelerator
- Quad-core ARM Cortex A9 processor with 2D / 3D graphics accelerator
- 2 GB RAM
- 64 GB solid state drive
- Android Marshmallow operating system 6.0.1
- Button with ON / OFF and RESET functions
- 9.7 inch screen, resolution of 2048x1536 pixels
- Red LED for charging indication and red / green / blue for signaling
- Speaker
- 3-axis accelerometer and gyroscope
- 3-axis magnetometer
- Dual band Wi-Fi module
- Bluetooth module
- 5-megapixel camera with flash and autofocus
- Battery life 8 hours in typical use
- External connector for power supply, battery

charger
• USB connector

2.3 Personal Computer

For maximum reliability and versatility, you can install the self-diagnosis software on a very common PC with a Windows™ operating system.

Figure 17

The advantage of the PC solution is that it can integrate TEXA's self-diagnosis software into your personal network of applications and access the new IT technologies by unlocking the software from the hardware.

2.4 Navigator TXBe Evolution

TXBe Evolution is the interface of complete self-diagnosis, which allows operation on motor vehicles (motorcycles, quads, watercraft, snowmobiles and marine engines).
It connects to all TEXA display interfaces thanks to Bluetooth® technology and to any commercial PC equipped with TEXA's
IDC operating software.

Figure 18

Thanks to Bluetooth® wireless technology, it is possible to work freely around the vehicle or comfortably seated inside it.

2.5 Navigator NANO S

Navigator NANO S is TEXA's ultimate generation vehicle interface that allows performing all the diagnostic tasks on cars, light commercial vehicles, motorcycles, scooters, quads and watercrafts.
A small, lightweight, ergonomic interface designed to work smoothly and automatically with the next-generation TEXA display interfaces such as AXONE Nemo and AXONE 5.

Figure 19

3. IDC5 INFO DATA CENTER 5

⚠️ **Navigator NANO S is TEXA's ultimate generation vehicle interface that allows performing all the diagnostic tasks on cars, light commercial vehicles, motorcycles, scooters, quads and watercrafts.**
A small, lightweight, ergonomic interface designed to work smoothly and automatically with the next-generation TEXA display interfaces such as AXONE Nemo and AXONE 5.

IDC5 (Info Data Center 5) is the new evolution of the TEXA Diagnostics Program, constantly updated and developed, integrating not only diagnosis and self-diagnosis capabilities, but the entire schema database and support documentation that the modern workshops and technicians need.

The IDC5 BIKE software is complete, practical and intuitive, very fast when communicating with motorcycles and rapid through all the phases of diagnosis, from the identification of the error to its resolution.

IDC5 BIKE is designed to accompany the mechanic from the identification of the error to its complete solution, guided, practical and safe.

Nominal values associated with the error, technical sheets, interactive wiring diagrams contain 26 years of experience and thousands of cases successfully solved.
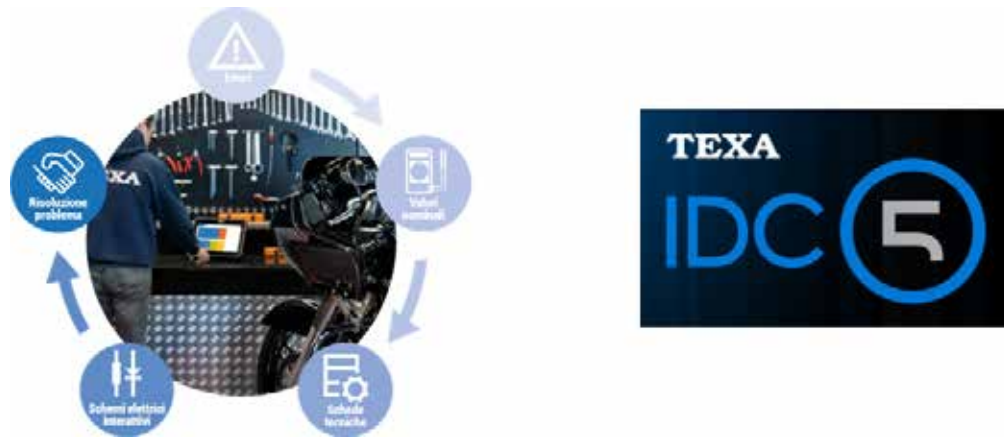

Figure 20

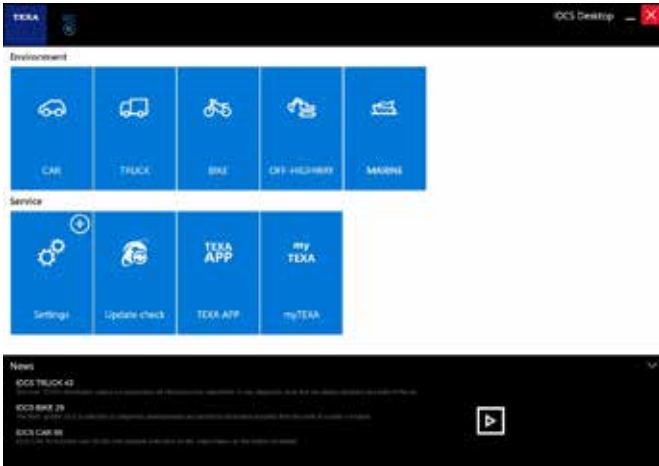*Figure 21*

3.1 IDC5 Self-Diagnosis software

Figure 22: IDC5 Desktop

TEXA IDC5 is the operating environment that combines the capabilities of the individual tools to a media support perfectly integrated in the diagnostic software.

In fact, IDC5 provides technical data and detailed information when it is needed and is constantly updated via Internet.

The self-diagnosis features have been structured and divided to facilitate the reading and the management of the maintenance operations for the vehicle being tested.

The information provided by the self-diagnosis is divided into six different working environments divided into pages:

- **FAULTS**
- **PARAMETERS**
- **STATUS**
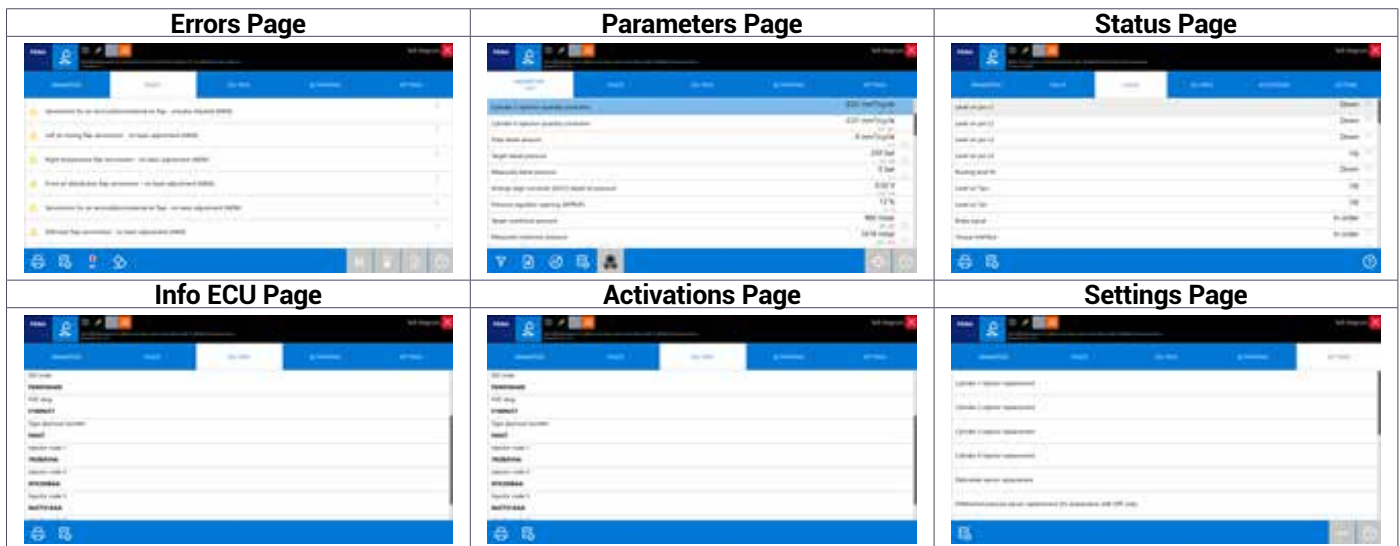- **ECU INFO**
- **ACTIVATIONS**
- **SETTINGS**

Errors Page	Parameters Page	Status Page
Info ECU Page	**Activations Page**	**Settings Page**

Figure 23

3.1.1 Activation of the diagnostic software

When the IDC5 software is started for the first time, the new installation environment must be unlocked using an activation code provided by the local dealer.
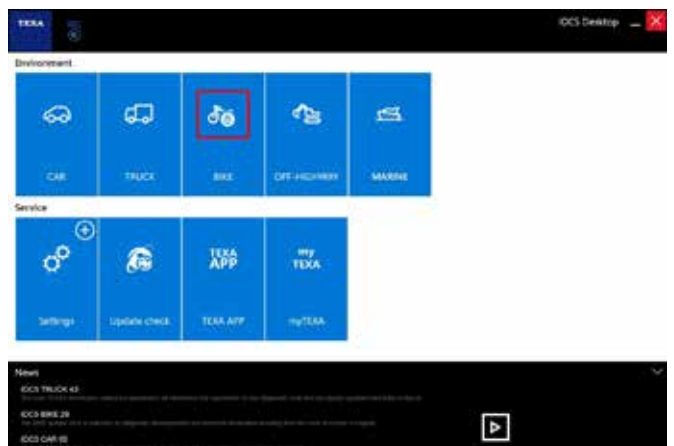

Figure 24

During the first initialization of the software, the license agreement is displayed before allowing the input of the counter code.

Figure 25: Before activating the software, the license terms are requested

Your local TEXA dealer will provide a code of 30 alphanumeric characters that must be input in the appropriate filed as indicated below.

Figure 26: First activation license screen

By inserting the counter code and pressing the "Manual activation" button, the software will then be activated in all its functions.

3.1.2 Navigator TXB, firmware update

The firmware update of the TXBs tool takes place automatically, just before communicating with the control unit.
If TEXA releases new updates available for the tool, the procedure will be as follows:
After connecting the TXBs tool to the diagnostic socket of the motorbike by means of a special cable (indicated in the appropriate window, based on the selection made), press the CONFIRM button.

Figure 27: Warning screen when the Navigator interface's firmware needs to be updated

A pop-up related to the new update will be displayed automatically, and then by following the simple indications on the screen you can complete the operation:
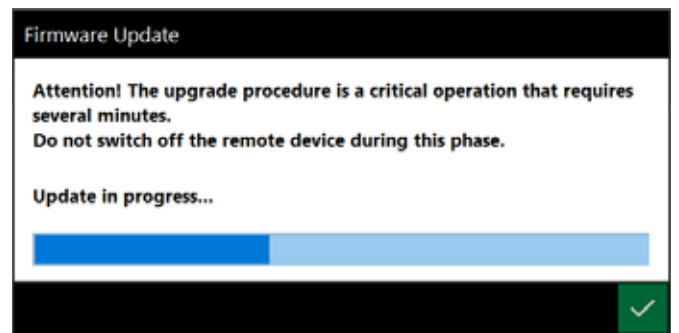

Figure 28: Warning: the firmware update is a critical operation: at this stage the Navigator must have a stable power supply (> 12.5 V)
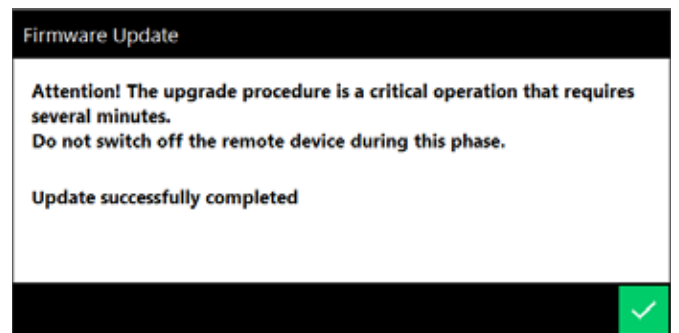

Figure 29: Update successfully completed

At this point, press OK. The updated tool will restart automatically and be ready for use.

3.2 The evolution of diagnostic systems

The evolution of electronic management systems has led to a consequent evolution of the diagnostic methods.

The first diagnostic mode implemented in the control units was the process called BLINK-CODE in which, through a flashing code emitted by the control unit and typically visualized by the engine failure indicator, the technician could have a first diagnosis feedback.

This type of diagnosis, although not very professional, has been used by Japanese companies for a very long time.

An evolution of the self-diagnostic systems was the diagnosis by SLOW-CODE introduced by BMW in 1983 for which the diagnosis is possible only through a tool that requires the control unit to switch to self-diagnostic mode with the emission of fault codes directly to the diagnostic tool that reads them and provides the related information.

In 1999, with BMW, the **SELF-DIAGNOSIS MODE** was introduced also for motorbikes.

This mode is not limited to reading DTCs but allows, through the two-way communication between the tool and the control unit, the continuous monitoring of all the signals coming from the system that the control unit manages.

3.2.1 Blink-Code diagnosis

TEXA's self-diagnostic resources make it possible to transmit this code to the control unit by means of a specific diagnostic socket and, once issued, to interpret it.

Below this type of approach is explained in detail: let us analyze the specific case of a Kawasaki ZX 6 RR.
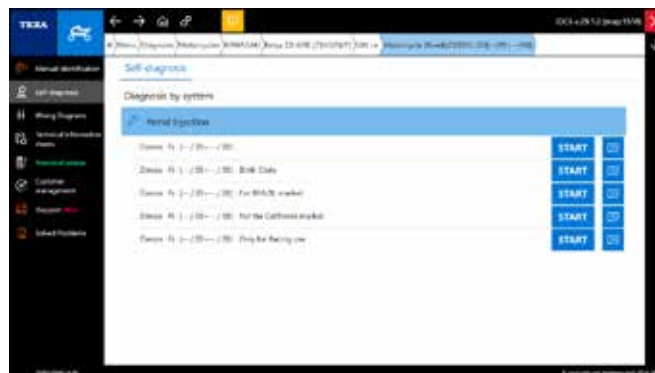

Figure 30: Motorbike selection

Figure 31: List of diagnostic variants, in our case we choose "Blink-Code"
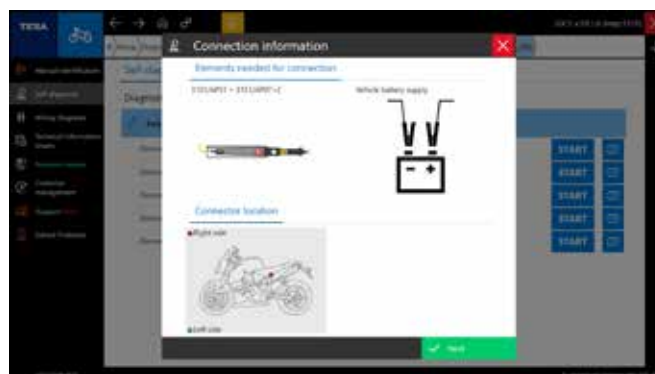

Figure 32: Description of the connection cable

Figure 33: List of available operations

After selecting the vehicle and the diagnostic mode, the tool guides the technician though the various stages of diagnosis with messages:

Figure 34: FI light for reading procedure

The first message states the methods for detecting and signaling the presence of an error by the self-diagnosis of the control unit.

Figure 35: Indications on the connection of the tool

The second message gives information on which cable to use and how to connect the diagnostic tool.

Figure 36: Help message on how to read errors

Once the fault code has been detected, it is possible to know its meaning by typing it in the diagnostic tool.

Figure 37: Information on the detected code

The tool then asks if you want to clear the related DTC.

3.2.2 Slow-Code diagnosis

The Slow-Code diagnosis that can be carried out on BMW motorbikes gives the possibility to detect and perform the INJECTION and ABS system DTC clearing. Regarding the injection:
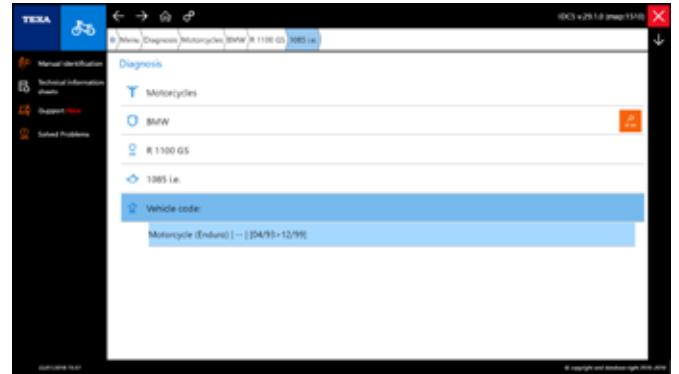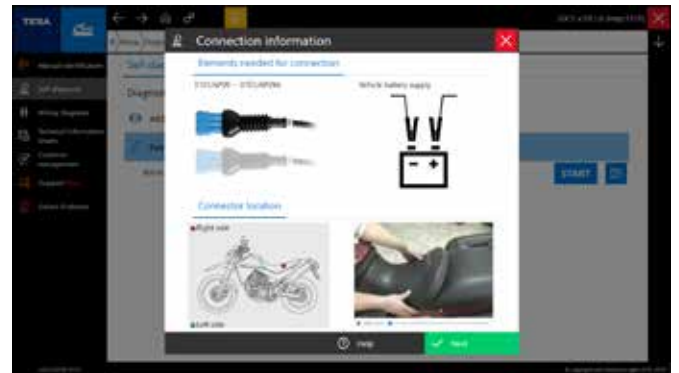

Figure 38

Figure 39: BMW Slow-code diagnosis sequence

After the selecting the vehicle and the specific system cable that must be used for the specific socket, follow the instructions on the screen to start the diagnosis after selecting the operating environment ERRORS or ACTIVATIONS.

Figure 40: The IDC5 software before the actual diagnostic phase may require special conditions: in this case you will be required to place the bike on its center stand

Figure 41: Connect the tool to the diagnostic socket

Figure 42: Switch ON the ignition without starting the engine

Usually on this specific bike, the following DTCs are always detected in the injection diagnosis:

Figure 43: The error page always indicates the missing signal to the HALL sensors

The explanation of the errors on the Hall sensors for this BMW engine is provided by a special bulletin:
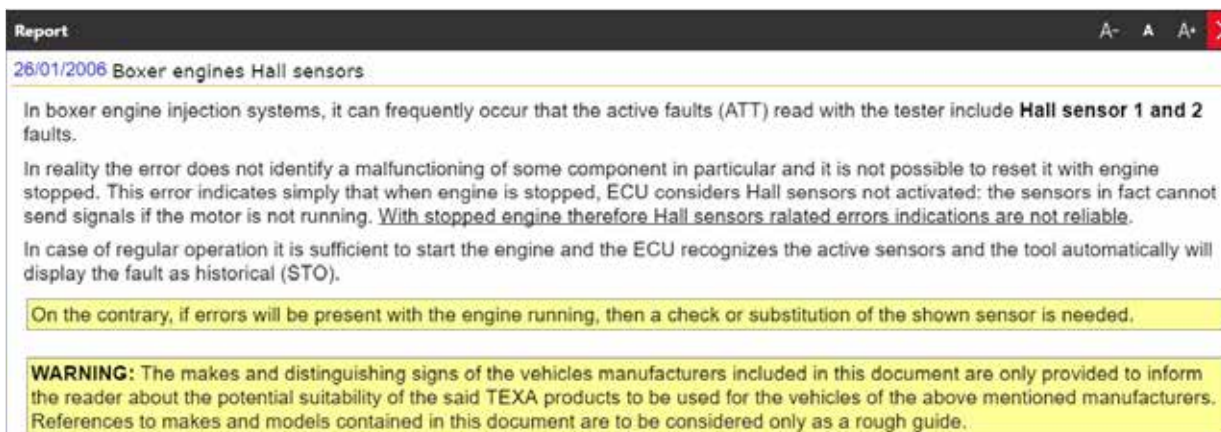

Report

26/01/2006 Boxer engines Hall sensors

In boxer engine injection systems, it can frequently occur that the active faults (ATT) read with the tester include **Hall sensor 1 and 2** faults.

In reality the error does not identify a malfunctioning of some component in particular and it is not possible to reset it with engine stopped. This error indicates simply that when engine is stopped, ECU considers Hall sensors not activated: the sensors in fact cannot send signals if the motor is not running. With stopped engine therefore Hall sensors rlated errors indications are not reliable.

In case of regular operation it is sufficient to start the engine and the ECU recognizes the active sensors and the tool automatically will display the fault as historical (STO).

On the contrary, if errors will be present with the engine running, then a check or substitution of the shown sensor is needed.

WARNING: The makes and distinguishing signs of the vehicles manufacturers included in this document are only provided to inform the reader about the potential suitability of the said TEXA products to be used for the vehicles of the above mentioned manufacturers. References to makes and models contained in this document are to be considered only as a rough guide.

Figure 44: Bulletin available in IDC5 explains the peculiarity of this system diagnosis: the DTC needs to be considered not real if the engine starts

3.3 Vehicle selection

This function allows selecting the vehicle on which you need to operate and access all the diagnostic functions.

The selection is made by choosing among the items proposed in the drop-down menus of the fields:
- **Category**
- **Make**
- **Model/Engine Type/Vehicle Code**
- **Year of validity**

These fields are different selection levels.
In order to move from one selection level to the next, you need to have completed the selection level in which you are located.
The selection is complete when an item has been selected for each of the proposed levels.
At the end of the selection, the software shows a specific menu for the selected vehicle.
This menu shows the tests that can be performed on the vehicle. The Vehicle Selection screen is the first that the software displays at startup.
Alternatively, you can start it from the Home screen.

Figure 45: The IDC5 home screen is located by pressing the top home button

Proceed as follows:

1. Press

2. Select the Category;
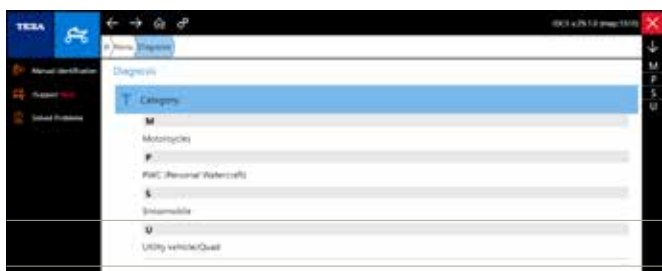
Figure 46: Category Selection

3. Select the Manufacturer:
   The makes, the models and the engines code are in alphanumerical order
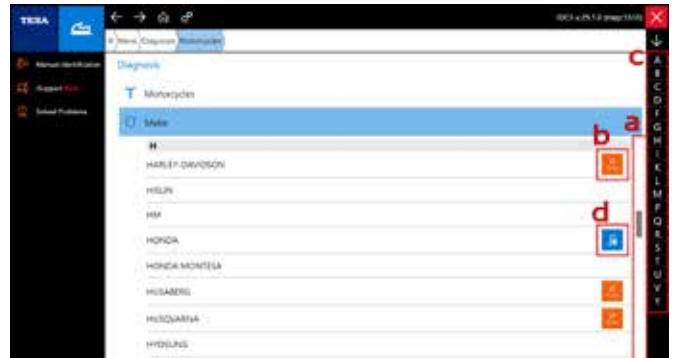
Figure 47: Manufacturer Selection

To quickly access the selection items level you can:
   a. Use the vertical scroll bar;
   b. From the Make selection level, select the Scan VIN 2.0 function (only for compatible makes);
   c. Press directly on your keyboard the letter corresponding to the initial of the desired make/model/engine;
   d. Press on the letter corresponding to the initial of the desired make/model/engine in the list on the right side of the screen;
   e. From the Brand selection level, start the Quick Diagnosis function (only for compatible makes).

4. Select the **model/engine/vehicle code**
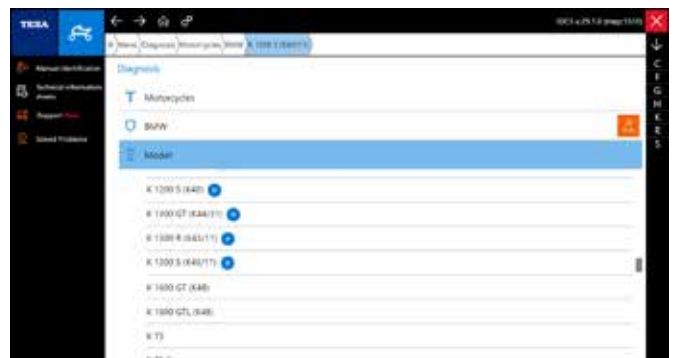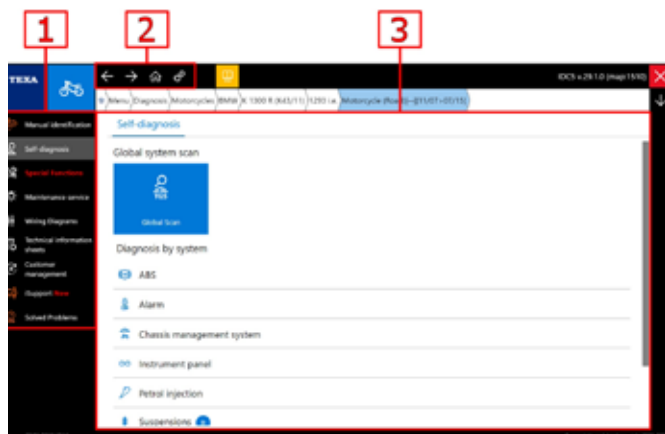
Figure 48: Engine selection

Figure 49: Vehicle selected MENU

The screen of the selected vehicle is divided into three sections:
1. Side Menu: here you can select all the functions available for this vehicle;
2. Summary Bar, useful to return to the previous MENU;
3. Selection of the specific diagnostic system.

> ℹ️ *The functions available in this screen depend on the selection made.*

3.3.1 Manual Vehicle Identification

It is the technician's duty to correctly identify the model and the system version that needs to be checked, starting from the vehicle documentation (registration certificate, user and guide manual, etc.). Often the vehicles that require a Self-diagnosis check are already known, but sometimes they are "uncommon". For this reason, TEXA has increased the vehicle search possibilities through a special function called: **Manual Identification**.
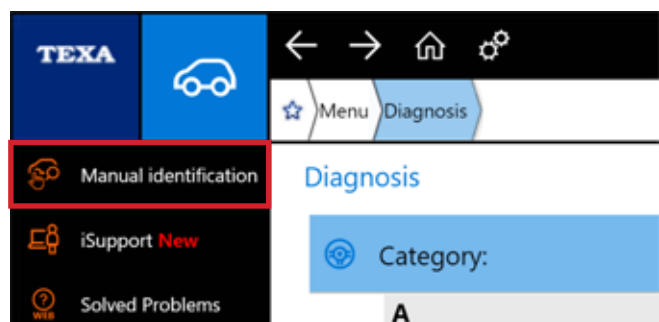
Figure 50: Manual Identification Button

This function allows performing a vehicle search based on 2 different variants:
• VIN search;

• Registration Number search (this must be previously saved in the customer management system)
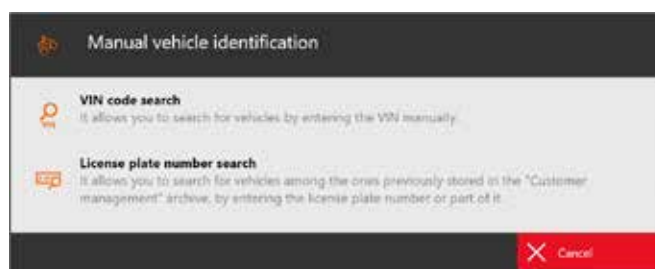
Figure 51: The 2 selection options available

1. Enter the chassis number manually and proceed identifying the vehicle;
2. The vehicle license plate number search, on the other hand, allows searching for the vehicle only among those registered in the customer management database.
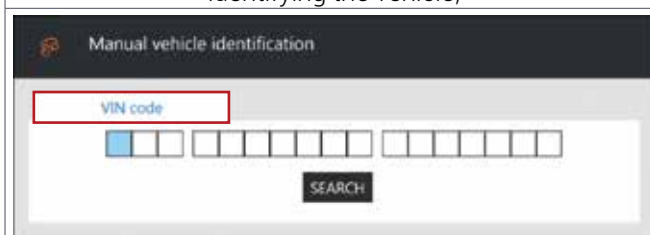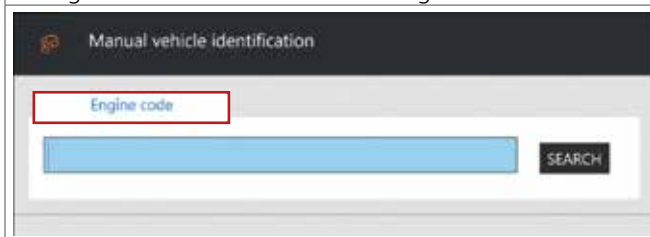
3.3.2 Automatic vehicle selection

To make the correct selection of the vehicle simple, from the "Make" selection level of IDC5 it is possible to start the **SCAN VIN 2.0** function that allows to automatically retrieve the VIN stored in the control units. When using this function, always make sure that the ignition is switched ON.
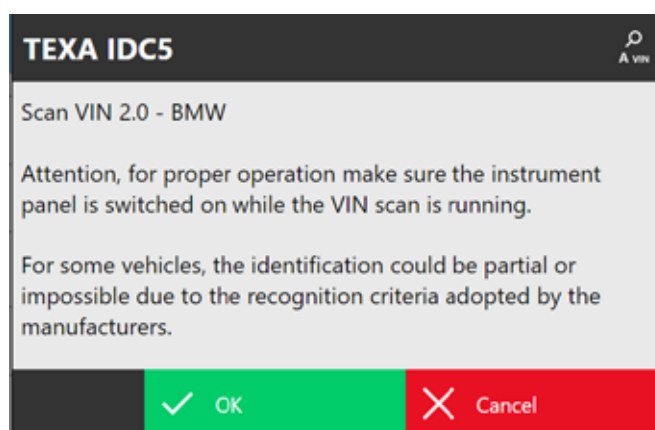

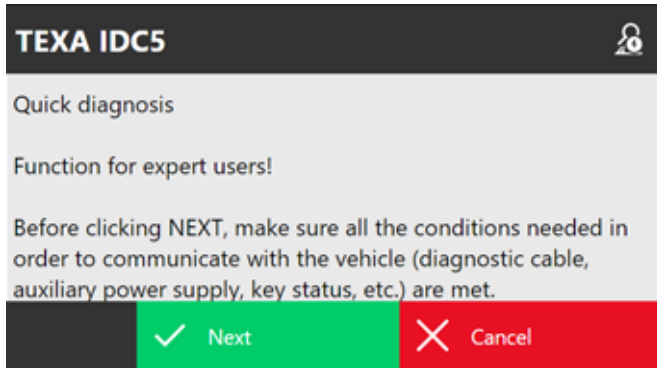Figure 52: Message displayed before performing the Scan VIN

Figure 53: Quick diagnosis menu

Moreover, the selection through the "QUICK DIAGNOSIS" allows reaching the interested vehicle in a few clicks. Simply click on the function button located near the make and connect the diagnostic tool to the vehicle. The software will directly access the injection system or perform a scan reporting the systems available, with the possibility of specific diagnosis.

3.4 🔒 The Global Scan function

The Global Scan function is the evolution of TEXA's system scanning functionality and allows obtaining a list of the systems available on the motorbike, selecting the desired systems and performing a scan to obtain the status (detected errors, etc.) of the control units.
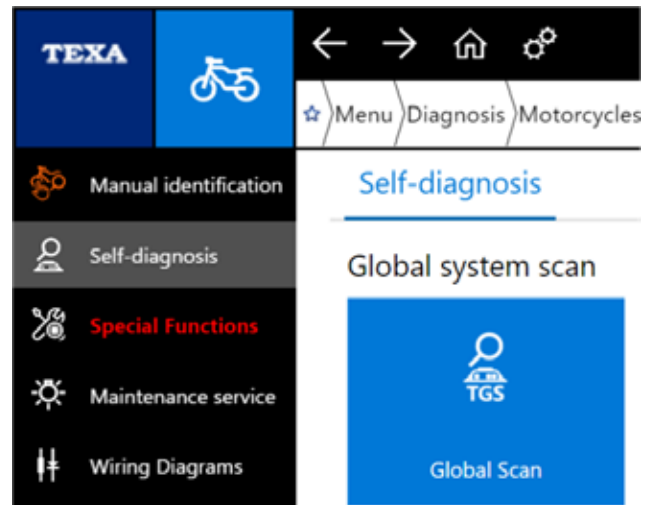
Figure 54

After selecting the vehicle to be diagnosed, the function can be accessed.

Figure 55: Global Scan on Ducati motorbike

After a few seconds (the time is determined by the quantity of ECUs present), you can view a report that presents a list of the control units present, which of these have errors in the memory and in what condition they are: present or stored.

At the end of the operation, the operator can also print the result of the scan to deliver it to the customer with all the errors detected.

Figure 56: When scanning the Ducati control units, you can also view other data such as the VIN, software version and different configuration

In this page it is possible to see the complete list of the control units (B) available and in correspondence of each one the presence of a dot (A) that remembers the response of the control unit and the status of the errors in the memory. The example shows the scan on a Ducati motorcycle in which there are several other columns that complete the information on the system. Please note that this information may vary and depend on the manufacturer, the model and the preparation of the bike.

3.5 ⚠ Faults Page

Each diagnosis should begin with the acquisition and identification of errors stored in the electronic control unit of the vehicle.

> ℹ *In IDC5 the flashing "Tab" is informing the user that the ECU has one or more DTCs stored.*
>
> **FAULTS**

The DTCs displayed by the self-diagnosis can be divided into 3 types:

- ⚠ **ATT (Active)**: This type of DTC it is currently present into the system, detected and saved by the ECU;
- ⚠ **MEM (Stored)**: The DTC has been detected by the ECU but currently it is not present, however the DTC is still stored in the ECU DTCs memory;
- ⚠ **STO (Historic)**: The DTC is no longer present in the memory of the electronic control unit, but is stored as a historical error in the memory of the diagnostic tool (this type of DTC automatically disappears at the end of the diagnostic connection).

> ℹ *Stored DTCs*
>
> *While active or historical errors do not require additional explanation, a special note is necessary for the stored failures.*
>
> *In fact, an error can assume the stored state for 3 distinct reasons:*
>
> 1. *It is a failure that occurred long ago, so the failure was repaired, but the ECU memory was not deleted. The system keeps the error stored only as a past reference.*
>
> 2. *Some types of errors cannot be deleted for legal reasons (e.g. issues regarding the emission of pollutants from Euro4 or higher vehicles). If the failure has been solved, this error may remain in the memory to make law enforcement control of the "history" possible. The clearing in this case only comes after a series of trips (from 1 to 3 trips) where the control unit recognizes the deletion of the failure.*
>
> 3. *The vehicle has a failure, but this only occurs in special conditions of use. In this case the error switches to the active state (ATT) only when the conditions are met, for example only when the vehicle is in motion and the engine is hot.*
>
> *It is easy to understand that the 3rd case is the most interesting one for technicians.*
>
> *In fact, there is a whole series of failures that can occur only in particular conditions of use of the motorbike.*
>
> *An example on an ABS braking system are the wheel speed sensors, but not when the problem refers to the sensor itself (coil or magnet issue), or to its electrical wiring (short circuit or open circuit), when the problem is due to the phonic wheel or to the air gap (distance of the sensor from the phonic wheel).*
>
> *In fact, the vehicle fault condition (workshop condition) will always be in the stored state (MEM), as the control unit can check the quality of the signal from the wheel sensors only when the wheels are moving beyond a certain speed threshold.*
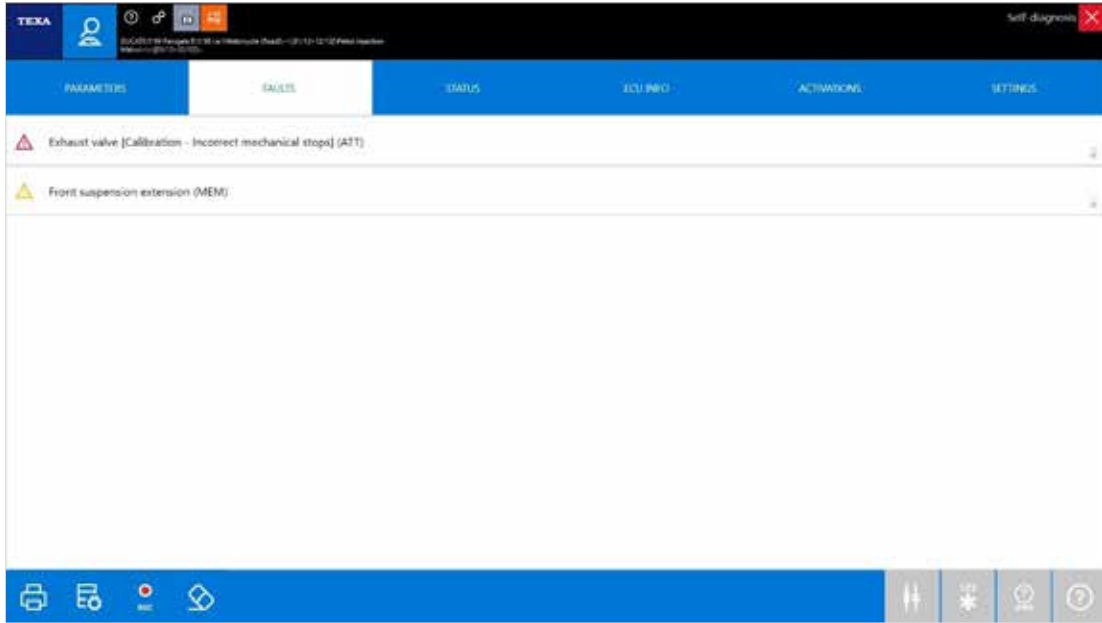
Figure 57: DTCs available in the ECU

> ℹ️ *The meanings of the above abbreviations must be considered only as a general rule; In fact, there may be exceptions. For example, in some electronic systems, the storage of DTCs is not classified between the ATT and MEM status.*

By selecting a specific error, you can get information about the displayed error.
Clicking twice on the error will give you more detailed information about the recorded error.
The errors can be cleared by clicking on the "FAULT DELETE" icon.

Figure 58: Identification Icon related to the DTC clearing

3.5.1 DTC Detail and Code

By double-clicking on the description of a DTC, you will see a detail of the fault itself. The level of detail depends on the programming of the electronic control unit and may include an error specification and the manufacturer's original error code.

Figure 59: The DTC detail is always available by double clicking. In this case the error code P1007 indicates that the exhaust valve has a mechanical problem in the rest position

3.5.2 Fault Page, further information

The triangle icon next to the description of the DTC indicates the state of the error itself, while the availability of additional information may be inferred from the presence of some symbols on the right of the error that enable their command buttons.

Figure 60

ICON	NAME	DESCRIPTION
⑦	DTC Help	Explanation of the error with the possibility of troubleshooting.
123 ✳	Freeze Frame	Operation Parameters saved when the fault occurred.
⊹	Component location	Location of the component in the wiring diagram.
⑦ WEB	Solved Problems Database	Fault Finding through the TEXA workshop customer database.

Table 1

3.5.3 ⑦ DTC Help

Each fault message, when possible, is accompanied by an error "Help" that includes a series of information and explanations of the DTC itself. When available, by selecting the error, the button is enabled.
The help contents can offer a series of useful information to better understand the meaning of the error message and, possibly, a first set of checks to be performed.

3.5.4 ✳ Freeze Frame

The continuous technological development brings new features and new possibilities in the field of self-diagnosis also.
The Freeze Frame function is like a "screenshot" of a number of engine parameters taken when a fault occurs, especially for random issues.
This way it is possible to learn the causes of the issue in detail.
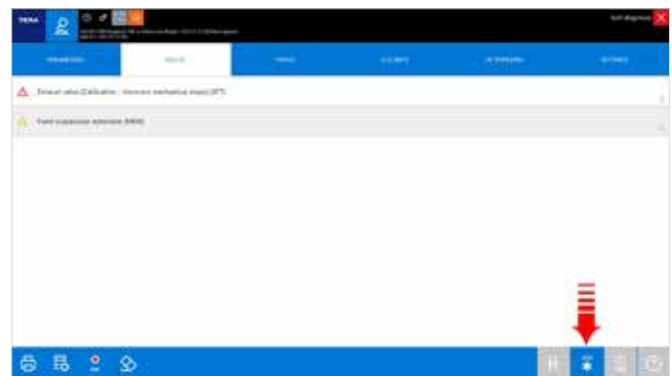
Figure 61: Freeze frame function button location

> **i** *The detail of the information contained in the Freeze Frame depends on the manufacturer and can vary greatly depending on the type of diagnosed system.*
> *It is not TEXA that has developed this kind of technology, but it is a feature of the new generation of electronic control units.*

Figure 62: Table of parameters recorded when the error occurred

3.5.5 ⊞ Component Location in TEXA Wiring Diagrams

Many DTCs that can be found in the control unit are related to specific components (faulty pressure sensor, temperature probe shut off, solenoid valve or short-acting actuator, etc.).

When you already know the vehicle or system to be diagnosed, the location and type of connection of the failed component are already known. However, in many other cases, it is useful to know which is the device listed and where it is. In fact, manufacturers often use different denominations to identify the same component (e.g. the block of motors that handle the air passage in the air conditioning system can be called "Flap Motor" or "Stepper motor" depending on the manufacturer of the vehicle).

Therefore, for those installations where a wiring diagram is available and for those errors associated with a specific component, the "Component Location" button will display the associated device on the circuit diagram.
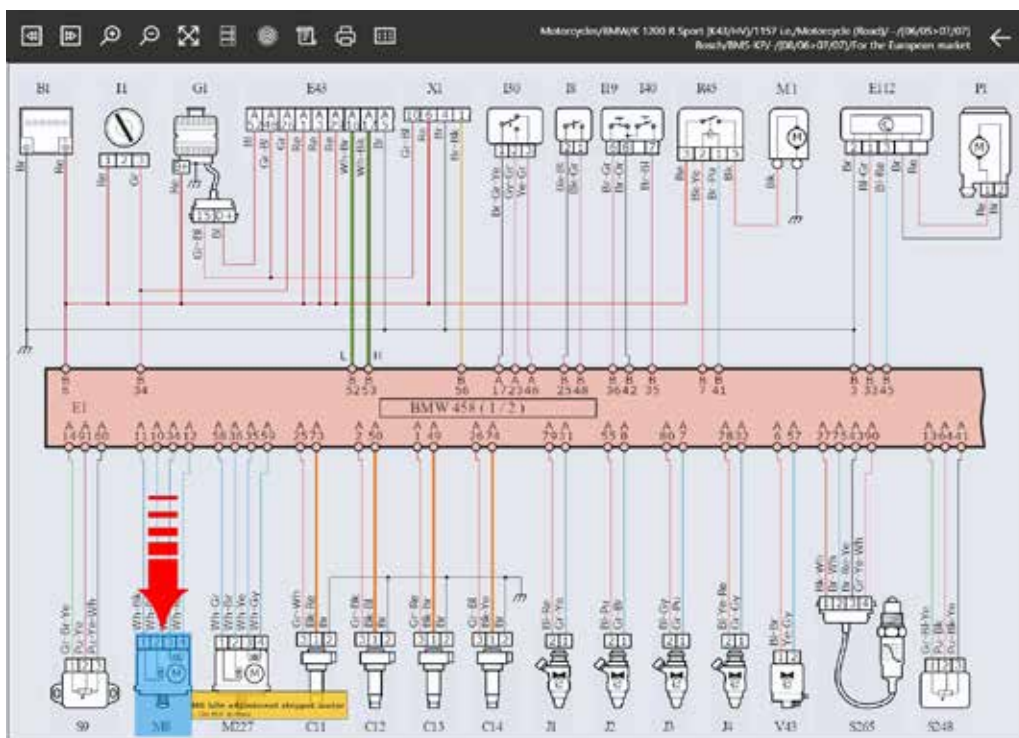
Figure 63: In the wiring diagram, the component linked to the selected DTC will be highlighted

3.6 Parameters Page

Another important feature of the self-diagnosis is to display the system parameters, such as sensors and actuators, ensuring that the car-repairer understands if the test component is working properly.

The TEXA diagnosis allows reading the parameters through the dedicated function.

The displayed parameters are proposed almost in real time with a delay due to the speed of the serial line and the calculation power of the control unit.

Remember that the control units have the priority to manage the system and, just as a secondary activity to communicate this information to the diagnostic tool.

The parameter reading depends on the type of electronic control unit being tested: older power supplies have a longer data upgrade delay.

The user can activate or deactivate the initial parameters by selecting the most interesting ones for the diagnosis that is being performed up to a maximum of 8 at the same time. We recommend verifying that the update of the various parameters matches the actual change in the working condition of the observed component.
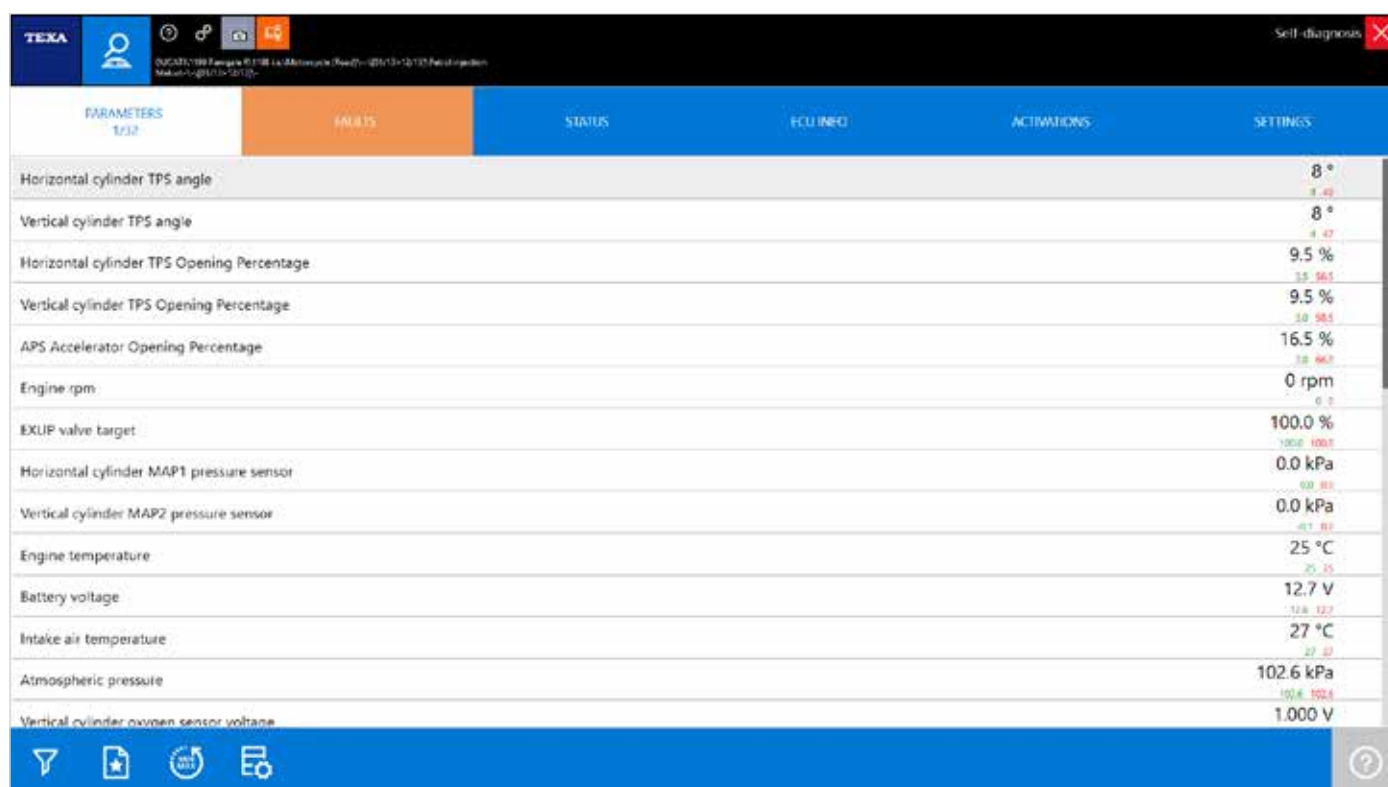
Figure 64: The number of parameters that can be displayed on the page depends exclusively on the manufacturer and on the control unit selected

The most recent versions of control units allow a very thorough diagnosis with a considerable number of parameters available during the diagnosis, which however can make the parameters search difficult and not fast.

To overcome this problem, TEXA has created a new parameter search feature that makes the parameters search easier and faster.

This function is selectable using the following button:
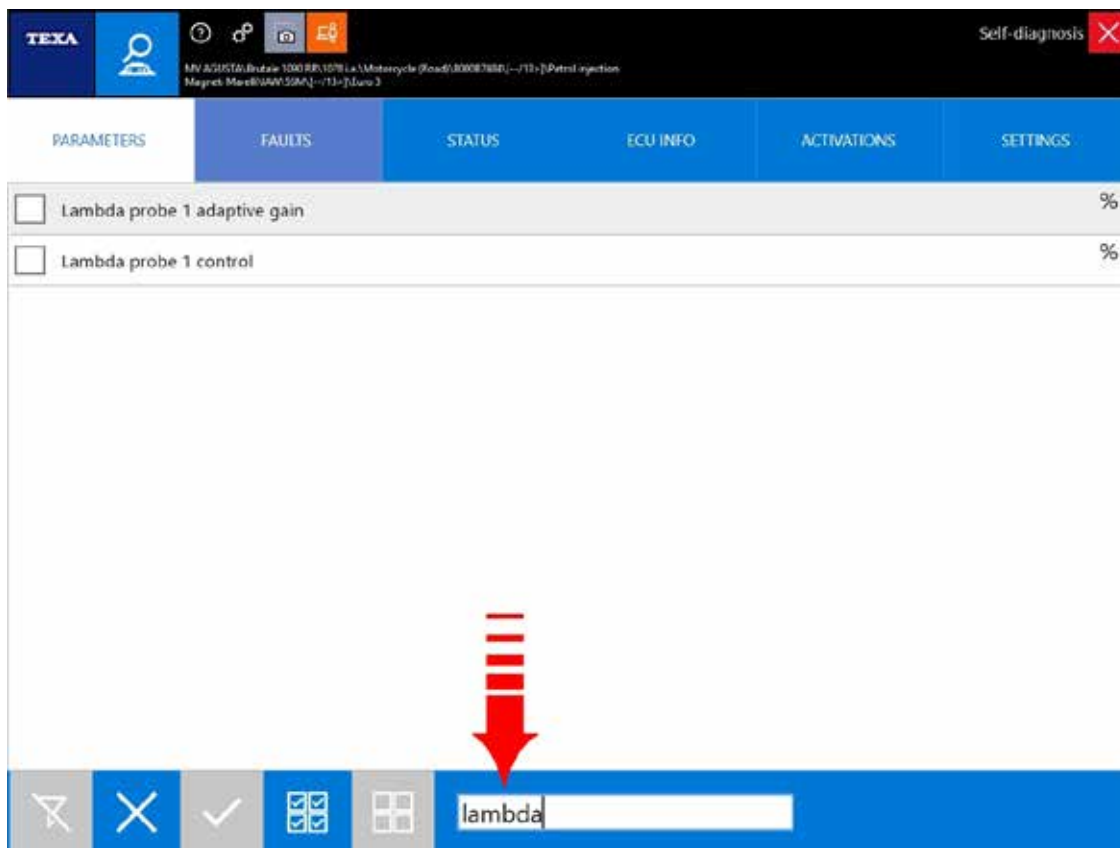
Figure 65: By typing in the highlighted line the keyword of the parameter to search for automatically, the list of parameters matched to that term will be displayed
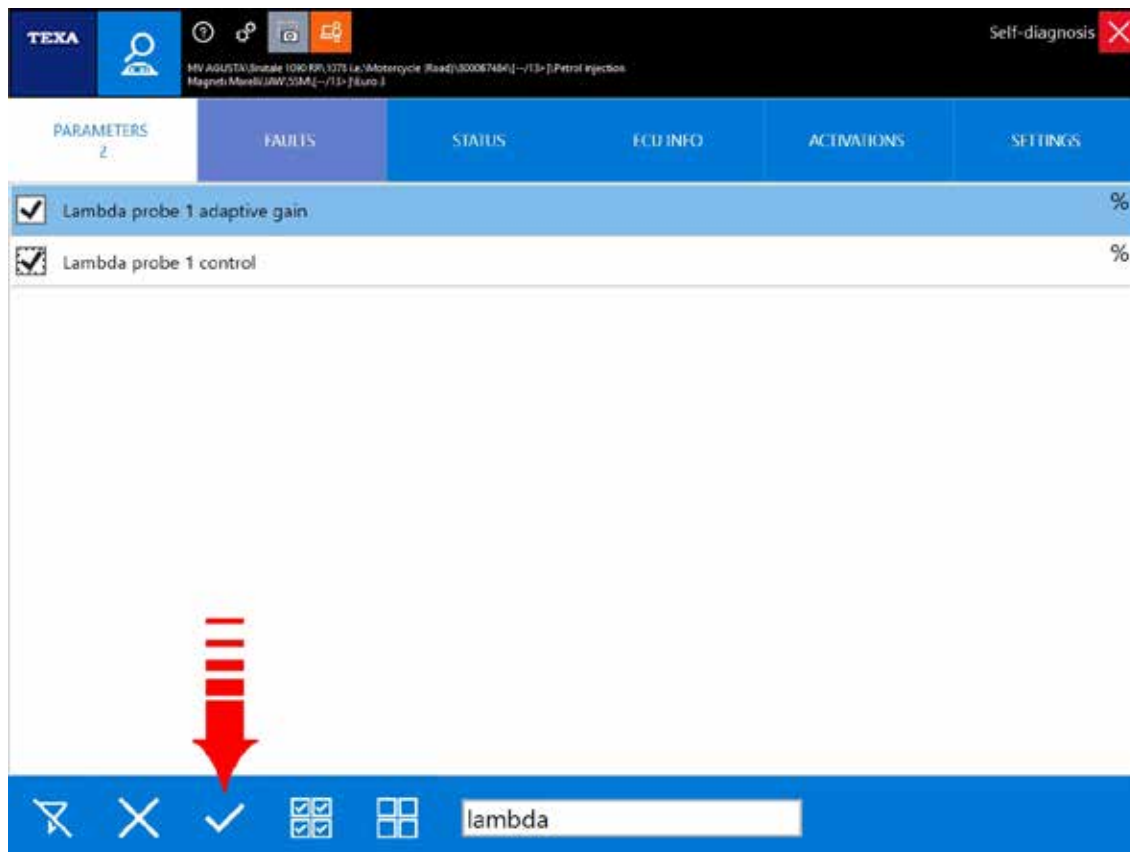

Figure 66: Once the parameters have been selected, the selection can be checked using the highlighted button

3.6.1 Logical Group, Parameters

Making a list of parameters according to a logical group means to let the Self-diagnosis tool display a number of selected parameters that are only relevant for the check on a specific system.
For the logical group to make sense:
- the operator must know the system which requires a check;
- all the selected parameters must relate to the component or part of the system that must be checked;
- the operator must not select too many parameters at the same time to avoid slowing down the update of the selected data (Refresh): the ideal number is 4 at a time.

3.6.2 🔖 Favorite Group

This function allows viewing and managing the favorite parameter groups created through the Parameters function. Favorites are organized in pages as diagnosis functions. Each new favorite group will be displayed on a new page, which can be selected simply by pressing the related label.

Proceed as follows:

1. Press
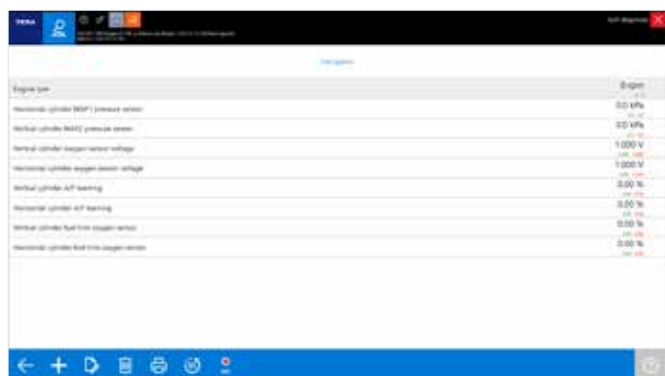
Figure 67
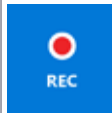
ICON	NAME	DESCRIPTION
➕	Create a Group	Allows to createcreating a new FavouriteFavorite Parameters Group
📝	Edit a Group	Allows editing the Favorite Parameters Group by adding or deleting some of them
🗑	Delete a Group	Allows deleting a Favorite Parameters Group
🖨	Printing	Allow printing a report in which the parameter values are saved
MIN MAX	Reset Min Max	Allows resetting the max and min values of the displayed parameters
REC	Recording	Allows recording the parameter values of the selected favorite ones. The Recording is saved in the Customer Management Database.
/i\	On-the-road test/Dynamic Test	Allows configuring the Self- Diagnosis Tool for the recording function of the parameters and the DTCs detected by the ECUs with the vehicle on the road.
❓	Information	Allows viewing a Help screen related to the selected parameter

Table 2

A. Group creation
   Proceed as follows
   a. Press ➕
   b. Select the desired parameters

Figure 68: From the complete list of parameters you can select only those needed to create the logical group

c. Write the name of the group in the specific space
d. Press ✓: the group is now created.

3.6.3 🔲 "Dynamic tests" function

Thanks to the new high-performance hardware installed on Navigator TXB Evolution it is possible to record the diagnostic session in "Dynamic Testing" mode, i.e. with a the vehicle moving, in order to identify specific problems that would otherwise not be found in the workshop. The best advantage is the recording of parameter without the need for a connection between the TXTs and the display unit (computers or TEXA tools). Once the interface has been programmed, it records a complete overview of the conditions in which the fault occurred, providing important analysis elements to identify the causes of the fault and carry out the repair after the vehicle is back in the workshop.
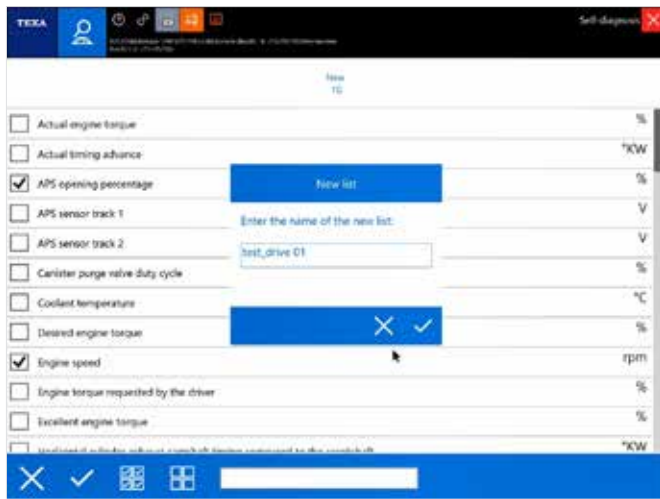
Figure 69: To perform a road recording it must starts from the preferred parameters choice

In order to have a good recording we recommend selecting a logical group not above 20 parameters to maintain a sampling time of the sampled data very close to the real time of the engine parameters.
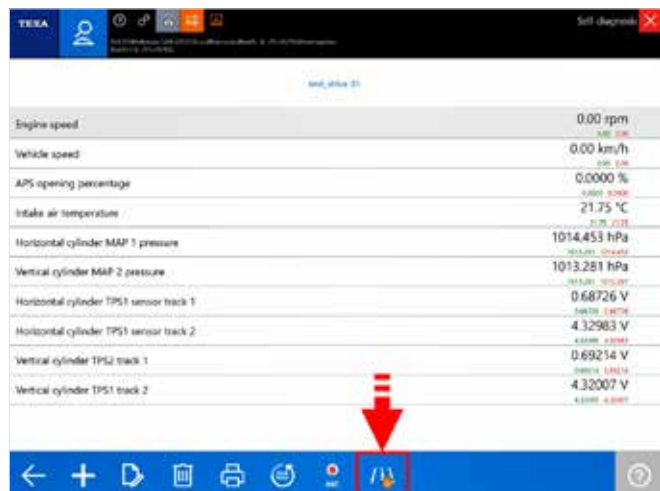

Figure 70: By selecting the highlighted button, the procedure for dynamic diagnosis will be launched

Figure 71: By confirming with the button on the bottom right, the diagnosis of the chosen group of favorites will be installed in the TXTs

Figure 72: By confirming with the button on the bottom right, the diagnosis of the chosen group of favorites will be installed in the TXTs

Figure 73: The TXB Evolution configuration completed successfully

Once the interface has been configured, it will emit a beep at regular intervals: this means that it is in acquisition mode and each time the key is on ON, it will start saving the selected diagnostic data autonomously.

At the first diagnostic connection between the IDC5 software and the interface, you will be asked to download the data recorded up to that point.

The downloaded data can be easily found in the "Customer management" section, which can be reached from the main menu and from the vehicle selection menu (see figure below).
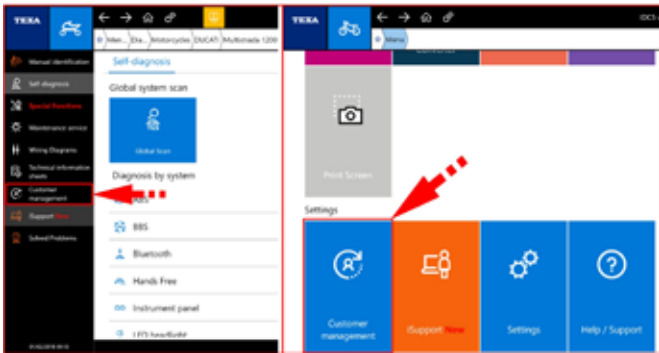
Figure 74: The customer management menu is located in the left-hand bar in the vehicle selection (left figure), or in the main menu of the CAR home section (figure on the right)
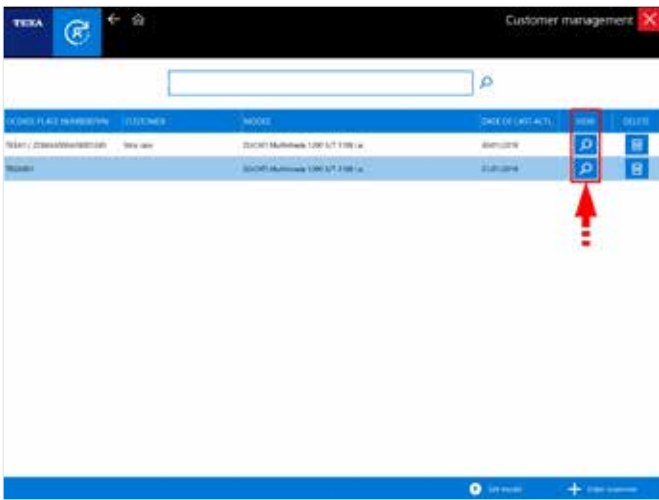
Figure 75: The main screen of the customer management allows selection the reg. number

Using the view button (red arrow in the previous figure) you can select the desired plate and then the trips divided according to date and time.
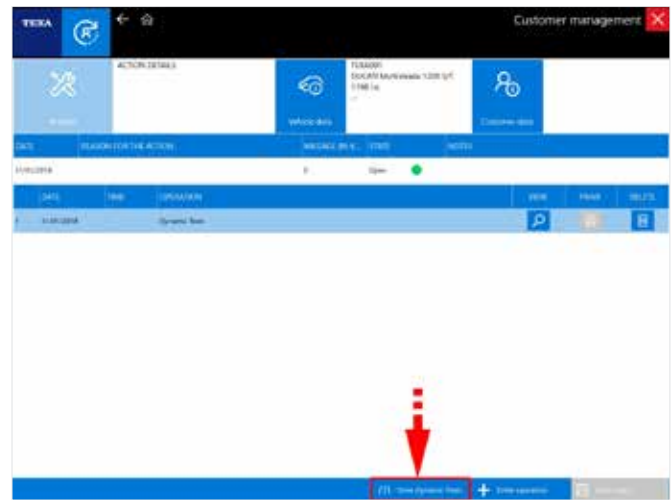

Figure 76: The acquired data can be displayed by selecting the dynamic test button
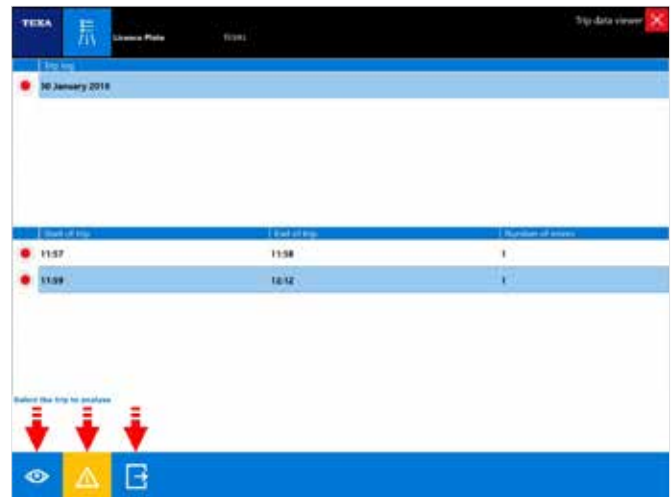

Figure 77: Recorded Trip list

ICON	NAME	DESCRIPTION
👁	View	It allows viewing the selected trip graphically
⚠	DTC	It allows viewing the list of DTCs detected during the trip
➡	Export	It opens a Windows folder allowing to save the selected trip data in a file in .csv format for further processing (ege.g. with Excel) or sending it to TEXA technical assistance

Table 3

Figure 78: It is also possible to select which parameters to view from the recording group created

Figure 79: Parameters graphical page

Legend:
A. ZOOM: Pressing the left mouse button and dragging it delimits the area for zooming
B. RESTORE: Selecting the button the zoom of the graph returns to its original condition
C. The button on the left and on the right allow scrolling the graph during the active zoom

3.6.4 Graphic Display

When the parameters page is displayed, the software proposes the display of the instantaneous value by default.
Sometimes it may be practical to have the possibility to view the values in a graphical form according to time that is to see the trend.
This mode can be activated simply by double-clicking on the parameter you want to display graphically.

Figure 80: Graphic Parameter Display

The convenience of this graphic display is to be able to monitor not only the numeric value, but also the behavior of multiple values over a certain period of time.
Figure 79 shows some parameters related to the air intake manifold and the movement of the APS and TPS sensors.

3.6.5 Actual and Minimum and Maximum values

There are three values for each item on the parameters page. The large one is the current value of the parameter, while the two smaller numbers are the maximum and minimum values reached during the self-diagnosis session (a kind of reminder of the maximum and minimum values reached by the parameter during the diagnosis).
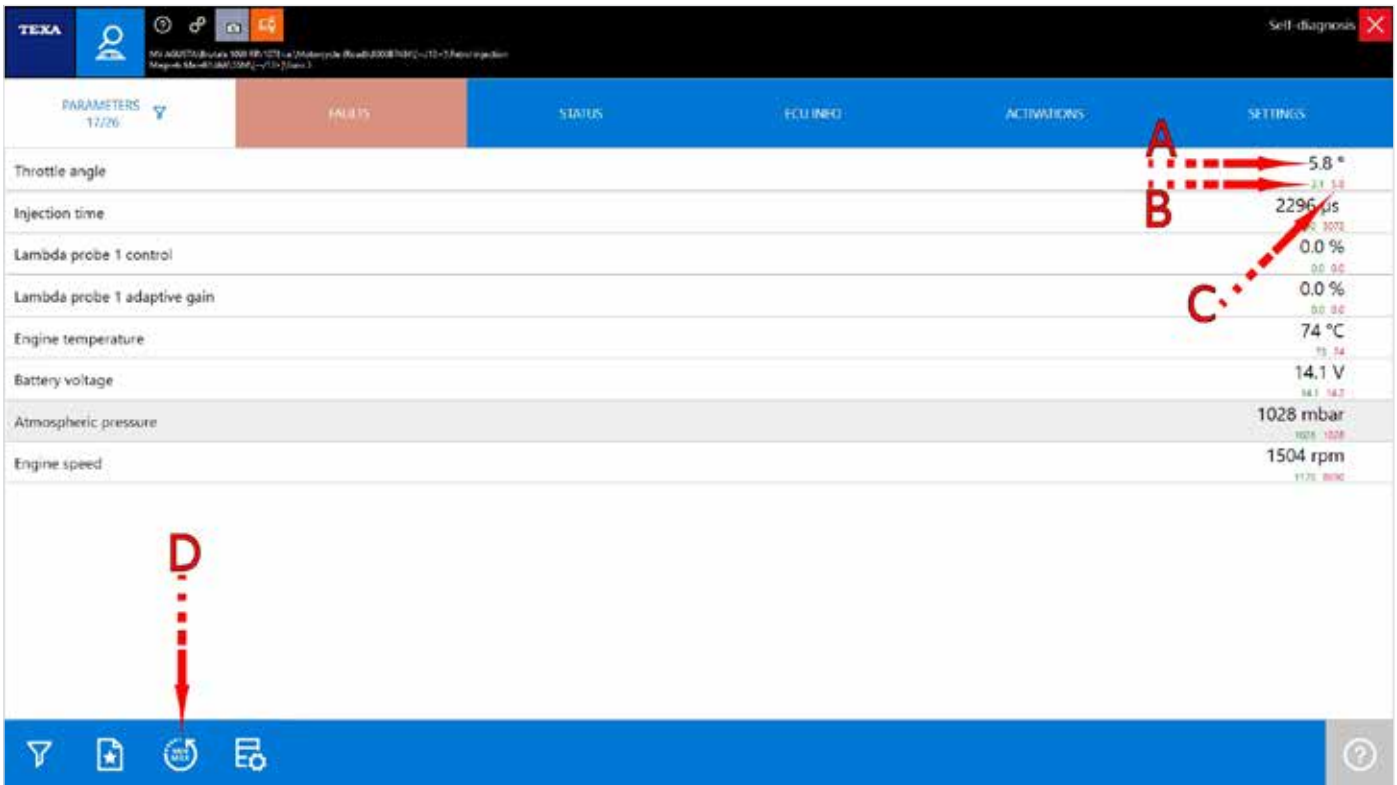
Figure 81

Legend:
A. Current Value
B. Minimum value
C. Maximum value
D. MIN / MAX value reset

In Figure 81 you can see that the value of the throttle is currently at 5.8° (A), but in the self-diagnosis session a minimum value of 2.1° and a maximum of 5.8° (B and C) were also recorded.
You can reset the maximum and minimum values at any time " ▣ " (D).

3.6.6 Logical and Physical Values

Many electronic control units allow displaying a parameter in its two possible forms:
- Physical value (rough value);
- Logical value (decoded value).

The first is the display of the signal value, analyzed in relation to its electrical components: voltage (Volt), frequency (Hertz), resistance (Ohm), etc.
The second is the interpretation of the information contents of the signal processed by the control unit: pressure expressed in bar, in ° C, sec, etc.
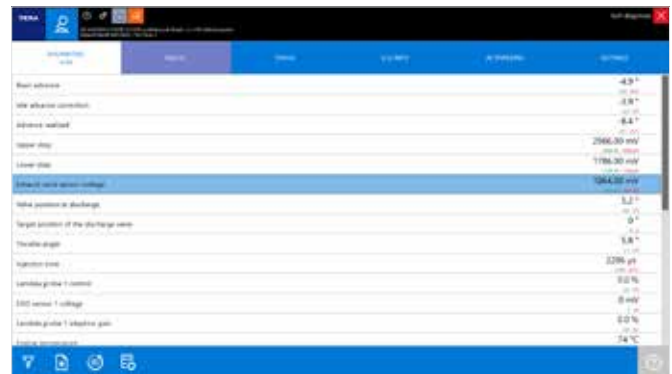

Figure 82

3.6.7 Parameter Value Update Speed

The update speed of a parameter depends on two essential factors:
1) Communication speed of the electronic control unit;
2) The number of parameters displayed.

For the first case nothing can be done.
The communication speed merely depends on the type of hardware used by the manufacturer of the electronic control unit (if the control unit is programmed to send the new value every 0.5 seconds for a particular parameter, the value will be updated every 0.5 sec.).

For the second case, however, you can try to reduce the number of selected parameters to get a quicker display.

3.6.8 Nominal Values

The Nominal Values cards assists the technician with detailed information, useful for the resolution of any errors identified during self-diagnosis.

The nominal value sheets provide a step-by-step guided procedure developed to identify the possible cause of the error and the possible solution to it. They also contain the nominal values of the electrical components concerning the stored error.

You can access the sheets only within the self-diagnosis session, in the "Documentation" section: they are divided by system and specific device or fault code, in order to make the search simple and intuitive.
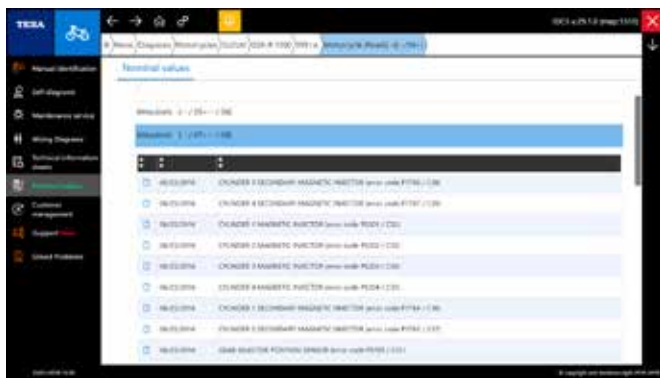
Figure 83: Nominal values sheet list

Figure 84: Nominal value sheet

3.7 Status Page

Normally, the information from the sensors is an ANALOG signal, such as the crankshaft sensor that provides the electronic control unit with the information about the speed of the crankshaft, or as in the case of the temperature sensors that provide information to the electronic control unit on the water temperature, air, etc. through a variable voltage continuously within a precise range of values. Electronic control units also need other information that can be calculated according to the position of actuators, switches, relays, system configurations, etc.

This information is precisely given by another type of sensor installed in the vehicle that provides the digital signal controller with information such as: OPEN / CLOSED, ON / OFF.

This information indicates the status of the component.

The TEXA tool allows reading the specific status through a dedicated page called **STATUS**.
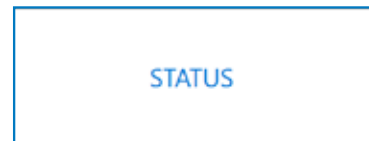

Figure 85: Status Page

In addition to provide an easy and immediate check of some components such as the clutch switch rather than the trunk opening button, this feature sometimes allows accessing essential information. In some systems, for example, in order to code the new ECU, it is necessary to read in the related Status page which components are fitted to that specific system; the precious "camshaft / engine synchronization" information that can be read on some motorbikes is relevant to identify possible causes if the engine does not start.
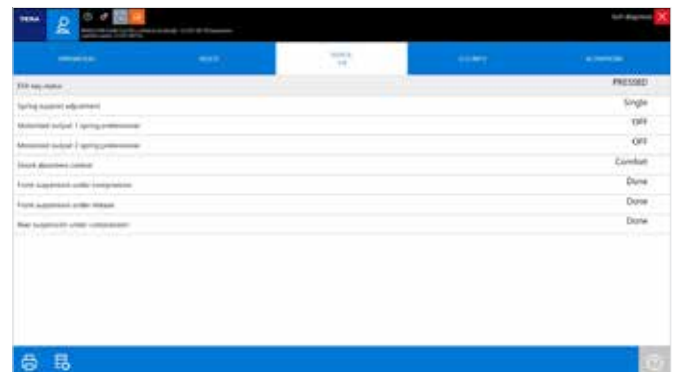

Figure 86: Status Page of the suspension ECU on BMW

> **ℹ** *With the "clutch switch" status it is possible to understand if the control unit receives the electrical signal of the component itself. By pressing and releasing the clutch pedal, the technician can detect the change from the PRESSED / NOT PRESSED condition by the diagnosis. This action will be interpreted by the control unit as the driver's intention to change gear and will accordingly apply the appropriate strategies such as, for example, the disengagement of the cruise control or fuel compensation.*

3.8 ECU Info Page

With this function it is possible to identify the Manufacturer's features of the tested control unit, both on a hardware level and on a software level.
Depending on the diagnostic system, you can obtain information such as the replacement code, date of production, and version of the software.
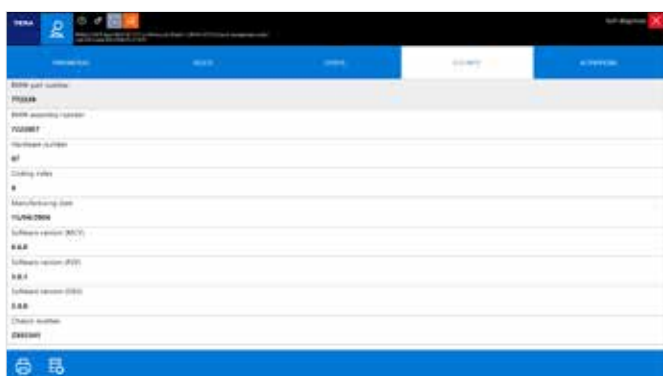
Figure 87

In addition, this page contains useful information for programming or coding when replacing the old control unit with a new one.

3.9 Activations Page

The electronic control unit is a computer that, based on the information received from the sensors and communication lines (Bus-CAN), monitors the actuators by applying the operating strategy for plant managementmanaging the system. These transactions are called ACTIVATIONS.
ACTIVATIONS, in the self-diagnosis feature, give the possibility to control the various actuators connected to the specific electronic control unit directly from the diagnostic tools.
This type of test is performed by the controller itself based on a command given by the diagnostic tool.

So theThe component activation overcomes the normal runningoperating logic of the control unit.
From the activationactivations page you can directly actuate spieswarning lights, solenoid valves, injectors, etc ....
This function should be used primarily to test the operation of components whosethe control of which would otherwise result in a loss of time.
It can also be used to understand the many equal components the diagnosis refers to.
For example, if I havethere are two solenoid valves selected that are the same, such as the EGR command and turbine geometry, and Iyou do not know which of the two EGR commands, I the EGR, you can activate the component I'm interested in by detecting whichselect one of them is activatedto detect which one activates.
In some cases, activations do not only have diagnostic capabilities but are required to perform maintenance procedures.
As is the case forFor example, in some engine systems where it is possible to changein which the injection or ignition time orcan be changed or to allow the brakes to bleed in some ABS systems.

Figure 88: The ACTIVATION list available in the specific ECU is related to the Manufacturer

- The ACTIVATIONS function has differences that depend on the manufacturer, the model and the electronic system.
- The number of devices to be activated and the test execution mode depend strictly on how the controller software is designed and not on the capabilities of the diagnostic tool (see, for example, the difference between BMW and other manufacturers).
- Some control units enable activation tests with the vehicle moving. This possibility of diagnosis could be very dangerous when it comes to diagnosing safety systems such as ABS or AIR BAG. In fact, the direct activation of a security

After selectedselecting the vehicle to be diagnosed, there are two buttons that give the possibility to quickly access a series of features, without having to connect to the electronic control unit first.

ICON	DESCRIPTION
☀ Maintenance service	Allows accessing the adjustment functions to reset the deadlines in the maintenance systems
⚒ Special Functions	Allows accessing the special functions of settings and/or activations of the systems/components related to the selection of the vehicle made

Table 4: Motorbike Maintenance menu

Each single function thus allows quick access to the Activations and/or Adjustments without having to connect to the specific control unit that manages the specific function the technician would like to test.

3.11.1 The Maintenance Service menu

The "Maintenance Service" menu contains all the Settings needed to reset the maintenance lights.
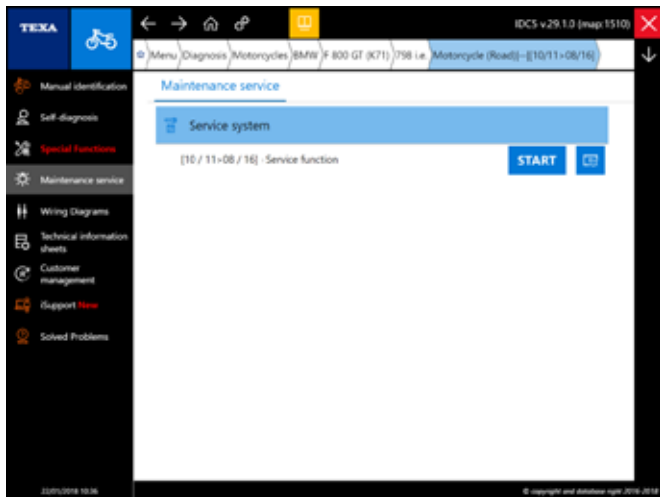
Figure 95: Maintenance menu on BMW K1300 GT

For example, in the figure above, in order to check the parameters of the maintenance system on a BMW K1300 GT you must reset the service.

3.11.2 The Special Functions menu

The "Special Functions" menu contains all the Settings that are important in the maintenance process of the motorbike but are not considered common operations, such as the BMW CIP function (changing the display settings, enabling the heated handle grips, etc.) and special settings for Harley Davidson (idle adjustment, exhaust valve enabling/disabling).
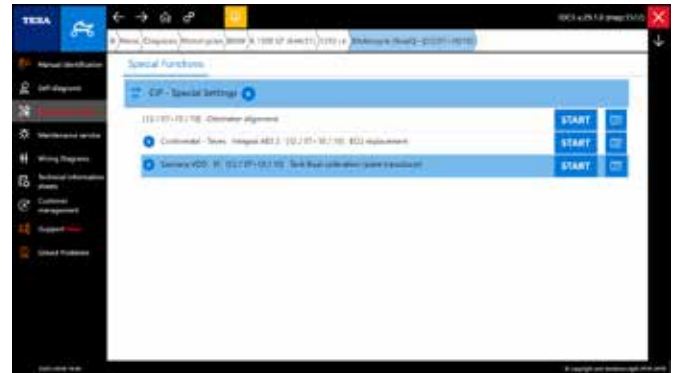
Figure 96: Calibration of the fuel level sensor selection

3.12 The IDC5 Technical Documentation

It's not just Self-Diagnosis that is needed for modern mechanics, but often the difference between self-diagnosis itself, and all the additional information that allows us to understand the functioning of a system and which provide us Control and verification data.

In fact, reading the "Intake air low deviation" it only helps to define the problem area, but if you do not know the vehicle and the system under test, it's just partial information.

To compensate for this within the TEXA diagnostic environment we can find various types of technical information:
- Wiring diagrams, with the related component data sheets
- Bulletins and technical sheets
- System description sheets

3.12.1 ⋔ Wiring Diagrams

The wiring diagrams are very important for the technician and workshop in general.

In fact, many vehicle issues require checking the wiring and/or specification checks by the electrical signals on the cables.

system actuator will force the electronic control unit, causing improper behavior of the vehicle.
- Activating some components (such as the ABS solenoid valves) may not have a preset activation time; in this case it will be up to the operator to disable the component after a few seconds to avoid overheating and possible failure.

3.10 Settings Page

The majority of the latest ECUs produced, regardless of the type of system they control, have the option of being configured without operating directly on the hardware part. This is possible because they adopt a flash rewritable EEPROM memory.

Using this technology and external power connections to the control unit, it is often possible to quickly change the software settings programmed by the manufacturer. In fact, the reprogramming has the purpose of modifying the controller's behavior in the system's management.

External programming, carried out with appropriate tools, is now widely used by all manufacturers of motor vehicles, light commercial vehicles and industrial vehicles.

This type of solution allows using a single type of control unit to handle different systems: the control unit is adapted to the various models in which it is used. The possibility of adapting the control unit to the various solutions required is called **CONFIGURATION**.
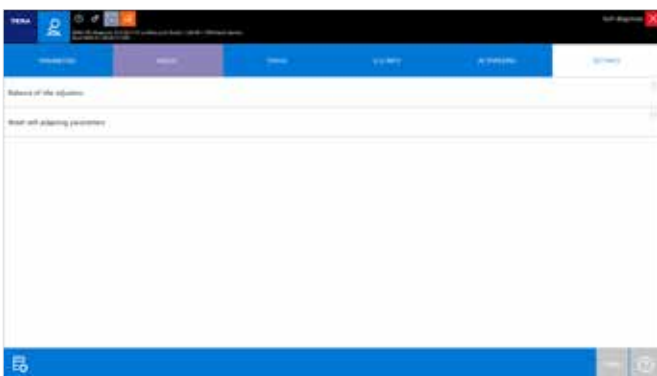
Figure 89: SETTINGS page & settings available

The "Settings" procedures are not only related to the possibility of coding the control unit, but often are very important to perform just common maintenance operations such as replacing brake pads or clearing the expired maintenance notice.

With self-diagnosis tools, various types of encoding can be performed depending on the type of control

unit, the manufacturer and the vehicle on which it is being used.

In the following chapters, we will discuss some of the most common encoding procedures, analyze some differences between the various manufacturers, and explain how the coding procedures can be performed from the Settings page.

> ℹ️ *Starting from chapter 5 there will be examples of Settings according to the electronic systems, how to use the page with a detailed explanation of the procedures to carry out.*

3.10.1 ECU Reprogramming

The notification of possible updates of the ECU mappings takes place automatically as soon as the TEXA IDC5 software is started (The computer MUST be connected to the internet).

When the software starts, if new mappings are available, the following screen will be displayed:

Figure 90: When the IDC5 software is started, if updates are available, a window is displayed with the possibility to download the mappings

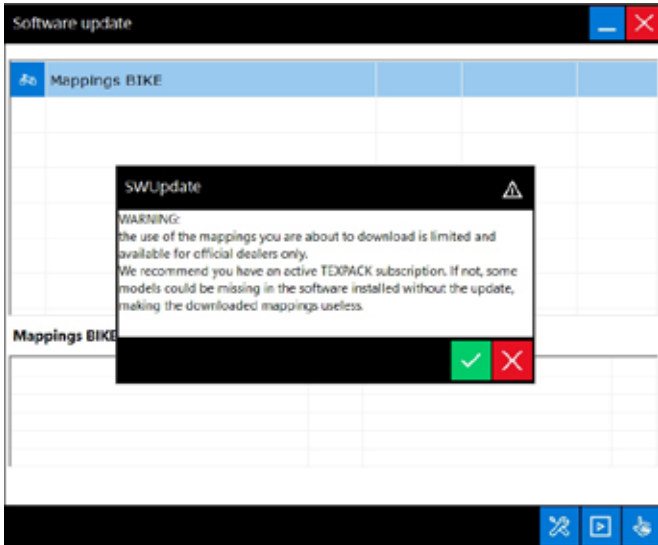Then, just select the command "Mappings BIKE" and click on the button "DOWNLOAD UPDATE"

Figure 91: The mappings are for exclusive use of the authorized workshops of the manufacturer

Then, after carefully reading the pop-up that appears on screen automatically, all the new mappings that TEXA releases in agreement with the manufacturers that use the IDC5 software as their official tool will be downloaded.
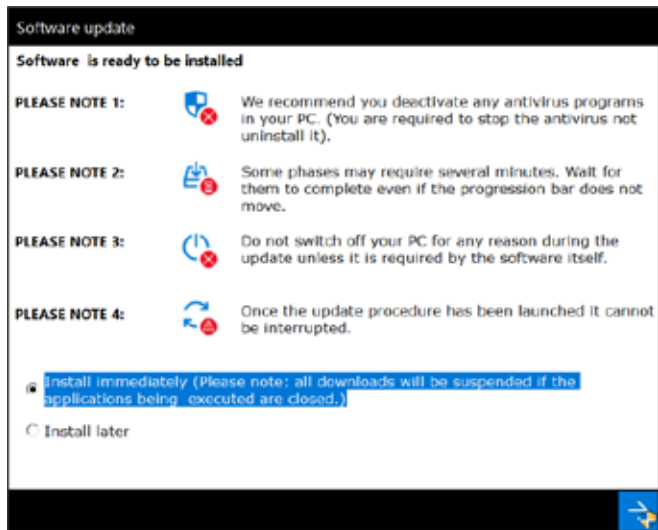

Figure 92: The mappings can be installed immediately during the downloading phase
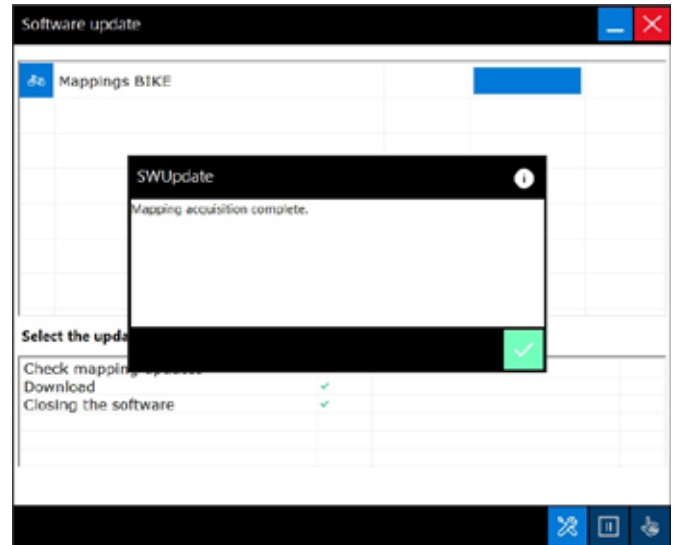
The download is complete when the following screen appears:

Figure 93: : Update successfully completed

> ⚠️ **Before downloading the ECU mappings or before reprogramming the motorcycle, make sure you have installed the IDC5 version listed in the technical sheet or bulletin sent by the manufacturers. In fact, the software installed without having been updated may be missing some models and makes and the downloaded mappings are useless.**

3.11 The Vehicle Maintenance menu

Until a few years ago, the traditional self-diagnosis method was to connect to the control unit, see the stored DTCs, and perform the repairs accordingly. This is just one of the possibilities.
It often happens that the technician's operations on a motorbike require using fast functions, such as resetting the parameters, performing an encoding, or just testing a single component.
This is why TEXA has developed a series of fast functions that are quickly accessible.
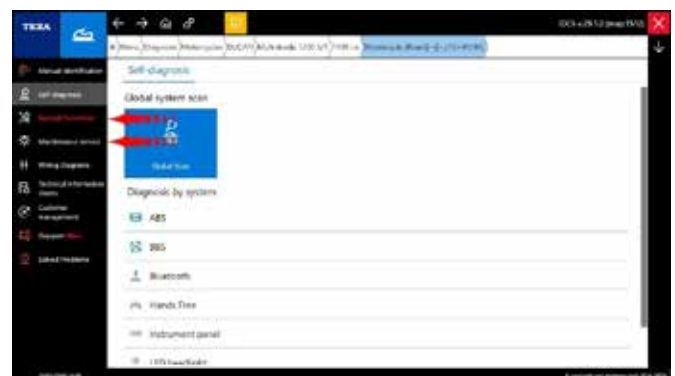
Figure 94: Vehicle Maintenance Menu

It is possible to access the wiring diagrams both in free consultation mode and within the Self-diagnosis. Selecting the "Wiring Diagrams" ▐ menu, a list of the all wiring diagrams available for the selected vehicle, grouped by system type, will be displayed.
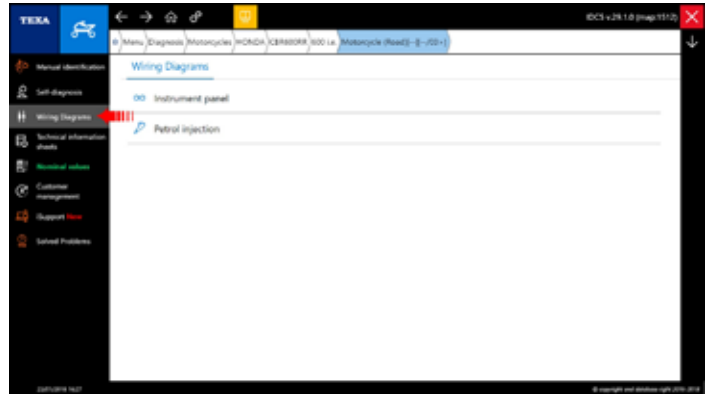
Figure 97: The Wiring Diagram appears when the vehicle has been selected

The wiring diagram can be displayed on several pages and a series of specific commands and functions are available with all the information related to it.
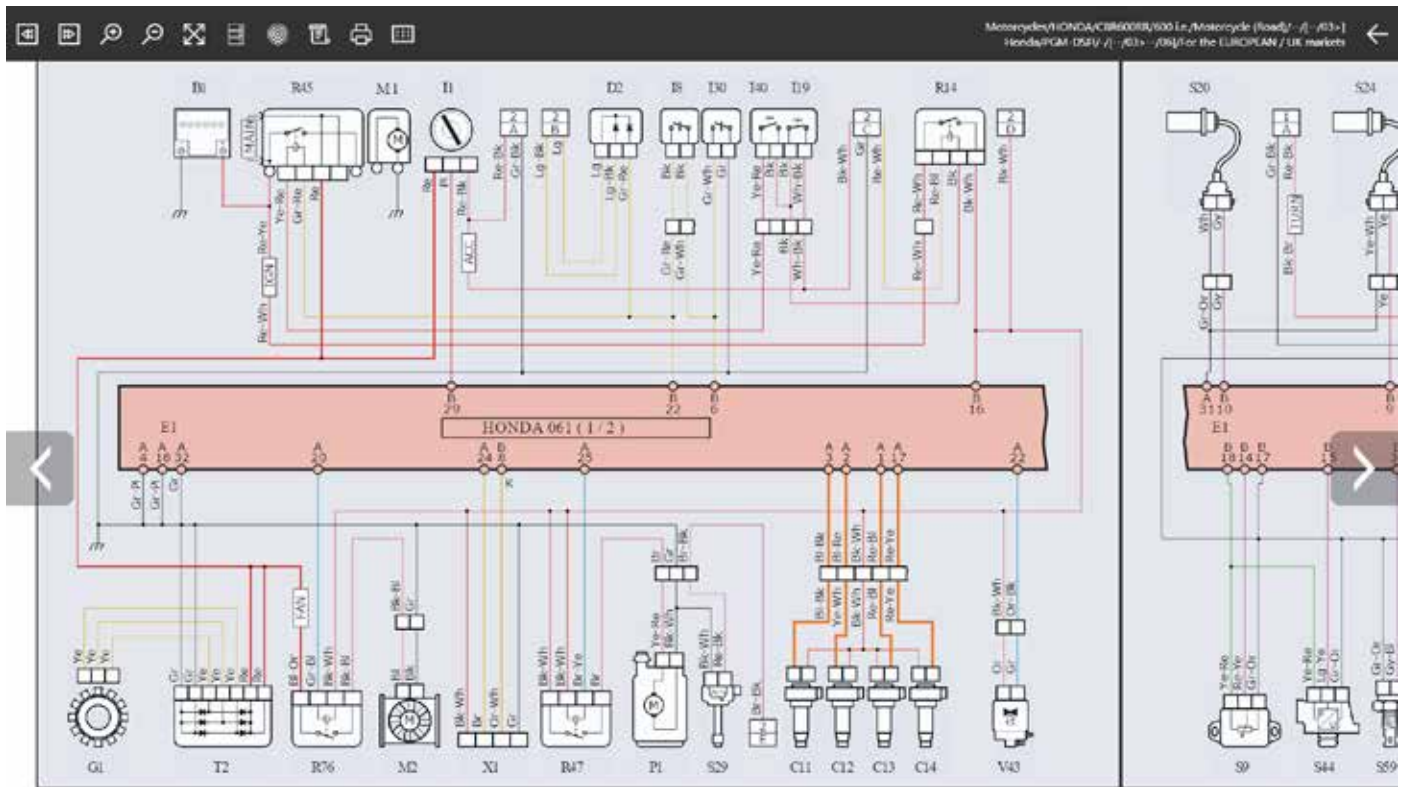
Figure 98: Engine management Honda CBR600RR pages 1/2

Another feature introduced is the interactive display mode that helps technicians investigate the path of the cables within the wiring diagram. Simply move the cursor over the single cable to see the complete path within the diagram.

> ℹ️ *For an easier understanding of the system diagram, the display is standardized for every manufacturer based on a univocal logic.*

Icon	Name	Description
	Previous / Next page	Allows moving between different pages of the same wiring diagram (only for multi-page diagrams).
	Zoom In/ Out	Allows zooming in the desired wiring area.
	Full Screen	Allows returning to the Full Screen display of the wiring diagram.
	Device Legend	Allows viewing the list of components in the wiring diagram.
	Device Location	Allows viewing the location of the desired component.
	Diagram Legend	Allows viewing the color code used in the links.
	Print	Allows printing the Wiring Diagram and the Legend.
	Interactive Wiring Diagram	Allows viewing the details of all the cable connections selected.

Table 5: Wiring Diagram tools

Moving the pointer over the symbols in the Diagram shows a label identifying the component and indicating its location.
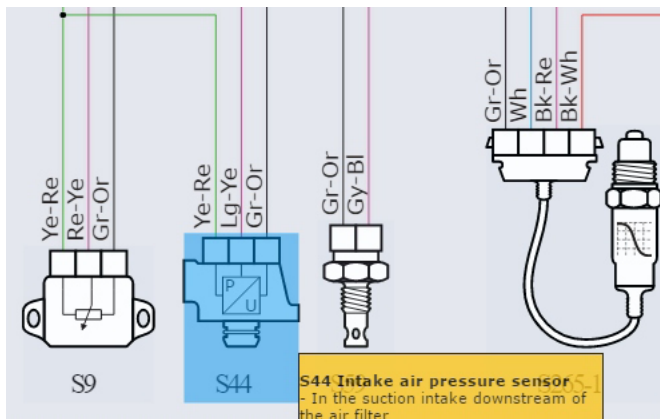
Figure 99: Intake suction pressure sensor identification with location description

By clicking on the symbol of a component, the menu of the available functions is displayed.

Icon	Name	Description
	Technical Sheet	Displays a technical datasheet of the selected component.
	Image	Displays a photo of the component.
	Manual Mode	Allows executing the oscilloscope command interface.
	Connector	Display a pinout image of the connector.

Table 6: Controls and functions of the electrical diagram component

> **i** *Not all commands are available for all components.*
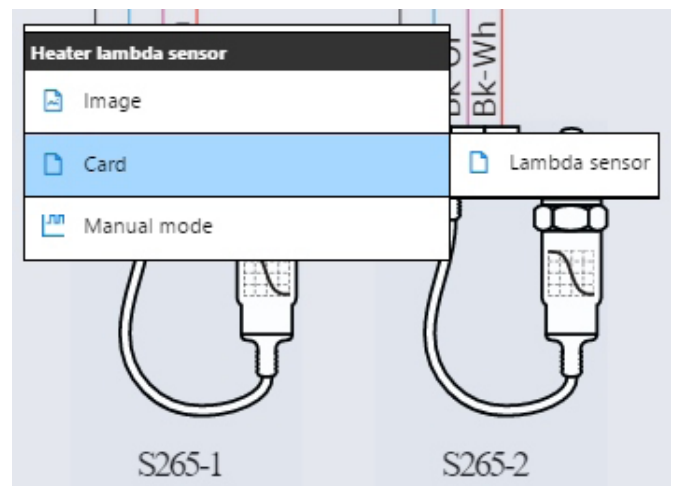
Figure 100: Under the menu the technical sheet connected to the oxygen sensor is displayed

For example, the technical sheets of a component can explain the operating principle, the technical characteristics and the control values, the operating aid in Self-Diagnosis: depending on the type of component, it is possible to find several sheets for a specific topic.

Figure 101 shows the data sheet of one of the two oxygen sensors, in which you can see the operation and the characteristic waveform that this component must have.
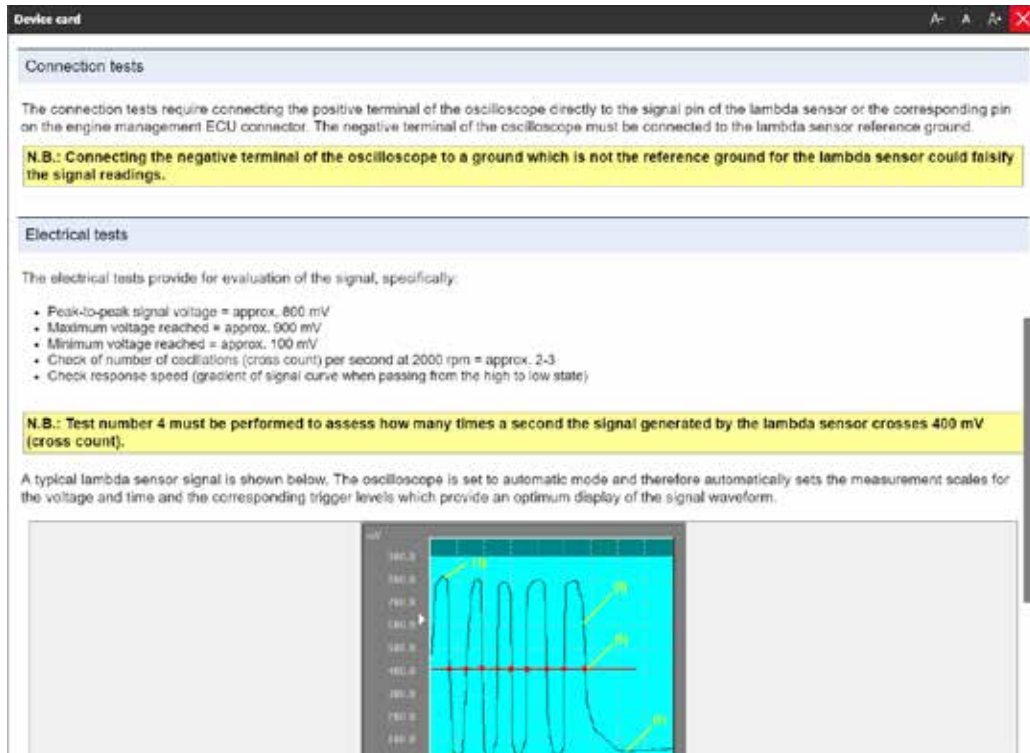
Figure 101

It is often necessary to be able to consult wiring diagrams during a self-diagnosis session.
On the various screens there is a "⧉" button (Parameters, Activation, Adjustments page, etc.) that allows accessing all the documentation that supports self-diagnosis.
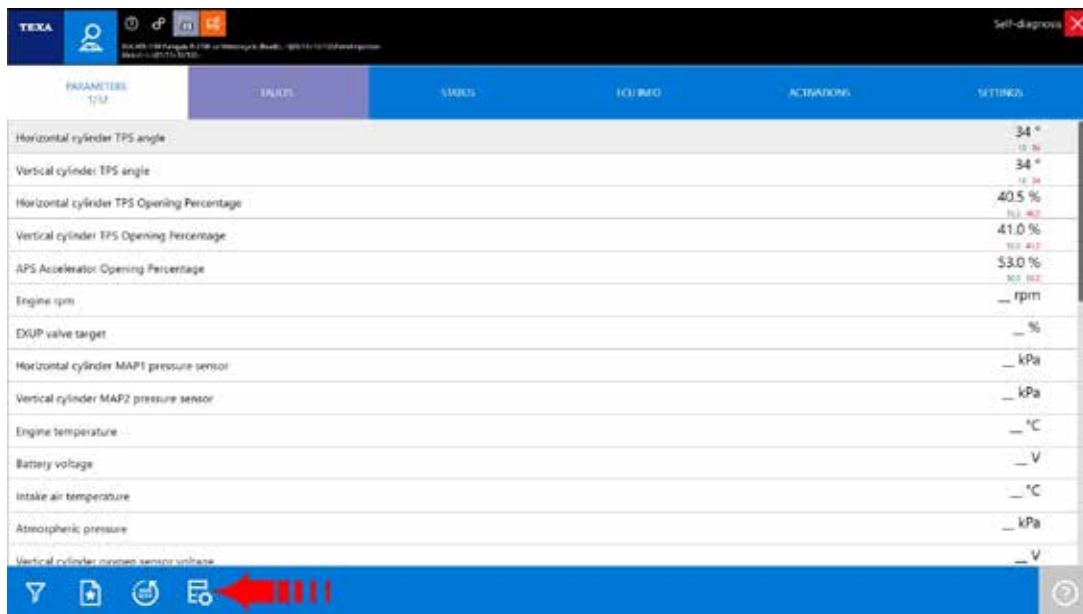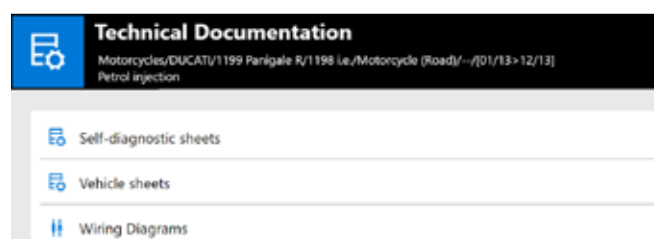

Figure 102: Location

Figure 103: List of the Technical documentation available

3.12.2 Bulletins and Technical Sheets

Nowadays, the technician of a multi-brand workshop has to face a great variety of systems from different manufacturers, each with its own peculiarities.

This, of course, is not always possible. The huge number of manufacturers and variants makes an in-depth knowledge of each system practically impossible.

For this reason, TEXA provides a range of technical sheets and information for the diagnostic systems. This information is available, sorted by system and/or vehicle, by clicking the " ⊟ " button.
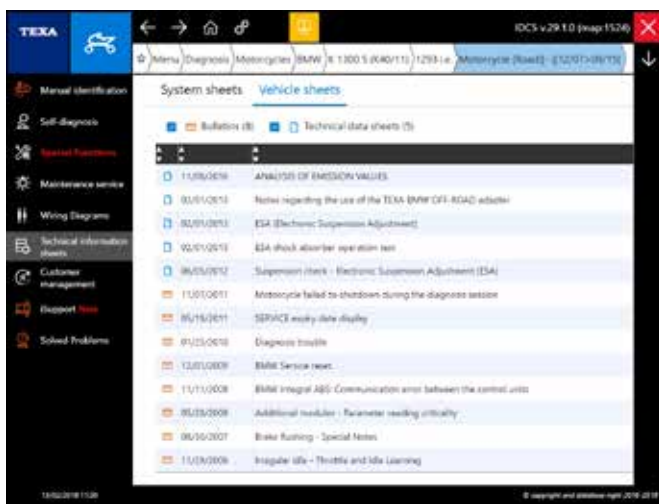
Figure 104: Sheets and Technical Bulletins

There are two types of technical information: Sheets and Bulletins.

Icon	Name	Description
	Sheet	Displays a descriptive data sheet for the selected system.
	Bulletin	Displays a document that shows a specific problem and/or solution.

Table 7

Each of these two types can be found under two different categories:
- System sheets;
- Vehicle sheets.

The System Sheets contain information related to a specific system, while the second contains valid information for the entire vehicle.

Due to the nature of the information and the explanation of "practical" problems, technical

bulletins are constantly updated and made available to the public (subject to a subscription).

This way you are constantly updated with the latest information available.

3.12.3 Smart Solved Problems (powered by Google©)

TEXA has been on the Self-Diagnosis market since 1992, and since then it has gathered a great deal of experience, but above all it is the experience of its customers that makes the difference! For this reason, two specific databases have emerged over time, where the experience from both TEXA and its customers is collected.

Thanks to these databases, mechanics are able to complete the repair quickly and using the proper procedure.

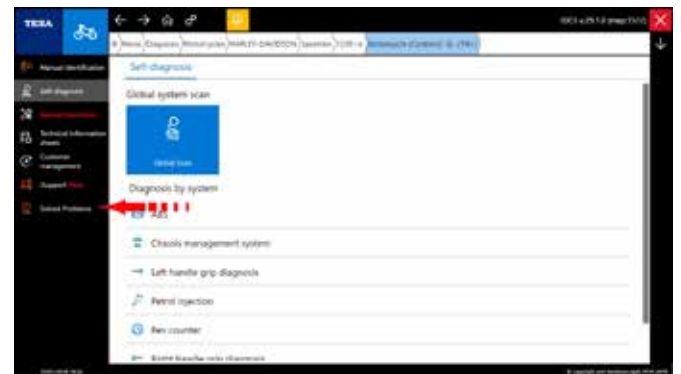These databases can be accessed either from the IDC5 operating environment or from the self-diagnosis ( ).

Figure 105: Access to Solved problems from the main menu after selecting the vehicle

Figure 106: Access to the Solved problems function from the Self-Diagnosis menu

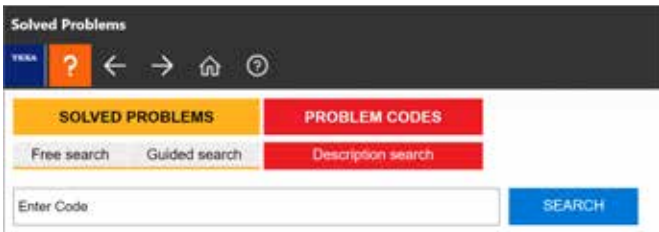*Figure 107: Fault finding by description using keywords*

Figure 108: Troubleshooting by error code

> ⚠ **In order to use the database, the diagnostic tool must be connected to the Internet and the related subscription contract (where applicable) must be active.**

3.12.4 🖥 Self-diagnosis cable list

The diagnostic interfaces produced by TEXA to connect to the electronic systems available in the motorbikes require using a specific diagnostic connector for each manufacturer.

Considering the large number of motorcycles in IDC5 and therefore of diagnostic cables present in the TEXA catalog, in order to simplify the search for the correct cable, a free APP has been introduced with information on the availability of diagnostic cables for which a standard cable is not yet available. It consists of four sections, from which you can access the complete list of cables used by the software, those used by each make, the list and descriptions of the cable cases available and the information on the adapters to use with compatible tools in other environments.
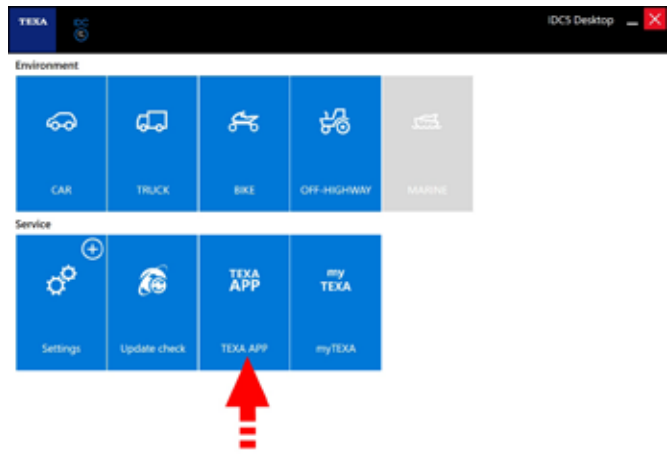
Figure 109: The search for the bike cables app starts with the installation from the TEXA APP menu
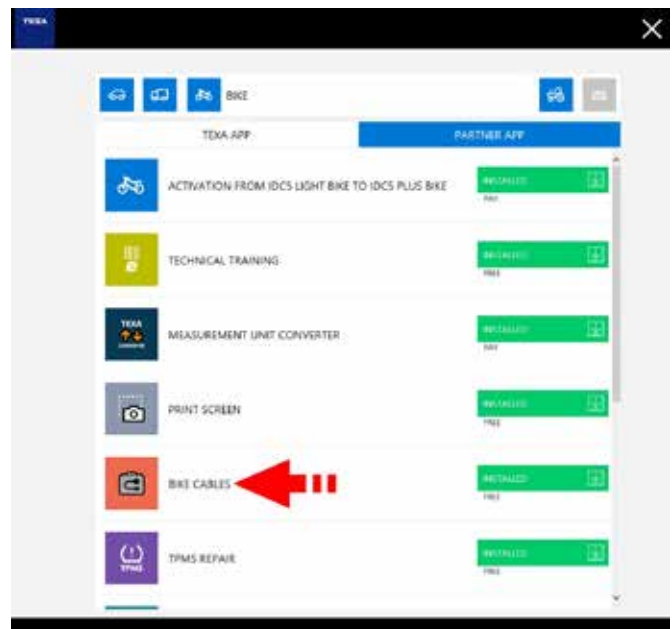
Figure 110: The Cable app is in the list of apps available for the bike environment
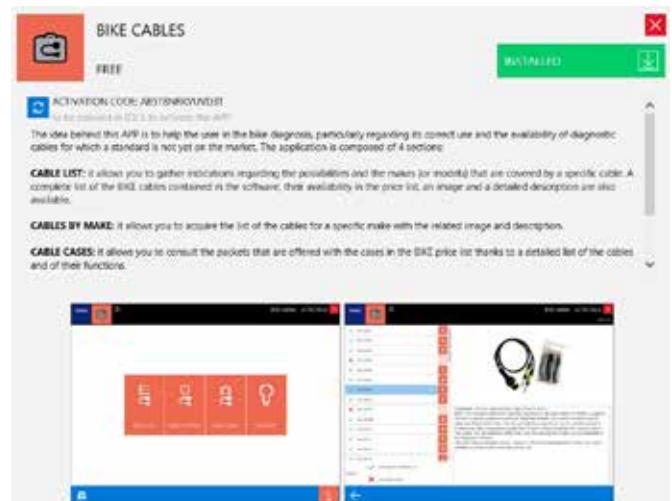
Figure 111: Once selected, the App can be installed using the button at the top right
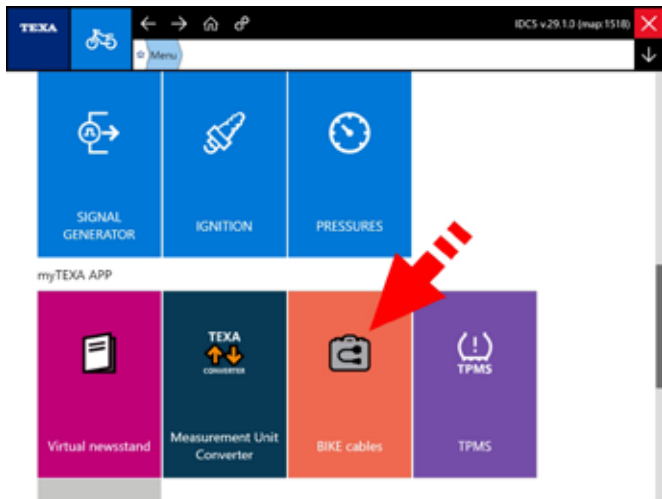
Figure 112: Once installed, the App will be enabled in the myTEXA APP section

Figure 113: The cable search is subdivideddivided by cable code, by brandmake and by suitcasecase kit. Furthermore, the adapters necessaryneeded for the connection to the various TEXA self-diagnosis interfaces are indicated

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4.REGULATIONS FOR THE POLLUTANTS CONTROL AND EOBD SYSTEM

Pollution is a phenomenon that is not limited to the emission of toxic gases from power plants, heavy industries and vehicles.

In fact, it often also involves a series of very complex chemical reactions the repercussions of which have not yet been clearly defined, despite the exhausting discussions by experts around the world.

On 17 June 1997, the Directive 97/24/EC implemented the Euro 1 standards to reduce the emissions of two- and three-wheeler vehicles that are included in this category, the "L" category.

These new standards have been adopted in two different steps for mopeds, and in just one for motorcycles.

Directive 2002/51/EC modifies Directive 97/24/EC of 19 July 2002 and implements the Euro 2 and Euro 3 standards for motorcycles.

Standard	Class	Last approval date	Last Registration date	Regulations / Identification
Euro 0	Mopeds, motorcycles and tricycles	---	17 June 2004	---
Euro 1	Mopeds, motorcycles and tricycles	17 June 1999	1 July 2005	Directive 97/24 / EC Chap. 5
Euro 2	Mopeds	17 June 2002	31 December 2007[1]	Directive 97/24/EC Cap. 5 Phase II
	Three-wheels	1 January 2003		Directive 2002/51/EC Phase A
	Motorcycles	1 April 2004		
Euro 3	Motorcycles	1 January 2006	1 January 2017	Directive 2003/77/CE Reference 2002/51/ EC Phase B OR 2006/120/CE

Table 8: Emissions regulation, Euro Standard 1-3

> **ℹ️** *As you can see, there have been periods of overlap in the sales of vehicles of different categories. The law established the mandatory dates of the new approvals, leaving time for the depletion of stocks of vehicles approved according to previous protocols.*

In 2013, Regulation (EU) No. 168/2013 extends the number of "L" categories and updates the adoption dates for Euro 4 and Euro 5 standards. The new legislation explicitly covers hybrid vehicles also.

From the air quality point of view, the first goal is to maintain constant or even reduce the total emissions of the "L" category vehicles compared to vehicles belonging to other categories (Motor vehicles, Heavy vehicles, etc.).

Vehicle Category	Vehicle category name	Propulsion class	CO (g/km)	THC (g/km)	NOx (g/km)	PM (g/km)	Test Cycle
L1Ae	Powered cycle	PI/CI/Ibrida	0.50	THC 0.10	0.060	0.0045*	Revised WMTC
L1Be-L7e	All other L-category vehicles	PI/PI Ibrida	1.00	NHMC 0.068	0.060	0.0045*	Revised WMTC
			0.50		0.060	0.0045	

Note:
* Applicable to petrol direct injection (DI) engines only

Table 9: Emissions regulation, Euro 4-5 Standard

In fact, a first evolution step towards the emission reduction occurred with the adoption of increasingly innovative electronic management systems for the fuel injection phase, and of catalytic converters and qualitative discharge sensors. These innovations on vehicles have determined by themselves the reduction of about 70% of the main regulated emissions: **CO**, **HC**, **NOx**.

The indications of the development of engine technology identify different fields of intervention including:

- The development of on-board electronic diagnostic equipment aimed at the active and instantaneous monitoring of the optimal operating modes of the propulsion system;

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1   *Initially the deadline was scheduled for December 31, 2006, then extended another year. The deadline for registrations was moved to June 2008 if a maximum of 5000 vehicles were sold in Europe.*

- Research in aerodynamics, the development of low rolling resistance tires, the reduction of weights with the use of new materials.

Vehicle Category	Vehicle category name	Propulsion class	CO (g/km)	THC (g/km)	NOx (g/km)	PM (g/km)	Test Cycle
L1Ae	Powered cycle	Positive Ignition (PI)/ Compression Ignition (CI) / Hybrid	0.56	0.10	0.07	-	UNECE R47
L1Be	Two-wheel moped	PI/CI/Hybrid	1.00	0.63	0.17	-	
L2e	Three-wheel moped	PI/CI/Hybrid	1.90	0.73	0.17	-	
L3e L4e* L5Ae L7Ae	•Two-wheel motorcycle and sidecar •Tricycle • Heavy on-road quad	PI/PI Hybrid, vmax<130km/h	1.14	0.38	0.07	-	WMTC[2], phase 2
		PI/PI Hybrid, vmax≥130km/h	1.14	0.17	0.09	-	
		CI/CI Hybrid	1.00	0.10	0.30	0.08†	
L5Be	Commercial tricycle	PI/PI Hybrid	2.00	0.55	0.25	-	UNECE R40
		CI/CI Hybrid	1.00	0.10	0.55	0.08†	
L6Ae L6Be	Light on-road quad Light quadri-mobile	PI/PI Hybrid	1.90	0.73	0.17	-	UNECE R47
		CI/CI Hybrid	1.00	0.10	0.55	0.08†	
L7Be L7Ce	Heavy all terrain quad Heavy quadri-mobile	PI/PI Hybrid	2.00	0.55	0.25	-	UNECE R40
		CI/CI Hybrid	1.00	0.10	0.55	0.028†	

Note:
* Only the base two-wheel motorcycle to which the sidecar is fitted must meet the appropriate emission limits.
† CI only, also if e.g. a hybrid concept includes a CI engine.

Table 10: Euro 4 emission limits from the exhaust after cold start

Furthermore, Euro 4 introduces the On Board Diagnostic (OBD) requirements for motorcycles and tricycles. The measurement of carbon dioxide (CO_2) as part of the approval process is now required. In addition, Euro 4 bikes with a displacement of more than 125 cm3 must be equipped with ABS. Finally, the legislation requires an important reduction of the noise produced at the exhaust, which profoundly affects the dimensions of the silencers.

> **i** *However, remember that the self-diagnosis resources of the OBD system are limited to the verification of the emission control systems and therefore must not be confused with the specific diagnostic systems for the electronic system present on each bike.*

4.1 Recognizing the Euro regulations in the registration certificate

To understand what type of homologation a motor vehicle respects, consult the registration card, more known as "Owner booklet". Here the following terms for each type of approval (Euro 1, Euro 2, Euro 3, etc.) must be indicated.

Category	Mopeds and motorcycles	Mopeds	Motorcycles	Mopeds	Mopeds	Motorcycles
YEARS	EURO 1: 17/06/1999	EURO 2: 2002	EURO 2: 2004	EURO 3: 2006	EURO 4: 2017	EURO 4: 2016
DIRECTIVE n°	97/24 CE	97/24 CE phase II 97/24 CE ref. 2003/77/CE phase A	2002/51/CE phase A 97/24 CE ref. 2003/77/CE phase A	97/24 CE cap. 5 phase III 97/24 CE ref. 2003/77/CE phase B 2002/51/CE - Phase B 2003/77/CE ref. 2002/51/CE - Phase B 2006/120/CE	168/2013/CE	

Table 11
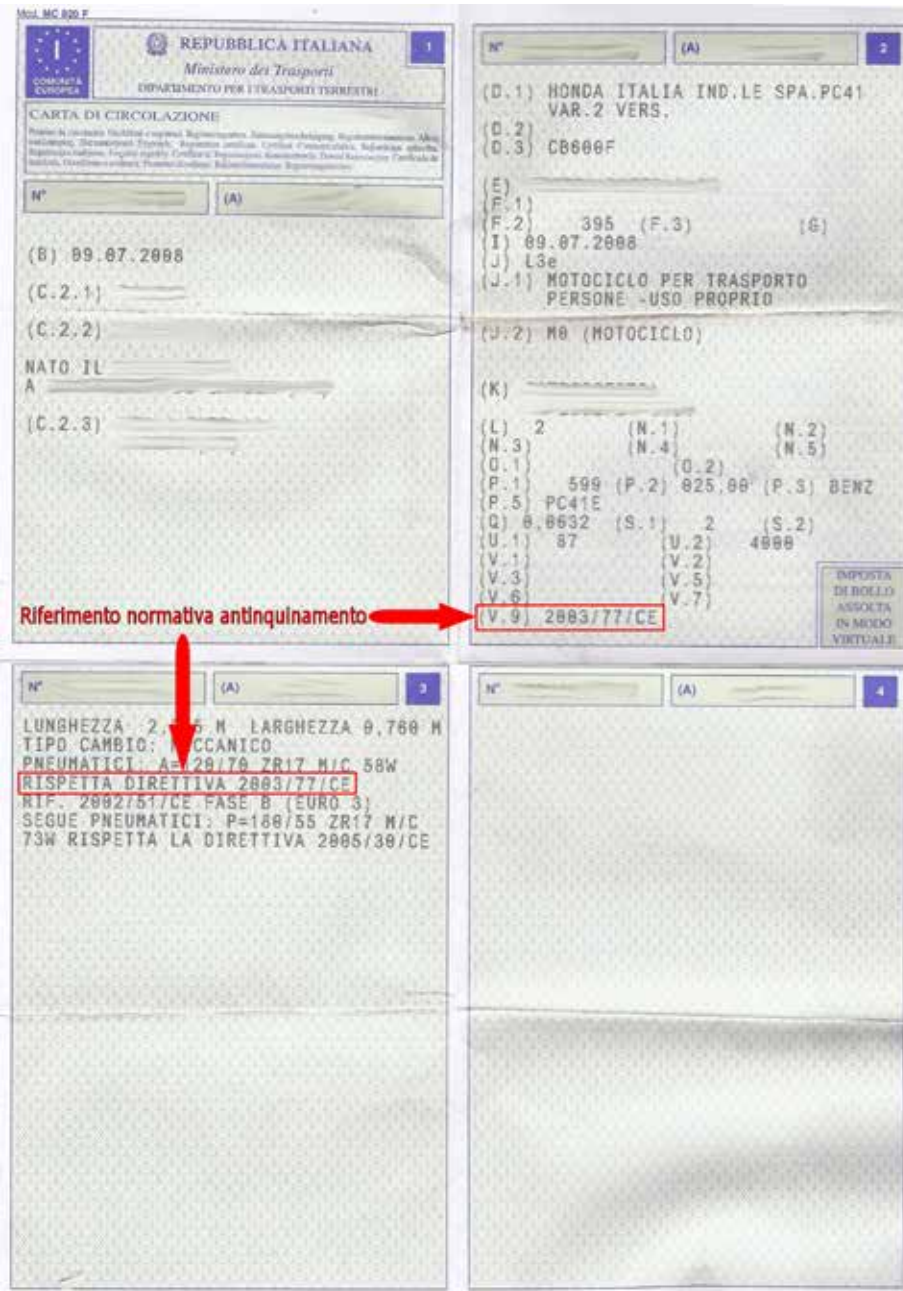
Figure 114

4.2 European Law for the On Board Diagnosis (EOBD)

"In order to improve the functioning of the internal market, in particular as regards the free movement of goods, freedom of establishment and freedom to provide services, unlimited access to vehicle repair information is necessary, through a standardized search function which enable the gathering of technical information and effective competition on the market for information services relating to vehicle repair and maintenance. Much of this information refers to on-board diagnostic systems and their interaction with other vehicle systems. It is appropriate to lay down both the technical specifications which manufacturers should comply with on their websites and ad hoc measures to ensure reasonable access for small and medium-sized enterprises".

There must be an «on-board diagnostic system» or «OBD system»: a system capable of identifying the area of the probable malfunction by means of fault codes inserted in the memory of a computer.
Manufacturers are obliged to allow independent operators unrestricted access to vehicle repair and maintenance information, using standardized, easily usable and rapid format websites. In particular, such

Manufacturers are obliged to allow independent operators unrestricted access to vehicle repair and maintenance information, using standardized, easily usable and rapid format websites. In particular, such access must not be discriminatory with respect to the assistance or access authorized dealers and repairers benefit from. This obligation does not apply if a vehicle is approved as a small-series vehicle.

4.3 Activation of the malfunction indicator (MIL)

"The OBD system must include a malfunction indicator (MIL) that is easily perceived by the vehicle driver. MIL must not be used for purposes other than emergency start-up or reduced efficiency reporting and must be visible in all normal light conditions.

A motor vehicle must be equipped with no more than a general MIL for emissions problems. The presence of other lights with different specific functions is permitted. For the ML indicator, the use of red is not permitted.

MIL must also operate whenever the engine is in the normal operating mode, the emission limits are exceeded or the OBD system is unable to meet the specified control requirements.

MIL must provide a distinct signal, such as an intermittent light, whenever an uneven ignition of the engine occurs which could cause a catalyst failure. MIL must be activated when the injection of the vehicle is activated before the engine is started and deactivated after the engine has been started if no malfunction has been detected ".

Figure 115: MIL light

4.4 Trouble Code Storing

The OBD system must register the code or codes that indicate the status of the emission control system.

Different codes must be used to identify the emission control systems that work properly and those that require further use of the vehicle in order to be fully evaluated. If the MIL is switched on and at the same time a fault code must be stored, that identifies the type of malfunction.

After the MIL has been activated, the value of the distance traveled by the vehicle must be available through the serial port of the standard connector for data transmission (this requirement applies only to vehicles equipped with an electronic device that transmits the data on the regime to the controller of the engine provided that the ISO standards are completed within a period compatible with the application of the technologies).

Errors detected by the engine control module relating to emissions and pollution must be classified as shown in the following table:

| P | 0 | 3 | 0 | 1 |

| B- Body
C- Chassis
P- Powertrain
U- Network | 0- Generic
1- Manufacturer specific
2- Generic |
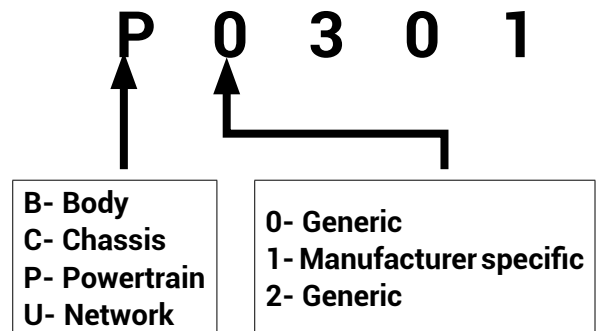
Table 12

If the error is not relevant for the OBD check, the manufacturer has the right to report the fault in another way.

For example by turning on another fault indicator, such as this one:

Figure 116: Generic engine light

4.5 Scan Tool

The legislation states that: "After identifying the first malfunction of a component or a system, the current engine conditions must be stored in the control unit as frozen information".

Additionally, car manufacturers must allow a generic diagnostic tool to access to the diagnosis of the control units involved in engine management, which is named Scan Tool.

The Scan Tools must be able to read the conditions of the engine stored during normal operation and after storing an error (frozen parameters).

These must include:
- the number of kilometers traveled with the MIL on;
- the calculated load value;
- the engine speed;
- the fuel supply adjustment value (if available);
- the status of the fuel control system;
- the injection timing advance;
- the air temperature;
- the air flow;
- the pressure in the intake manifold;
- the fuel pressure (if available);
- the vehicle speed (if available);
- the coolant temperature;
- the intake manifold pressure (if available);
- operation in closed or open circuit ("closed loop" or "open loop") (if available);
- the outlet value of the throttle position sensor;
- the secondary air status and the fault code that determined the data storage.

The indication "Pass / Fail" of the latest test results

must also be available for the systems and devices checked.

Figure 118: Display of the start page of the new OBD Scan Tools TEXA

4.6 The Trouble Code

The rule states that failures are stored through error codes, which are alphanumeric and individually identify a failure.

The EOBD and OBD II error codes consist of 5 characters: a letter followed by 4 numbers such as P0101.

The **first** character is a letter and identifies the system that generated the code and can be:
- B) Body;
- C) Chassis;
- P) Engine;
- U) CAN Bus;

The **second** digit is a number and identifies the type of code:

Code	Generic code defined by the EOBD / OBD II protocol and is the same for each manufacturer	Manufacturer specific code
P0xxx	X	
P1xxx		X
P2xxx	X	
P30xx-P33xx		X
P34xx-P39xx	X	

Table 13

The third digit (in the case of errors marked with the letter P) identifies the specific system or subsystem where the problem is localized:
1. Air or fuel dosage;

2. Air or fuel dosage (only injector malfunctions);
3. Injection or ignition system;
4. Auxiliary emission control systems;
5. Speed and minimum speed control;
6. Output and computer circuits;
7. Transmission.

The **fourth** and **fifth** digits identify the system section that caused the failure.
There is no reference table, of course, for these digits because the number of components in each system or subsystem depends on the manufacturer.

Figure 119: Embedding of the error codes with the TEXA OBD Scan Tool

Figure 120: MIL light on a Ducati Multistrada 1200S DVT

4.7 Test and queries available

Icon	Name	Description	Test
	OBD Diagnosis	Assessment of board system readiness tests	OBD Diagnosis - Assessment of board system readiness tests
	OBD Diagnosis	Evaluation of Trouble Code and MIL status (*).	OBD Diagnosis: Evaluation of the fault code and of the status of the MIL
	Mode $01	Current Powertrain Engine Diagnostics Data	Mode $ 01 - Current diagnostic data related to the engine
	Mode $02	Freeze Frame related to the Powertrain System	Mode $ 02 - Frozen parameters related to the power train
	Mode $03	Emissions Trouble Code for the Power-train System	Mode $ 03 - DTCs related to the engine
	Mode $04	Emissions Clearing diagnosis information	Mode $ 04 - Clearing/reset of the diagnostic information related to emissions
	Mode $05	Oxygen Sensor Test Results	Mode $05 - Request the results of the tests on the oxygen sensors
	Mode $06	Results of the on-board test for systems NOT constantly monitored	Mode $ 06 - Request the on-board control test results for the specific systems monitored
	Mode $07	Fault codes request related to the emissions not yet approved	Mode $07 Request of fault codes related to emissions
	Mode $08	On Board System Check, Device Test	Mode $08 - Control of an on-board system, test or component
	Mode $09	Request Vehicle Information	Mode $09 − Request vehicle information

Table 14

4.7.1 OBD Diagnosis - Assessment of on-board system readiness tests

This Test gives us information on the systems fitted in the vehicles and the status of their operation:
- Response message in hexadecimal (readiness code).
- Bit train representing the supported services (0 if the service is not supported and 1 if the service is supported).
- Bit train representing the completed services (0 if the service is completed or not applicable and 1 if the service is not completed).
- Control unit address.
- Overall result from the assessment of the readiness test.
- Extended description of the readiness test.
- Readiness status test.

Figure 121

4.7.2 OBD Diagnosis: Evaluation of Trouble Code and MIL Status

Faults are stored on this page only if they have a negative impact on emissions. If the MIL is on and there are no errors in this page, you must query MODE $ 07 for the complete list of stored errors.

Figure 122

4.7.3 Mode $01 - Current Powertrain Engine Diagnostics Data

This function allows displaying the current parameters and states made available by the system.
The tool polls the control units to know which parameters and states are available for reading.
After selecting the parameters to display, press the PLAY button.

Figure 123: EOBD Scan Tool, Mode $01

Figure 124: Evaluation of the Parameters, Mode $ 01

4.7.4 Mode $02 - Freeze Frame related to the Powertrain System

This menu allows accessing the frozen parameters and states available in the control units.
A parameter or state is defined as "frozen" when it is acquired at the time of the error and is maintained over time. The tool polls the control units to know which parameters/states are available for reading. After selecting the parameters to display, press the PLAY button [▷].

4.7.5 Mode $03 - Emission Trouble Codes for the Powertrain System

This menu allows obtaining the DTC (Diagnostic Trouble Code) errors stored by the control unit.
If the DTCs listed are standard (not dependent on the manufacturer), the corresponding description is also displayed.

Figure 125: DTC Error List Mode $ 03

To activate the continuous reading of the values, check the box "**Repeat the reading of values cyclically**".

4.7.6 Mode $04 - Emission Clearing diagnosis information

If this menu is on "ACTIVE mode" it allows clearing the errors stored by the EOBD system.
The vehicle control units respond to this service with the ignition key on ON and the engine off.

Figure 126: Error Clearing Mode $04

4.7.7 Mode $05 - Oxygen Sensor Test Results

If this function is on "ACTIVE mode" it allows viewing the results of the tests on the oxygen sensors.

4.7.8 Mode $06 - Results of the on-board test for systems NOT constantly monitored

If this function is on "ACTIVE mode" it allows displaying, in addition to the results of the oxygen sensor tests, the results of the on-board control tests for components or systems that are not monitored on a continuous basis such as the EGR valve, evaporation system, etc.
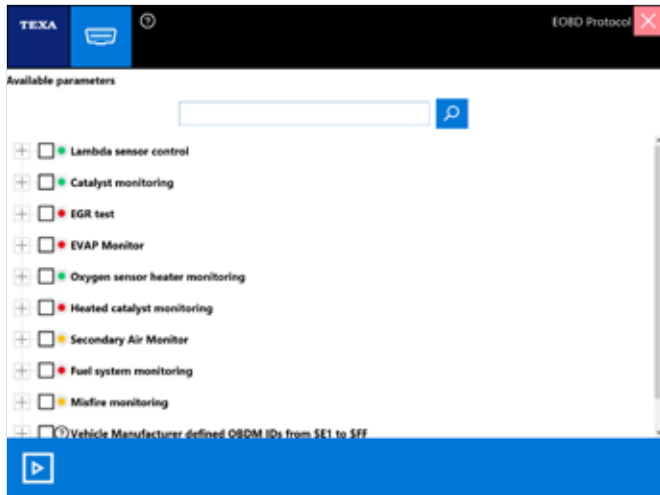
Figure 127: Selection of the parameters for the Mode $06

Figure 128: Evaluation of the parameters for the Mode $06

4.7.9 Mode $07 - Results of the on-board test for systems constantly monitored

Displays the DTCs that have not yet triggered the MIL light ON.

Figure 129: DTC Error List Mode $ 07

4.7.10 Mode $08 - Control of an on-board system, component test

It allows performing TESTS to control the operation of a given component.
It can be compared to the "ACTIVATIONS" page of the conventional self-diagnosis.
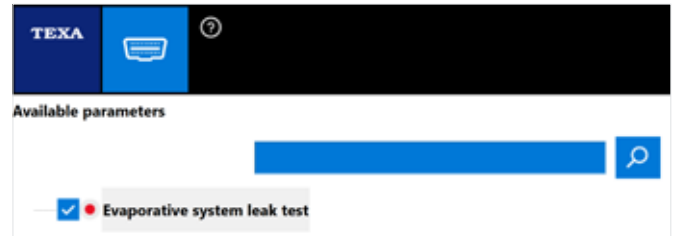
Figure 130: Modo $08

> **i** *This Service is ACTIVE according to the Manufacturer choice.*

4.7.11 Mode $09 - Request Vehicle Information

If this function is on "ACTIVE mode" it allows viewing specific vehicle information such as the Vehicle Identification Number (VIN), CALID (Calibration Identification Number), Software version installed on the control unit), etc.
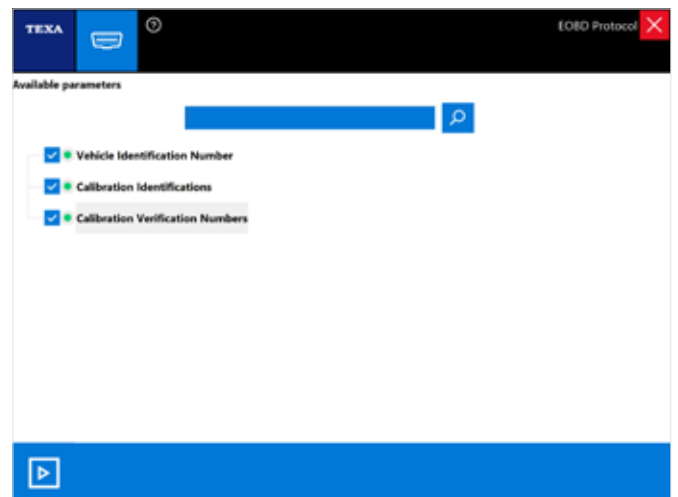
Figure 131: Parameters available for the Mode $ 09

Figure 132: Evaluation of the Parameters, Mode $ 09

It allows the participant to be confident in the diagnosis of the Euro 3 and Euro 4 electronic injection systems based on the parameters available through the diagnostic tool. Checking the carburetion with the exhaust gas analyzer. Practical tests with multimeter and oscilloscope on electronic injection vehicles with Marelli, Continental, Bosch or Mitsubishi control units.

5. RESET AND CODING

The "settings" available are many and differ from make to make and model to model.
However, we will explain as much as possible the procedures that will be useful also to understand better all the tests developed in the tool.

> ℹ️ *Be aware that some of the operations we are going to explain can be very important and relevant for the normal functionalities of the motorbike, therefore some knowledge is required in order to perform them according to the manufacturer's instructions.*

5.1 CO adjustment on Ducati motorcycles

Warm up the motorcycle to operating temperature (about 80-90 degrees), place the gas analyzer probes into the motorcycle's exhaust pipe and read the CO value on the analyzer's display.
Select the settings page on the self-diagnosis tool and select the CO Trimmer setting. Start the engine when required and set the
CO index by using the up/down arrows to increase and decrease and after checking the variation in the CO amount on the exhaust gas analyzer's display, confirm the changes.
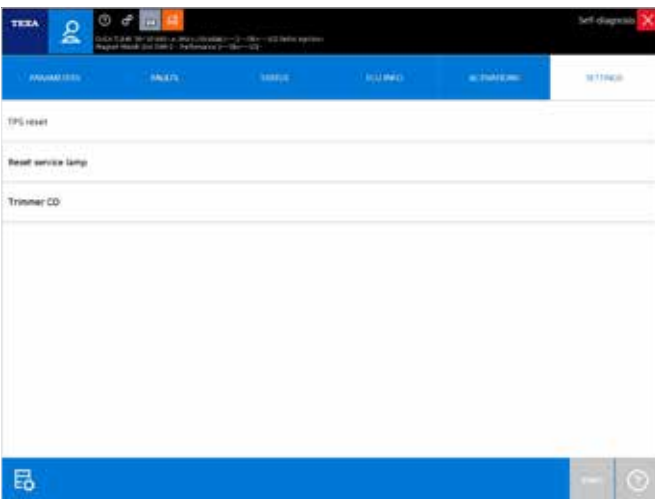
Figure 133: CO adjustment on 848s

Figure 134: Start the engine without switching off the Ignition

Figure 135: Leave the Throttle actuator at idle position
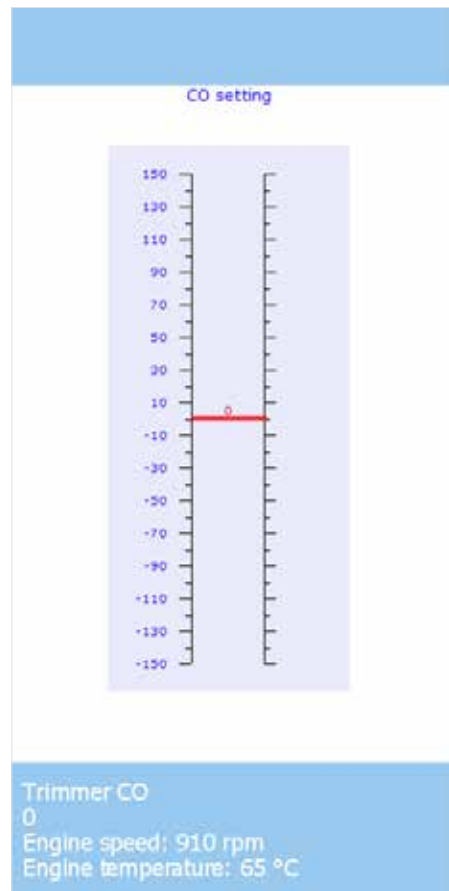
Figure 136: Indication of CO Trimmer variation

5.2 CO adjustment on Suzuki motorcycles

CO adjustment on Suzuki motorbikes is quite an advanced procedure, in fact the process is able to modify the injection time cylinder per cylinder and is very useful for keeping the mixture of the internal cylinders slightly fatter, so as to lower their combustion temperature.
It is also possible to change the injection times according to the opening of the throttle valve, i.e. for different engine load conditions. Obviously, an exhaust gas analyzer is always required in order to perform the procedure correctly.
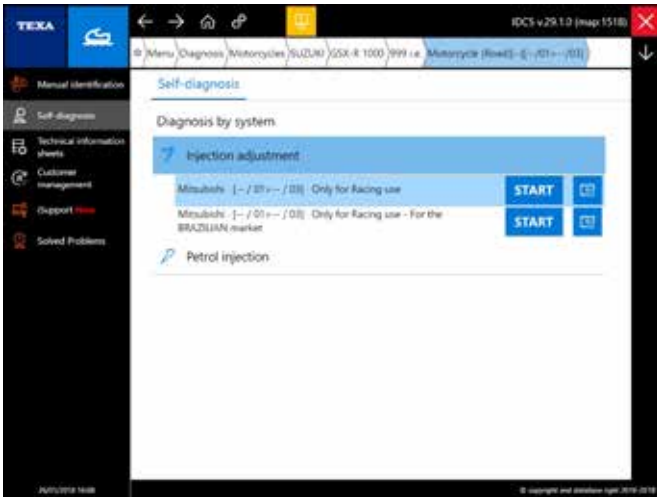
Figure 137: Injection system, settings

Select the INJECTION ADJUSTMENT section, choose whether to adjust the CO or the injection times for the engine load.
In the case of a CO adjustment, select which cylinder to change the injection times for.
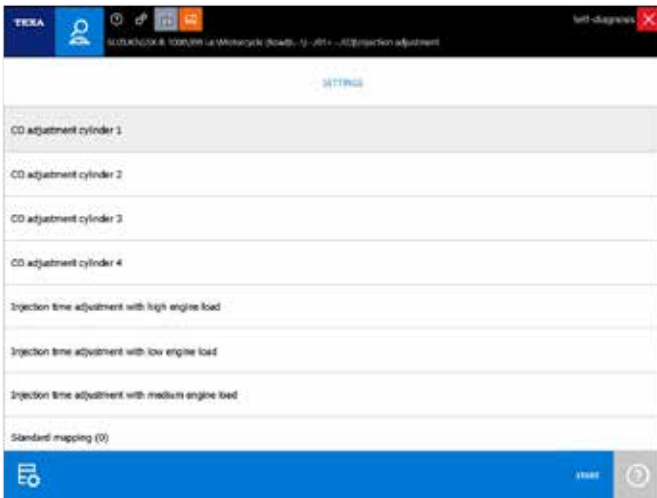
Figure 138: CO adjustment on Suzuki

Figure 139: Start the engine
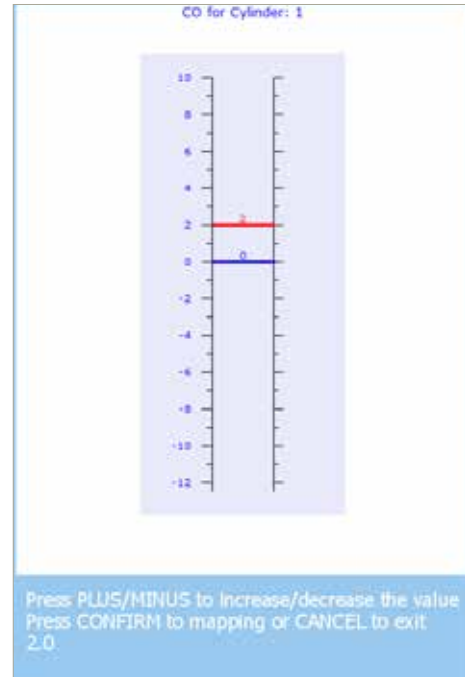
Figure 140: Indicator of the variation applied on the trimmer of the CO regulation

With each new self-diagnosis session, the starting value for the adjustment is always zero; this means that by confirming an adjustment of +5 points, this is stated until the self-diagnosis session is on.
Starting a new session on the same motorbike after an adjustment, the value will be automatically set to 0 for the same cylinder
which has just been modified, but the absolute CO will be at +5.
Therefore, it may be useful to keep note of the adjustments made. However, it is always possible to restore the original manufacturer mapping with the STANDARD MAPPING function.
Selecting the injection time adjustment gives the opportunity to set, by pressing the UP/DOWN arrows, the increase or decrease range of the injection time; once the engine load has been defined (Low-Medium-High) by the throttle position, with the +/- buttons the injection time will be increased or decreased by a percentage of + 10% or -10% with a step of 2.5 percentage points.
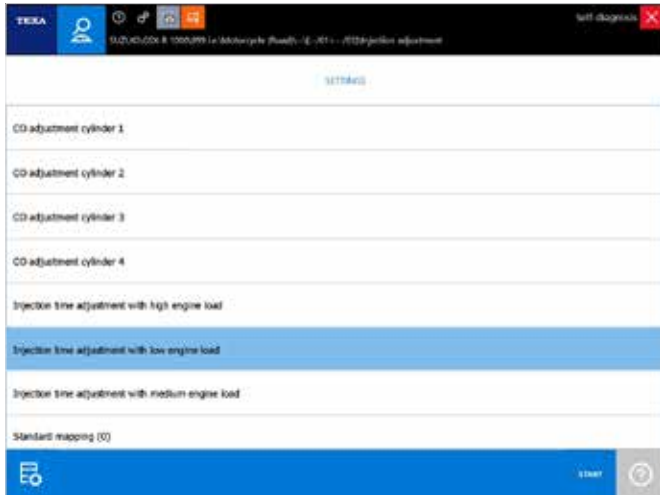
Figure 141: Example of Settings page on a Suzuki motorbike
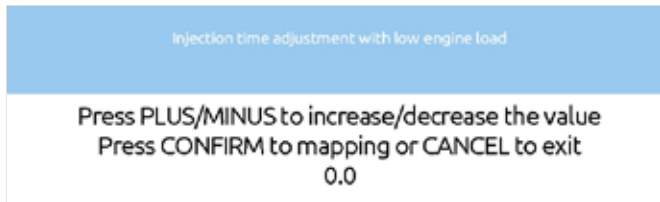
Figure 142: Injection time setting screen

5.3 Brake and suspension lock for Piaggio MP3

The latest version of the Piaggio scooter includes the activation of a parking brake and the locking of the front quadrilateral through electric actuators controlled by a special control unit.
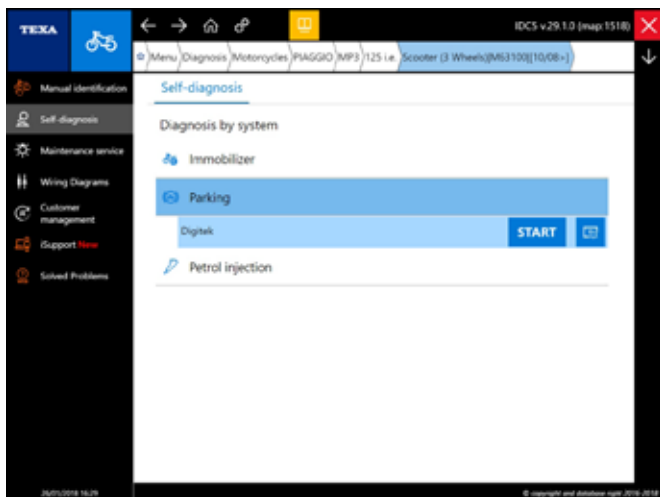
Figure 143: MP3 Lock activation
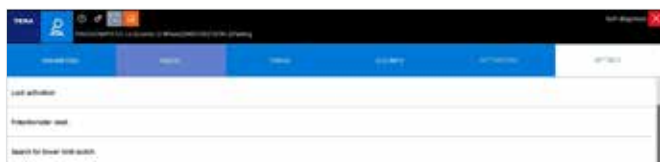
Figure 144: Settings available on MP3 including the Lock setting

5.4 Immobilizer unlock on a Ducati motorcycle

The Ducati immobilizer system (models until 2011), called Ducati Code, requires the Immobilizer ECU to read the specific Key code for each motorbike for the engine to be started.

If the code is incorrect or not acquired, the immobilizer unit does not transmit the start-up enable signal to the engine control unit, therefore it is obviously impossible to start the engine and the trouble code will be stored in the "IMMOBILIZER" ECU.

The correct self-diagnosis of the specific fault must be made from the status page that provides important information on the operation of the security system:
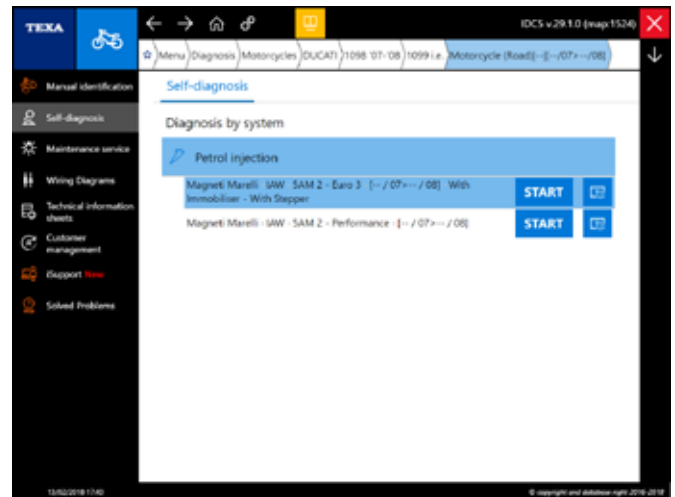
Figure 145: On motorbikes produced before M.Y. 2011 the immobilizer ECU is available in the engine self-diagnosis
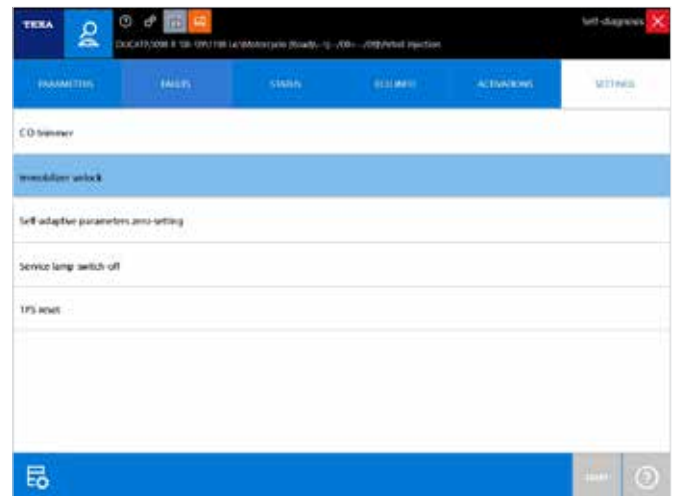
Figure 146: Immobilizer self-diagnosis working selections

5.5 Resetting and Learning Gears on a Ducati Multistrada 1200S/T

On a Ducati Multistrada 1200 S/T the gears must be reset when one of the following components is replaced:

- Gear Sensor
- Transmission assembly component.

Figure 147: Adjustment start

Figure 148

Figure 149

At the end of the procedure it is possible to follow the "Gear learning procedure" technical information sheet "Gear learning procedure" .
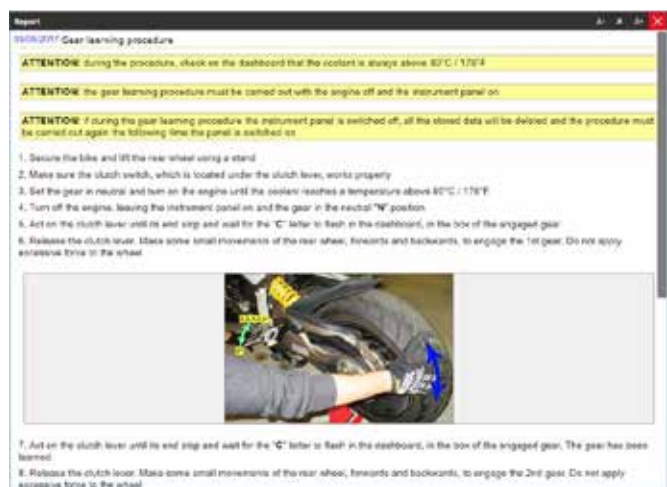
Figure 150

5.6 Configuration of BMW motorcycle heated handle grips

On BMW motorcycles heated handle grips can be installed, for which the ZFE chassis control unit must be reconfigured for them to work.
At the end of the enabling operation, the optional list in the various control units of the motorcycle will be updated with the optional code "Heated handle grips".
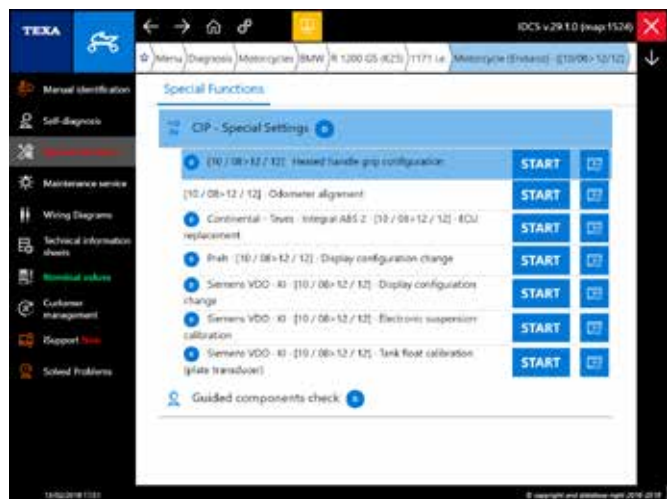
Figure 151: Selection of the working environment for configuring the heated handle grips

On the STATUS page, you can to check the current status of the enabling of the handle grips.
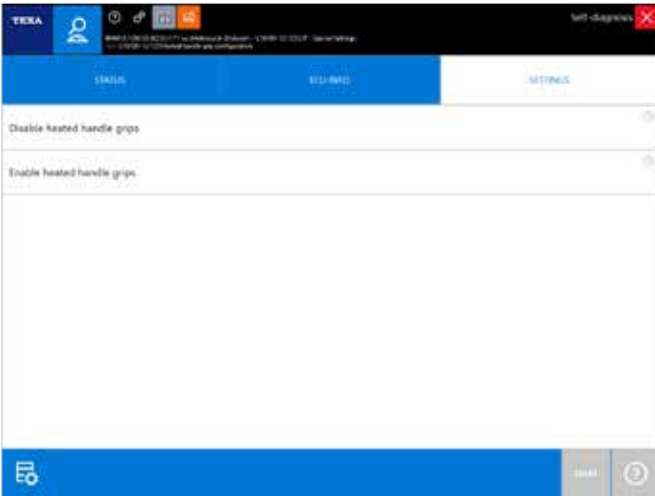
Figure 152: Enable/disable status of the heated handle grips

5.7 Configuration of the BMW display

In the BMW cluster (from 2006>) it is possible to change the various measuring units of distance, temperature
and the format of the clock, in addition to setting the internal date and time of the control unit that manages the cluster.
In the example in the figure, you can see the steps for setting the date on a Siemens VDO KI control unit.

Figure 153: Selections available in special CIP functions
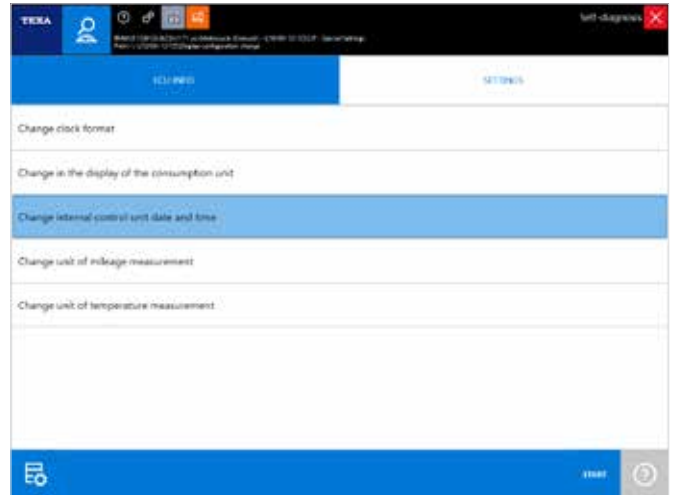
Figure 154: Date setting on BMW

In the ECU INFO page you can check the current configuration of the display.
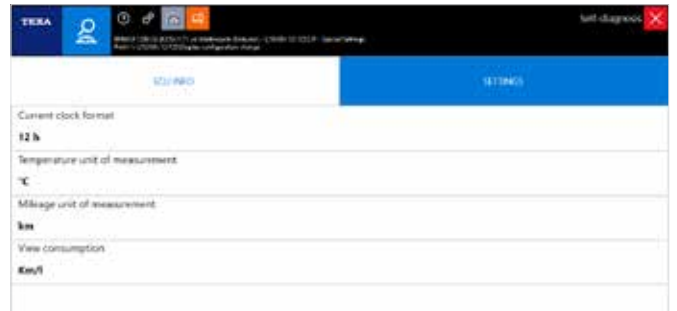
Figure 155: Info ECU page

5.8 BMW Total Mileage Alignment

On a modern BMW motorcycle, a fault could appear in the dashboard after one of the control unit is replaced. To solve this type of problem it is important to perform an alignment of the control unit.
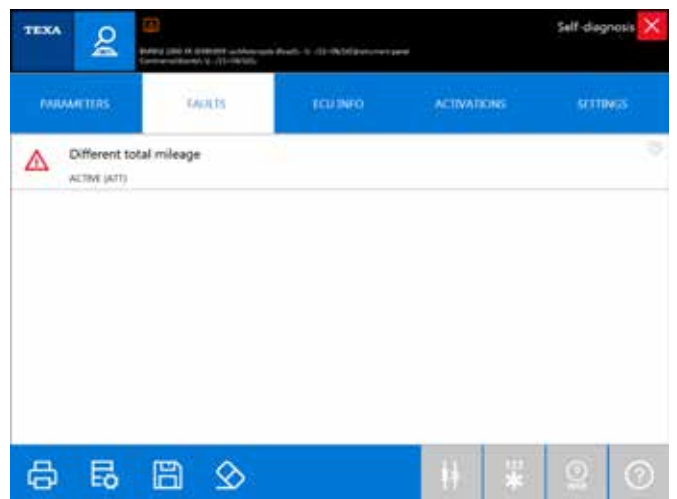
Figure 156: Error stored in the instrument panel after replacing the engine ECU

The fault shown in the example in figure 155 can be solved using the Special setting functions in the IDC5 software (Figure 156).
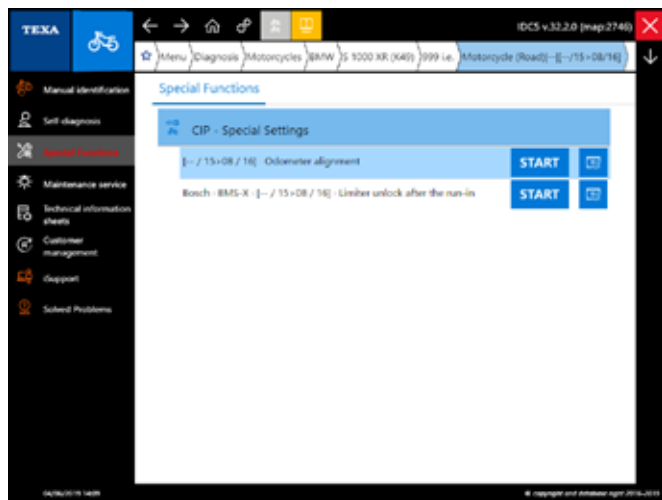
Figure 157: Selections available in special CIP functions

Figure 158

Figure 159: Adjustment start
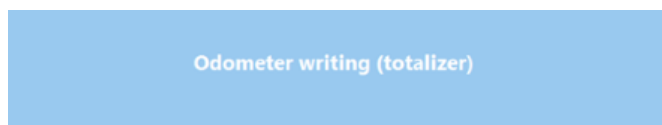
Figure 160: Adjustment completed

5.9 Sea Doo key coding

The software states the number of keys currently saved in the control unit and allows the user to code new ones.
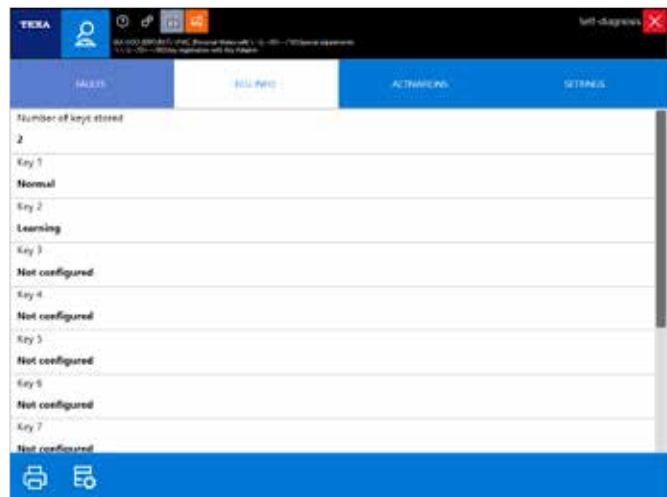
Figure 161: From the ECU INFO page you can see the programming status of the keys
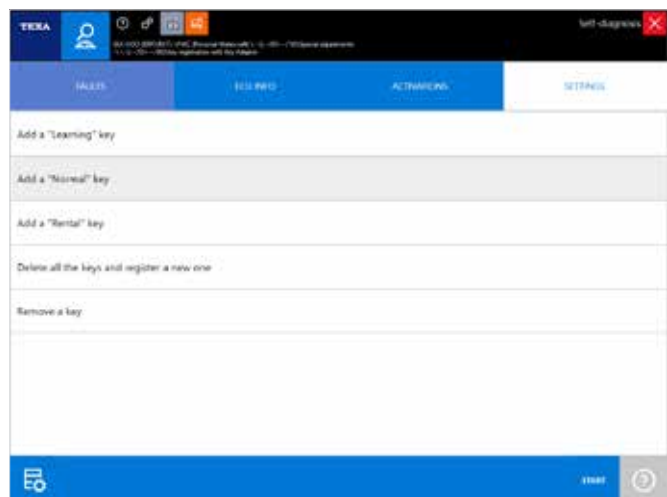
Figure 162: In the Settings page the different programming levels of the Sea Doo keys are available

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5.10 TPS reset on a Brutale 1090RR M.Y. 2013

This adjustment is intended to restore the Throttle valve opening to its original state.

Figure 163: Functions available listed in the Setting page
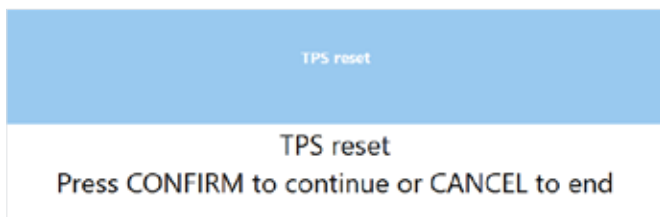
Figure 164: Reset step start

Figure 165: Start the process with the engine OFF

Figure 166: Reset completed
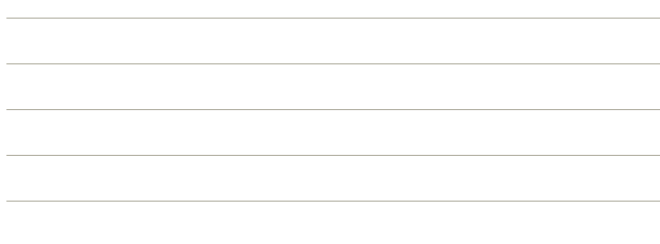
5.11 ABS coding on a Brutale 1090RR M.Y. 2013

This specific setting is intended to correctly set the ABS modules supplied as spare parts.

In fact, MV AGUSTA supplies ABS with a non-encoded coding to the ser
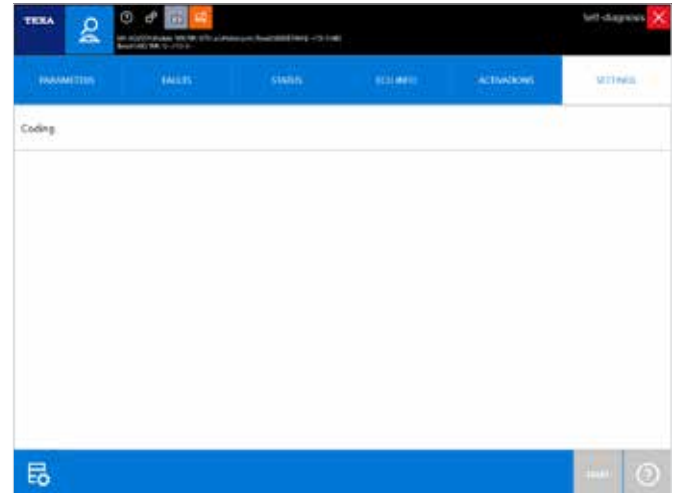
Figure 167: ABS coding function
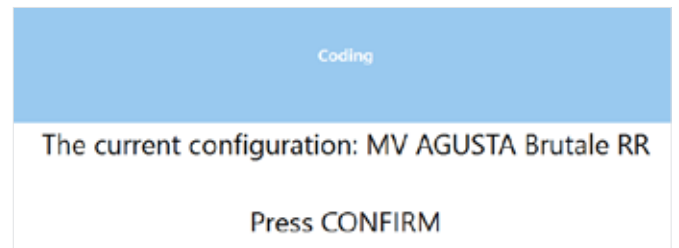
Figure 168: In the first stage of the operation the model saved in the ECU will be displayed
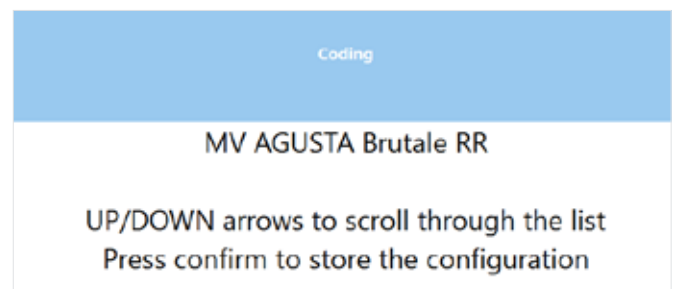
Figure 169: Using the up/down arrows you can select the model to store in the control unit
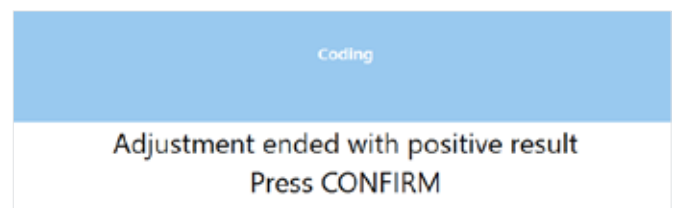
Figure 170: Procedure completed

5.12 Self-adaptive parameters reset on a Brutale 1090RR M.Y. 2013

This adjustment should be performed after each reprogramming.
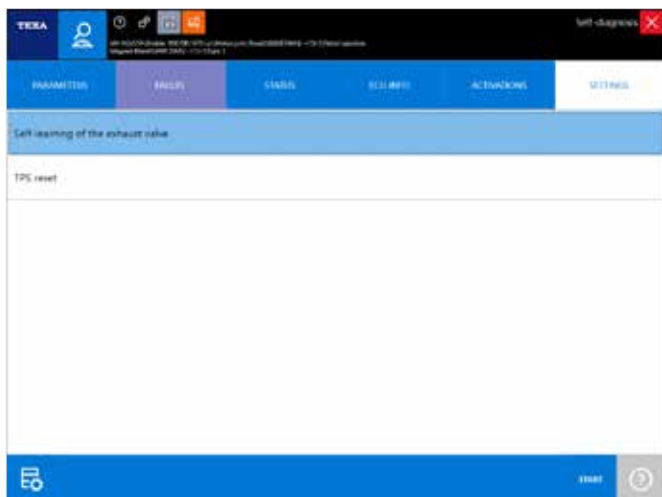
Figure 171
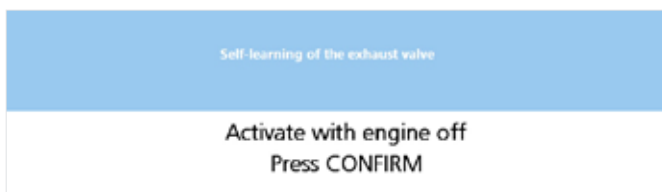
Figure 172: This specific setting needs to be perfomed with the engine OFF
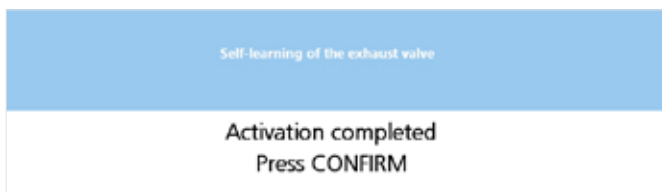
Figure 173:

5.13 Idle Adjustment on Harley Davidson motorcycles

One of the most requested requirement from Harley Davidson owners is to have a lower idle speed in order to have a specific sound for their motorcycle.
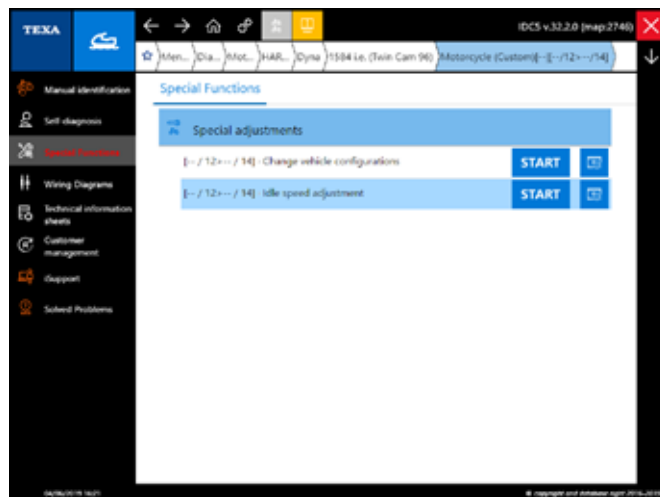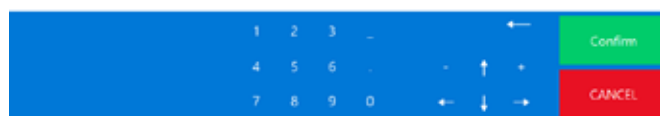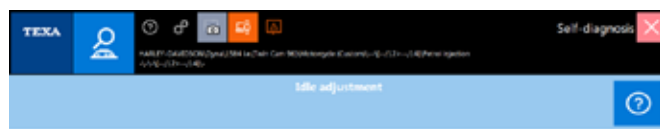

Figure 174: Selections available in special functions

Figure 175

In order to perform this setting, the bike has to be warmed up to its operating temperature (96 °C / 204 °F).

Figure 176: Interactive Dashboard

It is possible to set the desired value through the interactive dashboard as shown on Figure 172.

⚠️ **The SETTINGS functions have differences that depend on the manufacturers, the model and the electronic system.**

To check out the extensive coverage of TEXA products, go to: **www.texa.com/coverage**

To check on IDC5 compatibility and minimum system requirements, go to: **www.texa.com/system**

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