ANTI-THEFT SYSTEM EQUIPPED WITH A TRANSPONDER

Operating principle

Before carrying out any work on the transponder immobiliser, have the machine red key and black key to hand

Via an antenna located on the anti-theft contact switch, a key with a built-in transponder allows you to send an identification code that can unlock the ignition or injection ECU..

The system has its own diagnosis system by means of a tell-tale lamp on the instrument panel.

The diagnostis tell-tale lamp also has a deterrent function. When the ignition is off the tell-tale lamp flashes which indicates that the vehicle is protected by an anti-theft system..

Essential precautions

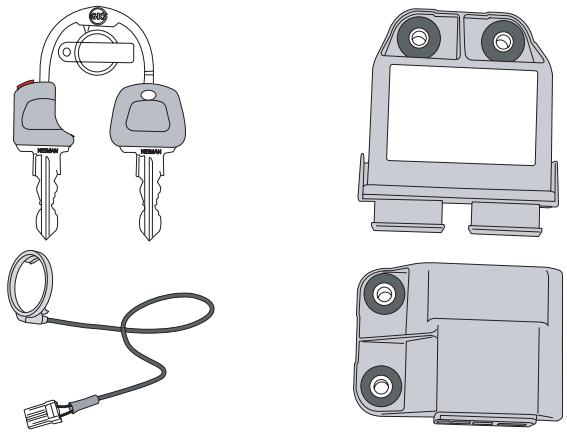
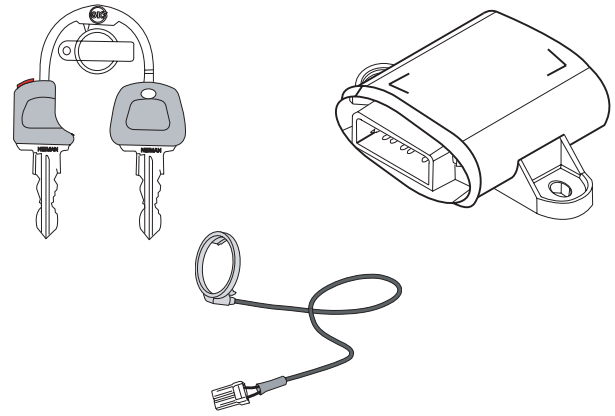
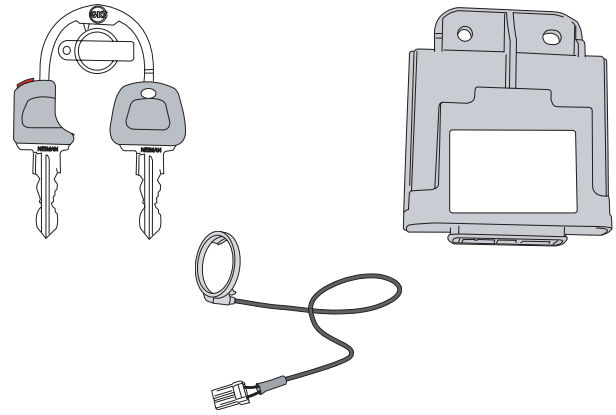
The use of a resistive suppressor and resistive spark plug is essential

- Nowadays, transponder-equipped anti-theft systems get out of order very rarely due to a defective transponder; most failures are related to an external cause, to misuse or to the key's improper data storage.
- Do not use a large metal key ring with the vehicle's key.
- Do not use the red key as the main user key because it shall be used only for storing data in the other keys.

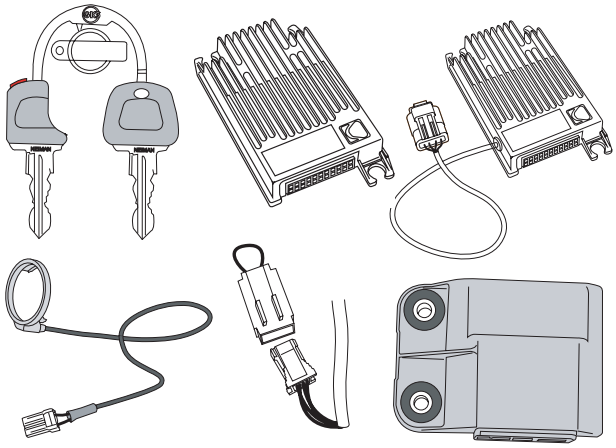
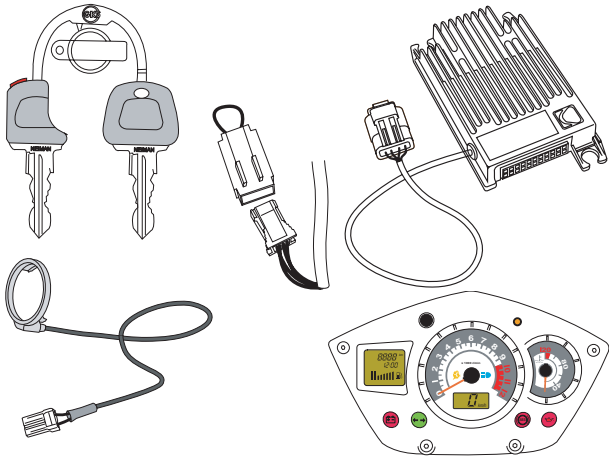
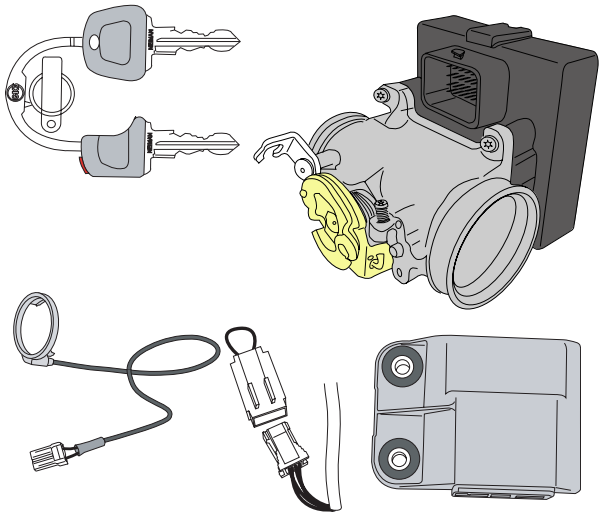
	Dealership	Spare parts	Mechanic 1	Mechanic 2	Mechanic 3
SIGN ATUR					

Applications

Spark ignition engine with carburettor:

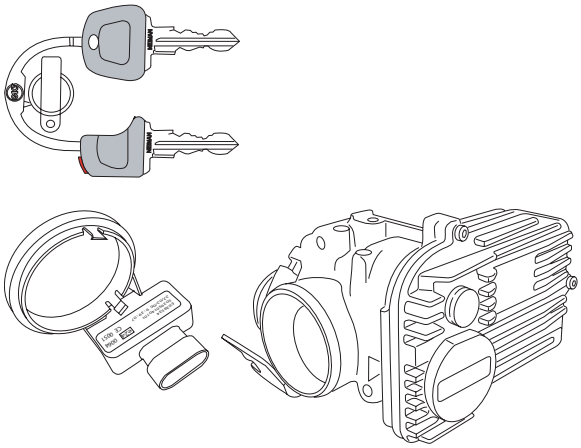
	**Ignition unit AEC400 related to the transponder module.** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 7 black keys Special features: Blank immobiliser module. The engine speed is restricted to 2000 rpm.
	**The ACI100 unit which features both functions: transponder-equipped ignition and anti-theft system** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 2 black keys Special features: Blank immobiliser module. The engine speed is restricted to 2000 rpm.
	**The ACI600 unit which features both functions: transponder-equipped ignition and anti-theft system** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 7 black keys Special features: The ACI600 unit controls the choke Blank immobiliser module. The engine speed is restricted to 2000 rpm.

Synerject injection engine:

	**An ignition and injection ECU related to a transponder module.** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 7 black keys Special features: It is the bridge provided on the diagnosis plug which provides the connection between the injection ECU and the immobiliser control unit. Blank ECU, after switching the ignition on 16 times is considered as being absent.
	**An ignition and injection ECU related to an instrument panel with a built in transponder.** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 7 black keys Special features: It is the bridge provided on the diagnosis plug which provides the connection between the injection ECU and the immobiliser control unit. Blank ECU, after switching the ignition on 16 times is considered as being absent.
	**An ignition and injection ECU related to a transponder module.** An antenna A "red" master key and a black key Immobiliser LED located on the instrument panel Number of keys that can store data: up to 7 black keys Special features: It is the bridge provided on the diagnosis plug which provides the connection between the injection ECU and the immobiliser control unit. Blank ECU, after switching the ignition on 255 times is considered as being absent.

Check that there is a jumper on the diagnostic plug.

Magneti Marelli injection engine:



An ignition and injection ECU which features the ignition, injection and transponder anti-theft functions.
An antenna
A "red" master key and a black key
Immobiliser LED located on the instrument panel
Number of keys that can store data: up to 7 black keys

Deterrent function

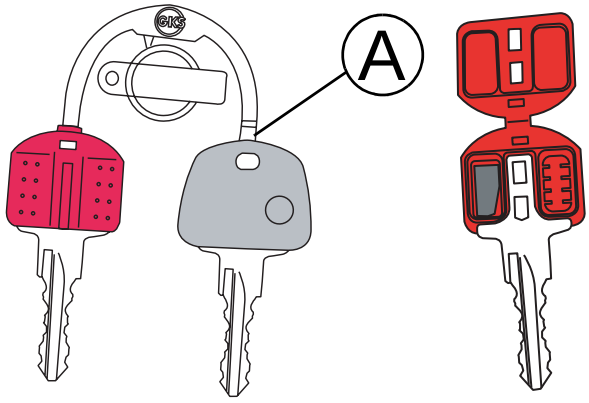
The diagnosis tell-tale lamp has the deterrent function.

When the ignition is off the tell-tale lamp flashes which indicates that the vehicle is protected by an anti-theft system..

To save the battery, the deterrent tell-tale lamp goes off if the vehicle is not used for over 48 hours.

The keys

The keys are specific as they feature an electronic component: the transponder with a unique code which allows you to identify the key.

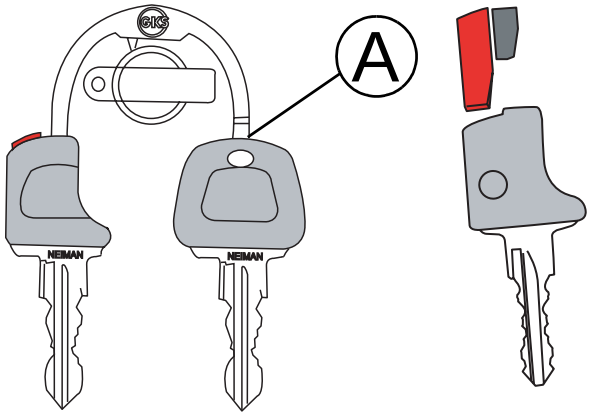


Former method

The transponder is built in the keys.

The "red key" can be dismantled in order to get the transponder.

When the vehicle is delivered to the customer, cut the key binder at (A) in order to keep the number plate on the "red" key.



New method

The transponder is built in the keys.

The "red" key has a demountable sliding tray to get the transponder.

When the vehicle is delivered to the customer, cut the key binder at (A) in order to keep the number plate on the "red" key.

In case you loose the "red key", you have to change all the components of the system.
Ignition switch
Immobiliser module / instrument panel
Ignition unit or injection unit

Storing data in the keys

Using the red key, set the ignition to on, and when the LED lights, turn off the ignition

Within a maximum of 15 seconds of cutting off the ignition with the red key, turn on the ignition with the black key, and when the LED comes on turn off the ignition.

Within a maximum of 15 seconds after switching off the ignition, switch on the ignition with the following black key, and when the LED comes on, switch off the ignition.

Repeat the operation with all the black keys to be programmed.

Within a maximum of 15 seconds of turning off the ignition with the last key memorised, turn on the ignition with the red key, and when the LED comes on, turn off the ignition.

Key memory check.

Using the red key, turn on the ignition, the LED on the instrument panel comes on for 0.5 seconds and flashes a number of times which corresponds to the number of keys which have been programmed, including the "red" key.

Diagnostic

A code system by lighting the diagnosis tell-tale lamp on the instrument panel has been provided in order to diagnose the system without dismantling it.

If the ignition indicator light remains on, it means that the immobiliser function is faulty.

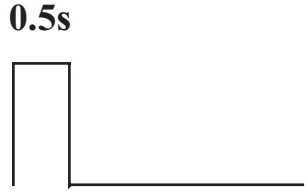
Before servicing the system:
Check that the keys used have been properly programmed. See chapter Checking the keys.P11
Check the code(s) sent by the diagnosis tell-tale lamp.

Switching on the ignition using the red key allows you to know the number of keys programmed.

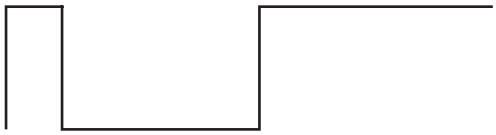
Using the red key, turn on the ignition, the LED on the instrument panel comes on for 0.5 seconds and flashes a number of times which corresponds to the number of keys which have been programmed, including the "red" key.

To obtain the diagnosis, switch on the ignition using the black key.
Check that the diagnostic plug jumper is fitted.

Spark ignition engine with carburettor AEC400:

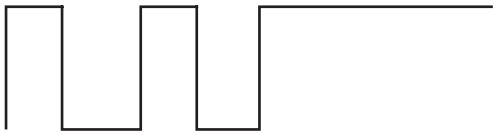


If the diagnosis LED goes on for only 0.5 second, it means that the system operates correctly.



If the diagnosis LED goes on for 0.5 second, and then if the LED stays on, it means that the black key and the immobiliser module do not belong to the vehicle.

- Although the key and the immobiliser module are matched, they belong to another vehicle.
- Programmed ECU coming from another vehicle.



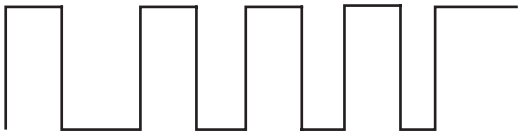
If the diagnosis LED goes on for 0.5 second, and if it is followed by 1 flash of 0.5 second, and then the LED stays on, it means that there is no connection between the immobiliser module and the ECU.

- No jumper on the diagnostic plug.
- Cut in the electric connection between the immobiliser module and the ECU.

If the diagnosis LED goes on for 0.5 second, and if it is followed by 2 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder is not detected by the system.

Cut between the antenna and the immobiliser unit or no transponder in the key.

- The key has no transponder.
- The key's transponder is defective.
- The antenna is incorrectly positioned.
- The antenna does not operate.



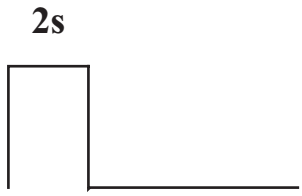
If the diagnosis LED goes on for 0.5 second, and if it is followed by 3 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder has been detected but it is not a programmed key.

Wrong key or immobiliser module coming from another vehicle.

- Key coming from another vehicle.
- Key not programmed.
- Immobiliser module coming from another vehicle.

If the diagnosis LED goes on for 0.5 second, and if it is followed by 4 flashes of 0.5 second, and then the LED stays on, it means that the immobiliser is blank.

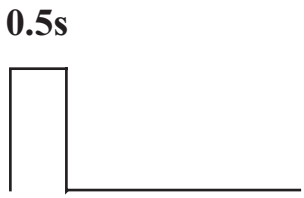
Store data in the keys. See chapter Storing data in the keys P5



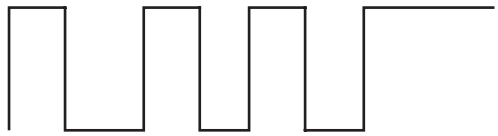
If the diagnosis LED goes on for only 2 seconds, it means that the system operates correctly but that the keys have never been programmed. (Blank immobiliser module and blank AEC400).

Store data in the keys. See chapter Storing data in the keys P5.

Spark ignition engine with carburettor ACI100:



If the diagnosis LED goes on for only 0.5 second, it means that the system operates correctly.



If the diagnosis LED goes on for 0.5 second, and if it is followed by 2 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder is not detected by the system.

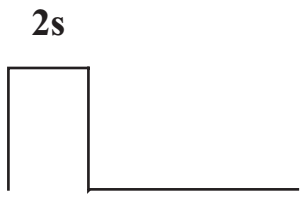
Cut between the antenna and the immobiliser unit or no transponder in the key.

- The key has no transponder.
- The key's transponder is defective.
- The antenna is incorrectly positioned.
- The antenna does not operate.

If the diagnosis LED goes on for 0.5 second, and if it is followed by 3 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder has been detected but it is not a programmed key.

Wrong key or immobiliser module coming from another vehicle.

- Key coming from another vehicle.
- Key not programmed.
- Immobiliser module coming from another vehicle.

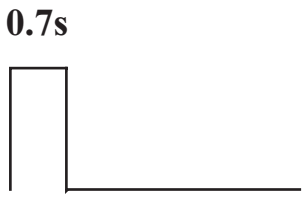


If the diagnosis LED goes on for only 2 seconds, it means that the system operates correctly but that the keys have never been programmed. (Blank immobiliser module and blank AEC400).

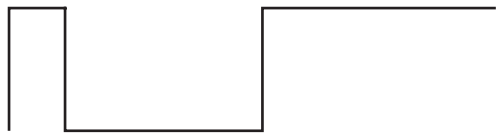
The engine speed is restricted to 2000 rpm.

Store data in the keys. See chapter Storing data in the keys P5.

Injection engine except for an immobiliser module built in the instrument panel

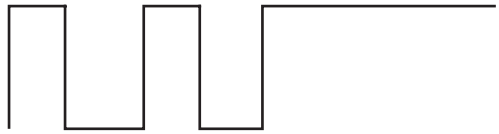


If the diagnosis LED goes on for only 0.7 second, it means that the system operates correctly.



If the diagnosis LED goes on for 0.7 second, and then if the LED stays on, it means that the black key and the immobiliser module do not belong to the vehicle.

- Although the key and the immobiliser module are matched, they belong to another vehicle.
- Programmed ECU coming from another vehicle.



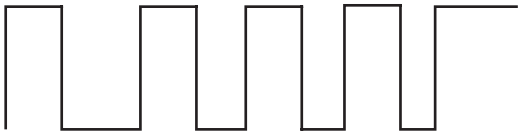
If the diagnosis LED goes on for 0.7 second, and if it is followed by 1 flash of 0.5 second, and then the LED stays on, it means that there is no connection between the immobiliser module and the ECU.

- No jumper on the diagnostic plug.
- Cut in the electric connection between the immobiliser module and the ECU.

If the diagnosis LED goes on for 0.7 second, and if it is followed by 2 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder is not detected by the system.

Cut between the antenna and the immobiliser unit or no transponder in the key.

- The key has no transponder.
- The key's transponder is defective.
- The antenna is incorrectly positioned.
- The antenna does not operate.



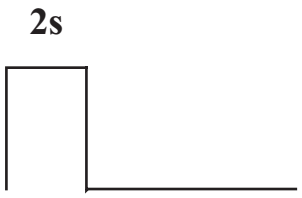
If the diagnosis LED goes on for 0.7 second, and if it is followed by 3 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder has been detected but it is not a programmed key.

Wrong key or immobiliser module coming from another vehicle.

- Key coming from another vehicle.
- Key not programmed.
- Immobiliser module coming from another vehicle.

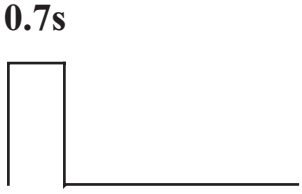
If the diagnosis LED goes on for 0.7 second, and if it is followed by 4 flashes of 0.5 second, and then the LED stays on, it means that the immobiliser is blank and that the ECU has been programmed. (Blank immobiliser module).

Store data in the keys. See chapter Storing data in the keys P5.



If the diagnosis LED goes on for only 2 seconds, it means that the system operates correctly but that the keys have never been programmed. (Immobiliser module and ECU blank).

Store data in the keys. See chapter Storing data in the keys P5.



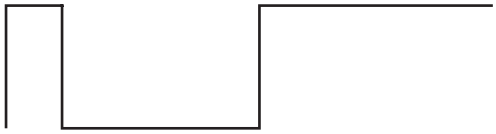
If the diagnosis LED goes on for only 0.7 second, it means that the immobiliser module has been programmed but that the ECU is blank.

The vehicle cannot start with the jumper.

The vehicle starts without the jumper.

Refit the jumper.

Switch on the ignition using the red key to program the injection ECU.



If the diagnosis LED goes on for 0.7 second, and then if the LED stays on, it means that the black key and the immobiliser module do not belong to the vehicle.

The engine starts without the jumper.

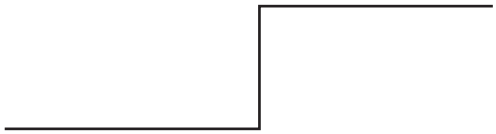
The engine cannot start with the jumper.

- Blank ECU, with 16 memorised switch on without diagnostic plug jumper. Injection Synerject M1 and M2.
- Blank ECU, with 255 memorised switch on without diagnostic plug jumper. Injection Synerject M3.

See chapter Special important points P11.

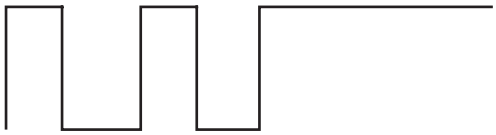
Injection engine and immobiliser built in the instrument panel.

If the diagnosis LED does not go on, it means that the system operates correctly.



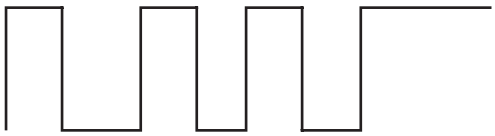
If the diagnosis LED does not go on, and then if the LED stays on, it means that the instrument panel is blank and that the ECU has been programmed.

Store data in the keys. See chapter Storing data in the keys P5.



If the diagnosis LED goes on for 1 second, and if it is followed by 1 flash of 0.5 second, and then the LED stays on, it means that there is no connection between the instrument panel and the ECU.

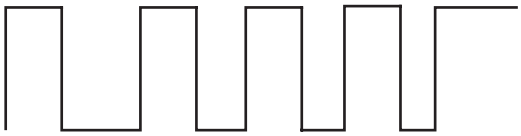
- No jumper on the diagnostic plug.
- Cut in the electric connection between the instrument panel and the ECU.



If the diagnosis LED goes on for 1 second, and if it is followed by 2 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder is not detected by the system.

Cut between the antenna and the instrument panel or no transponder in the key.

- The key has no transponder.
- The key's transponder is defective.
- The antenna is incorrectly positioned.
- The antenna does not operate.



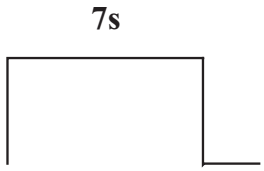
If the diagnosis LED goes on for 1 second, and if it is followed by 3 flashes of 0.5 second, and then the LED stays on, it means that the key's transponder has been detected but it is not a programmed key.

Wrong key or instrument panel coming from another vehicle.

- Key coming from another vehicle.
- Key not programmed.
- Instrument panel coming from another vehicle.

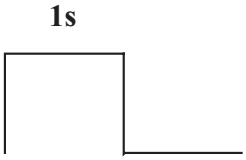
If the diagnosis LED goes on for 1 second, and if it is followed by 5 flashes of 0.5 second, and then the LED stays on, it means that the black key and the instrument panel do not belong to the vehicle.

- Although the key and the instrument panel are matched, they belong to another vehicle.
- Programmed ECU coming from another vehicle.



If the diagnosis LED goes on for only 7 seconds, it means that the keys have never been programmed. (Blank instrument panel and ECU).

Store data in the keys. See chapter Storing data in the keys P5.



If the diagnosis LED goes on for only 1 seconds, it means that the instrument panel has been programmed but that the ECU is blank.

The vehicle cannot start with the jumper.

The vehicle starts without the jumper.

Refit the jumper.

Switch on the ignition using the red key to program the injection ECU.

Special important points

- In case of a fault, do not use an immobiliser module or ECU from another machine to carry out tests. The keys, immobiliser module and ECU programmed on another machine form an assembly, are linked by a code and must under no circumstances be separated.
- If an ECU is changed without memorising the keys, do not turn on the ignition more than 16 times if the diagnostic jumper is disconnected as beyond this number, the ECU immobiliser function is erased. (Except for Synerject M3, switching the ignition on 255 times). A specific feature of the diagnostic tool allows you to retrieve the anti-starting function. Erasing "ADC flag". See workshop manual «Using the diagnostic tool» See chapter «Service functions».

Checking the system's components

Checking the antenna of the immobiliser.

Check that it is correctly positioned on the ignition key.

Check its resistance.

Synerject: R = 17Ω

Magneti Marelli: Cannot be measured.

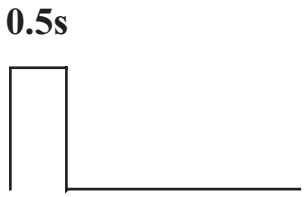
Checking the keys.

Red key:

Using the red key, turn on the ignition, the LED on the instrument panel comes on for 0.5 seconds and flashes a number of times which corresponds to the number of keys which have been programmed, including the "red" key.

The "red" key is the right one, and it is indeed the master key.

Black keys:



If the diagnosis LED goes on for only 0.5 second, it means that the system operates correctly.

The key is correct and has been programmed.

Checking the ignition and injection ECU.

Install a new ignition injection ECU.

WITHOUT the diagnostic plug jumper, start the engine with a black key.

If the vehicle operates, install the jumper, and switch on the ignition using the red key to program the ECU.

Checking the immobiliser module.

Immobiliser module, ACI100 module or instrument panel according to the model.

- Spark ignition engine with carburettor: ACI100

Install a new immobiliser module.

Switch on the ignition using a black key.

Start the engine.

The engine speed is restricted to 2000 rpm.

If the vehicle operates, store data in the keys. See chapter Storing data in the keys P5.

- Injection engine: immobilising module or instrument panel according to the model

Install a new immobiliser module.

Store data in the keys. See chapter Storing data in the keys P5.

Interchangeability

Adding or changing a black key.

Store data in the keys. See chapter Storing data in the keys P5.

Changing an ignition key. (Without loosing the "red" key)

After changing the ignition key, take the transponder from the old "red" key and fit it in the slide tray of the new "red" key as a replacement of the one delivered with the new key.

Make sure the antenna is properly positioned on the key-operated ignition switch.

Store data in the keys by using the new "red" key and the new black key(s). See chapter Storing data in the keys P5.

Changing an ignition key. (Further to the loss of a "red" key)

Change the key-operated ignition switch.

Make sure the antenna is properly positioned on the key-operated ignition switch.

Change the immobiliser module (immobiliser module, module ACI100, module ACI600 or instrument panel according to the model).

Change the ignition unit(unit AEC400, unit ACI100, unit ACI600, ignition / injection ECU according to the model).

Store data in the keys by using the new "red" key and the new black key(s). See chapter Storing data in the keys P5.

Remind the customer that the red key shall not be used as the usual.

Changing the immobiliser module

Immobiliser module, ACI100 module or instrument panel according to the model.
Changing the immobiliser module.
Store data in the keys. See chapter Storing data in the keys P5.

Changing the injection ECU

Change the ECU.
Check that the diagnostic plug jumper is fitted.
Switch on the ignition using the red key to program the injection ECU.