

MP48 ADVANCED-OBD

4 CYL. INJECTION CONTROL UNIT

INSTALLATION MANUAL


Technical specifications

Supply voltage	Vbat= 10÷16V
Operating temperature	-40÷105°C
Protection fuse	MAX 15A
Current absorption with the actuators disabled	Imax ≤ 0.5A
Current absorption in standby mode	Istandby ≤ 10 µA
Actuators managed	up to 4 injectors with the following characteristics: Imax= 6A, Vbat max= 16V
Wire output gas solenoid valves	Pmax= 25W, Imax= 2A (power and maximum current for each output with two outputs enabled) Pmax= 50W, Imax= 4A (power and maximum current with just one output enabled)

Where to install the control unit:

- FAR from any **WATER LEAKAGE**

- FAR from **EXCESSIVE HEAT SOURCES** (such as exhaust manifolds).

- FAR from **HIGH-VOLTAGE CABLES**.


Create efficient electrical connections without using any "POWER TAPS".
Properly insulated soldering is the most effective type of electrical connection.

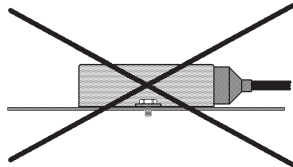
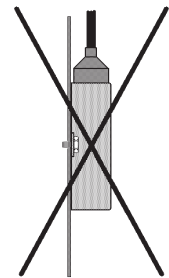


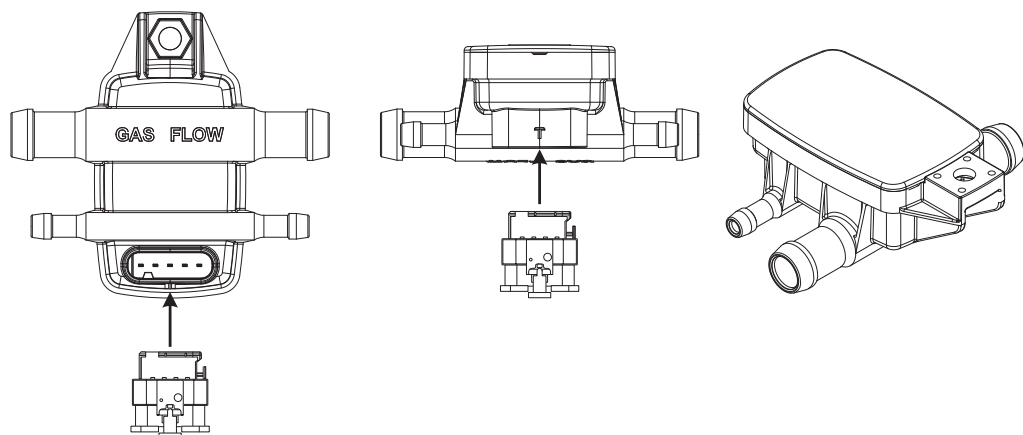
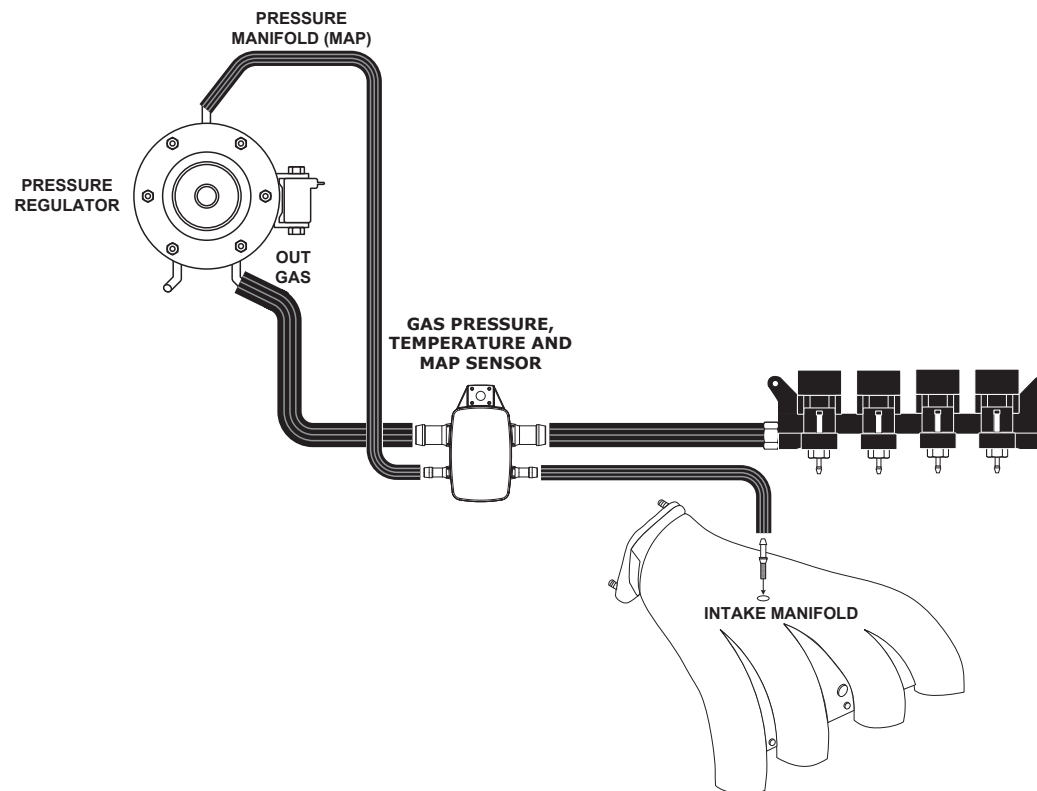
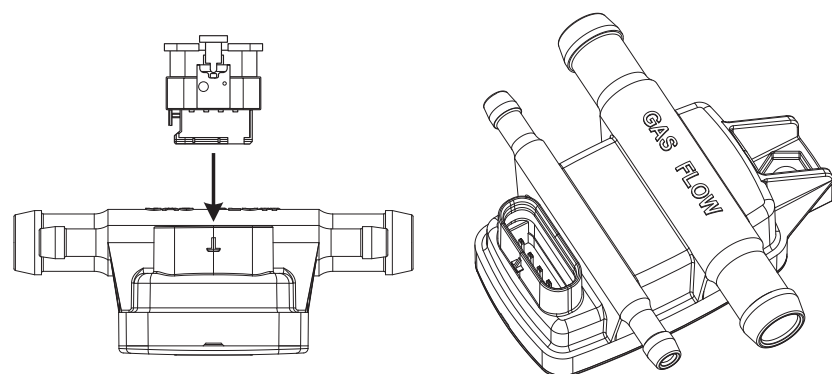
Advise the customer that if the **GAS system fuse burns**, the connections of the devices to which it is connected will be restored. It is strongly recommended not to replace the fuse with another one with a higher amperage rating since it may cause irreparable damage.

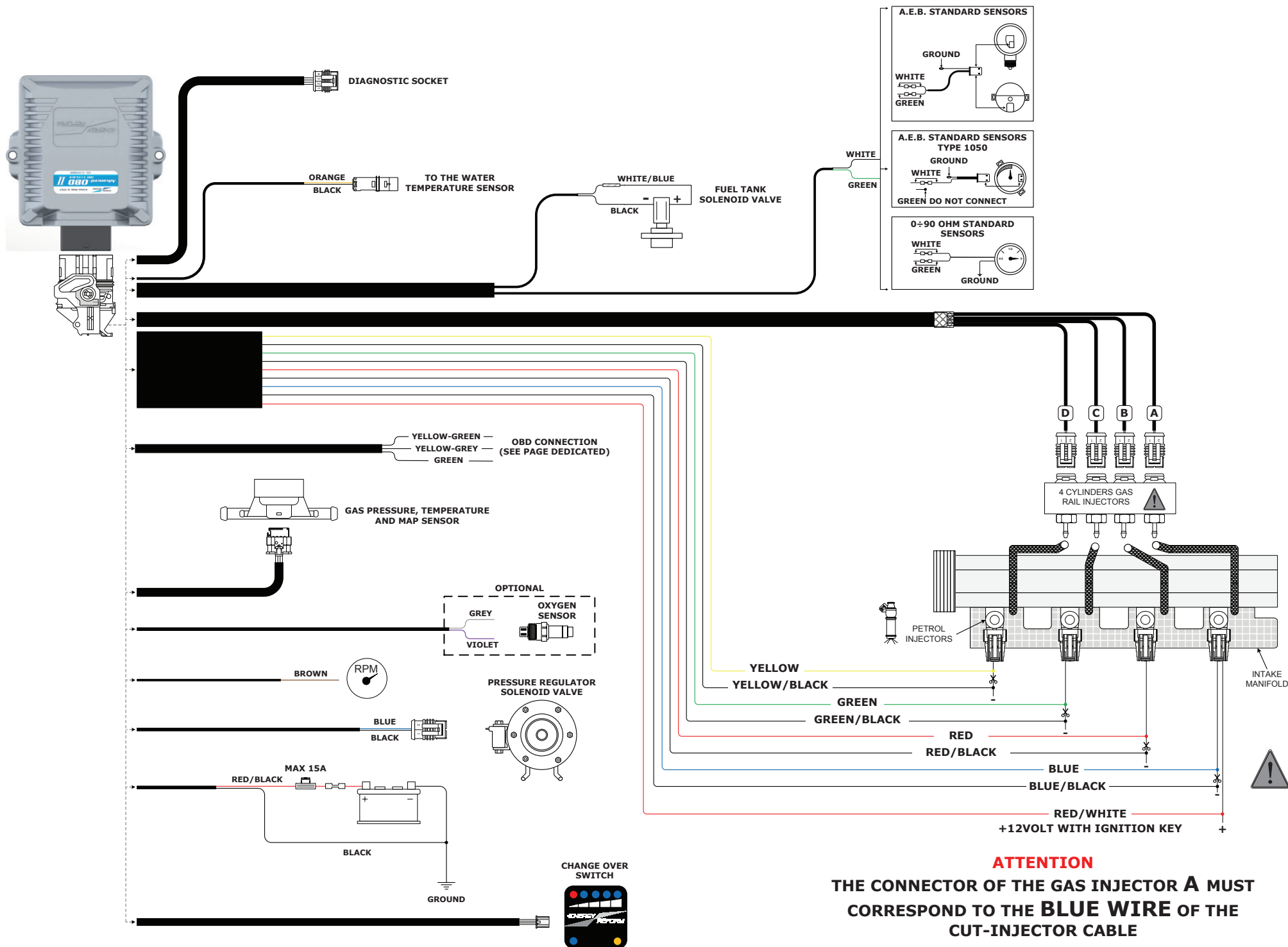


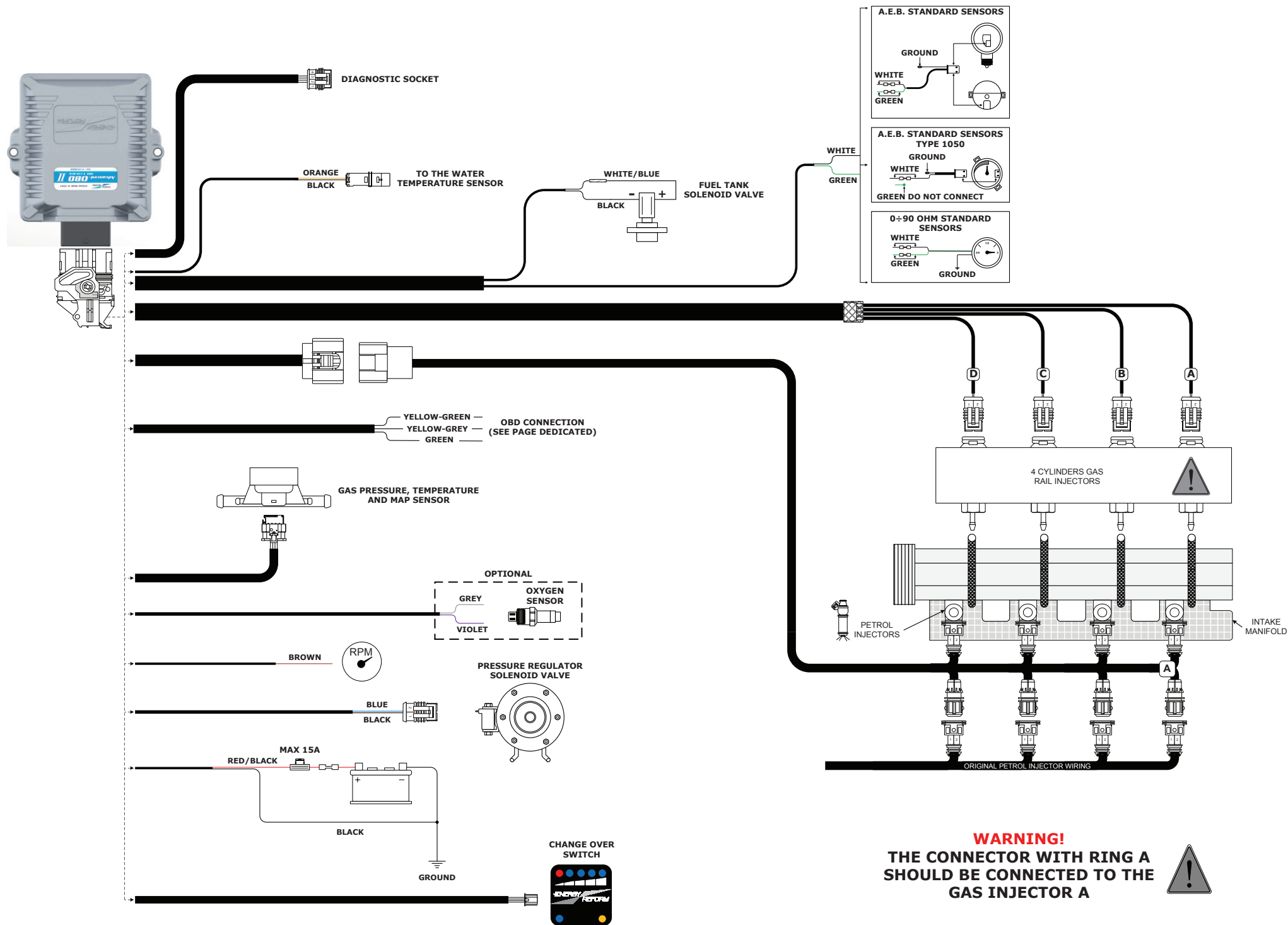
Do not open the Control Unit box for any reason, especially when the engine is running or the key is in the ignition, to avoid irreparable damage.
ENERGY REFORM will not be held responsible for damage to property or injuries to persons if unauthorised personnel tamper with its devices; such tampering will also invalidate the WARRANTY.

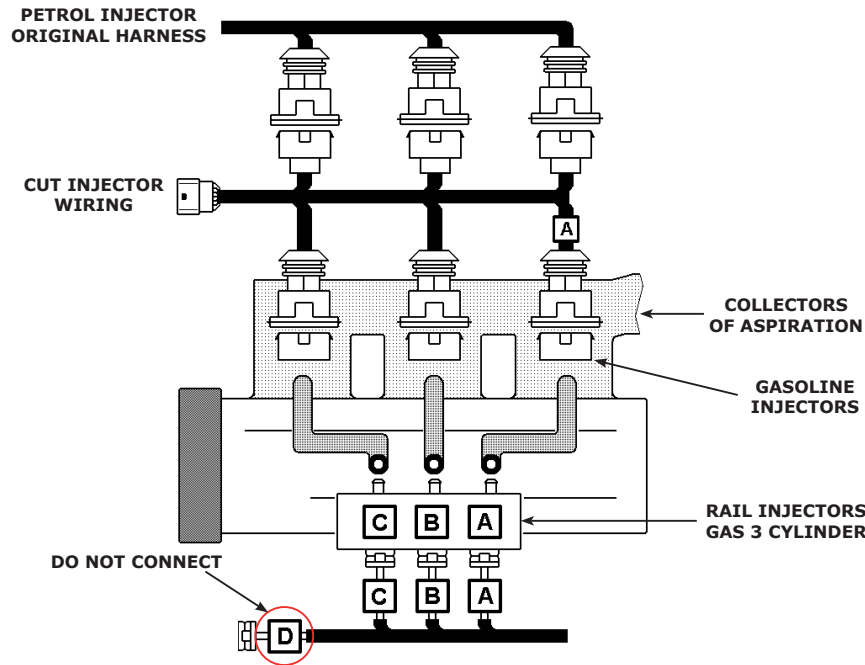
How to install the Control Unit

INCORRECT INSTALLATION	INCORRECT INSTALLATION	CORRECT INSTALLATION
		

OK**NO**







Through connection to the vehicle's OBD socket, this new generation of GAS control units makes it possible to acquire information useful for properly setting up the vehicle. Several carburetion parameters acquired from the PETROL control unit can be seen using the special software for connecting the GAS control unit to the PC, such as:

- Carburetion calibrators (Fast and Slow).
- Voltage on the rear lambda probe.

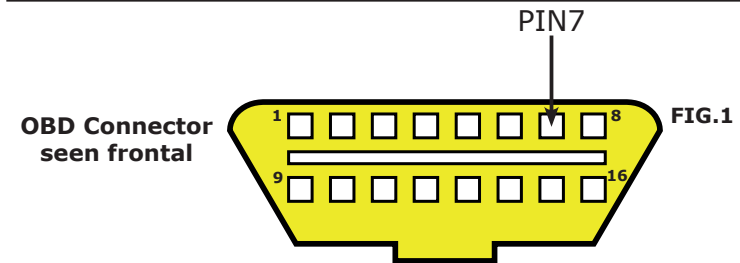
Connect a hand-held tester (CODE AEB214), and check the type of connection.

If the tester reads connection types 1,2, or 3, proceed by following the diagram in figure 1.

If the tester reads connection types 6,7,8 or 9, proceed by following the diagram in figure 2.

ATTENTION: If the tester (CODE AEB214) reads a type of connection that is not stated above, do not connect to any of the signals.

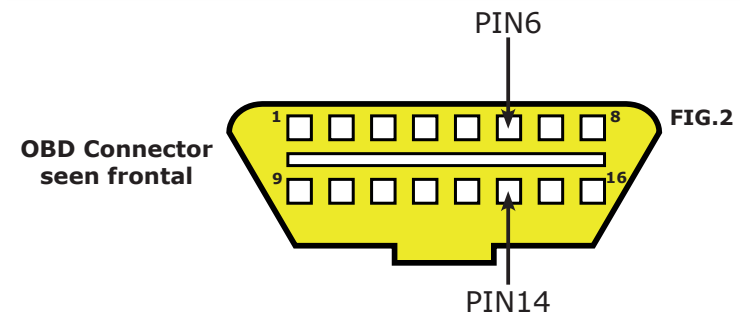
TYPE OF CONNECTION	CONNECTION DETAILS
Connection type 1	ISO 9141-2
Connection type 2	KWP-2000 Fast Init
Connection type 3	KWP-2000 Slow Init



Connect the GREEN wire to the signal found on PIN 7 of the OBD connector.

ATTENTION: The YELLOW-GREEN and YELLOW-GREY wires must be isolated and not connected.

TYPE OF CONNECTION	CONNECTION DETAILS
Connection type 6	CAN Standard 250 Kbps
Connection type 7	CAN Extended 250 Kbps
Connection type 8	CAN Standard 500 Kbps
Connection type 9	CAN Extended 500 Kbps



Connect the YELLOW-GREEN wire to the signal found on PIN 6 and the wire YELLOW-GREY to PIN 14 of the OBD connector.

ATTENTION: The GREEN wire must be isolated and not connected

How to check what cut injector wiring to use

There are different types of cut injector wiring to match with the injection control unit.

NOTE: the cut injector wiring must be ordered separately since it is not included in the kit.

To know what type of cut injector wiring to use, you must first check, on the petrol injector connector, on what PIN the injector positive is connected.

To identify which of the two wires is positive, do the following:

- detach all the connectors from the injectors;
- set a multimeter to measure DC voltage;
- put the negative probe to ground;
- put the positive probe into one of the two pins of the injector wiring;
- insert the key into the ignition and immediately check the multimeter reading.

If the multimeter reads +12 volts, that pin is the positive.

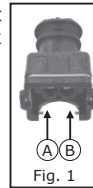
WARNING: the injector +12 volt on some cars might be timed; therefore the reading might disappear a few seconds after the ignition is turned on. Check the polarity of all injector wiring connectors to make sure that they are all polarised in the same way.

EXAMPLES OF CONNECTORS MOST COMMONLY USED**SA144 - SA144INV for 4-8 cylinder cars (For 8 cyl. use 2 types of wiring).**

Wiring types **SA144** and **SA144INV** are equipped with "BOSCH" type connectors to connect directly to the petrol injectors. To know whether to use model **SA144** or **SA144INV**, check the polarisation on the petrol injector wiring.

SA144: use this if the positive of the petrol injectors is on PIN A and the negative is on PIN B. Refer to figure 1.

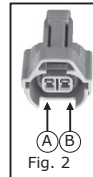
SA144INV: use this if the positive of the petrol injectors is on PIN B and the negative is on PIN A. Refer to figure 1.

**SA144J - SA144JINV - SA144SJ for 4-8 cylinder cars (For 8 cyl. use 2 types of wiring).**

Wiring types **SA144J** and **SA144JINV** are equipped with "JAPAN" type connectors to connect directly to the petrol injectors. To know whether to use model **SA144J** or **SA144JINV**, check the polarisation on the petrol injector wiring. **SA144J:** use this if the positive of the petrol injectors is on PIN A and the negative is on PIN B. Refer to figure 2.

SA144JINV: use this if the positive of the petrol injectors is on PIN B and the negative is on PIN A. Refer to figure 2.

Wiring type **SA144SJ** is equipped with JAPAN type pins and extended wiring for installation on SUBARU cars with a BOXER engine. It is used **ONLY** if the positive of the petrol injectors is on PIN B and the negative is on PIN A. Refer to figure 2.

**SA144E**

Wiring type **SA144E** is equipped with a single 6-pin connector. It can be used on some types of Fiat, Citroen or Peugeot cars that use the same connector on the injector wiring.

To install and to know on what cars it can be used, follow the instructions included with the wiring.

SA143 - SA143INV for 3 cylinder cars

Wiring types **SA143** and **SA143INV** are equipped with "BOSCH" type connectors to connect directly on the petrol injectors. To know whether to use model **SA143** or **SA143INV**, check the polarisation on the petrol injector wiring.

SA143: use this if the positive of the petrol injectors is on PIN A and the negative is on PIN B. Refer to figure 1.

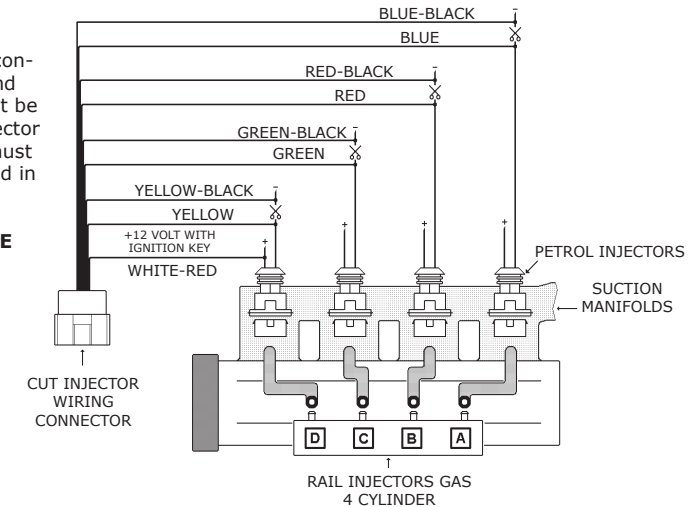
SA143INV: use this if the positive of the petrol injectors is on PIN B and the negative is on PIN A. Refer to figure 1.

SA144U

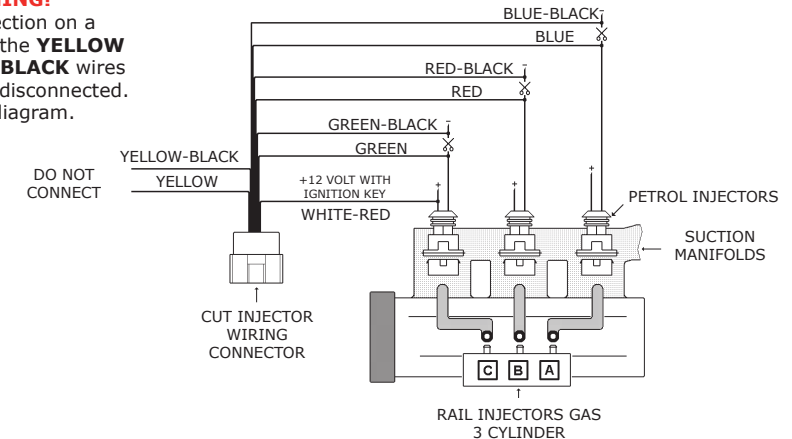
All wires of the **SA144U** wiring are free and without connectors. This wiring is used on cars where other types of wiring cannot be installed or where it is impossible to access the injectors' original connectors. To install this type of wiring, cut the negative wires of the petrol injectors in the order indicated in the figure. The connection direction is very important. The **BLACK striped** wires should be installed toward the petrol injection control unit and the others toward the injectors. The **WHITE-RED** wire should be connected to any of the injector positives.

Connection diagram for 4-cylinder cars**WARNING!**

Follow the sequence of connections. The **BLUE** and **BLUE-BLACK** wires must be positioned at the gas injector marked **A**. The others must be connected as indicated in the figure.

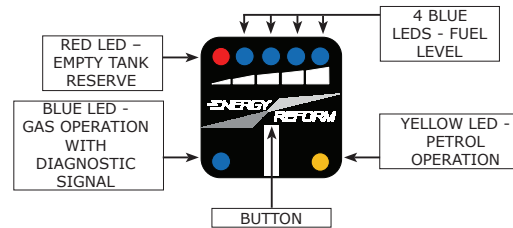
INTERRUPT THE INJECTOR NEGATIVE WIRES.**Connection diagram for 3-cylinder cars****WARNING!**

For a connection on a 3-cylinder car the **YELLOW** and **YELLOW-BLACK** wires should remain disconnected. See the diagram.



Operating description

The changeover switch supplied with the kit has one button, 7 LEDs and an internal buzzer.



BUTTON

This is used to select either the petrol or the gas fuel supply. Press the button one time to switch to gas and press it again to return to petrol.

BLUE LED FUNCTIONS

Rapid flashing – the control unit is prepared to start with petrol and switch automatically to GAS.

Steady on with yellow LED off – Gas operation.

RED LED + 4 BLUE LED FUNCTIONS

Fuel level indicator; reserve RED LED, while the 4 BLUE LEDS indicate the fuel level (1/4, 2/4, 3/4, 4/4). The indicator is illuminated only when the gas mode is selected.

YELLOW LED FUNCTIONS

Steady on with Blue LED off – PETROL operation.

Steady on with flashing Blue LED – the control unit is prepared to start with petrol and switch automatically to Gas.

LOW GAS PRESSURE PETROL CHANGEOVER

When the changeover switch indicates the fuel tank is in **reserve** and the gas pressure drops below a set value, the control unit automatically switches over to gas. This prevents the engine from running with an excessively lean carburetion, thus damaging the catalyser. Before returning to gas operation, fill up. The changeover switch signals the **changeover to petrol due to low gas pressure** by activating the internal buzzer, illuminating the YELLOW petrol operation LED and by illuminating the RED LED in an alternating pattern with the 4 BLUE LEDS. To make the changeover switch return to normal operation press the BUTTON one time; the YELLOW LED will remain on to indicate that the car is operating with petrol and the buzzer turns off.

EMERGENCY

If the car won't start with petrol (e.g. problems with the petrol pump, etc.), it can be started directly with GAS. To do this follow the instructions listed below:

- insert the ignition key and press the button to switch the changeover switch to gas operation;
- remove the key;
- insert the ignition key and keep pressing the button (about 5 seconds) until the BLUE LED stops flashing;
- now, start the engine without turning off the ignition key; the car will start directly with GAS;
- each time the car engine is turned off, the operation will have to be repeated to start in the EMERGENCY condition.

WARNING!

The EMERGENCY function can be activated only if the changeover switch is illuminated when the ignition key is turned