



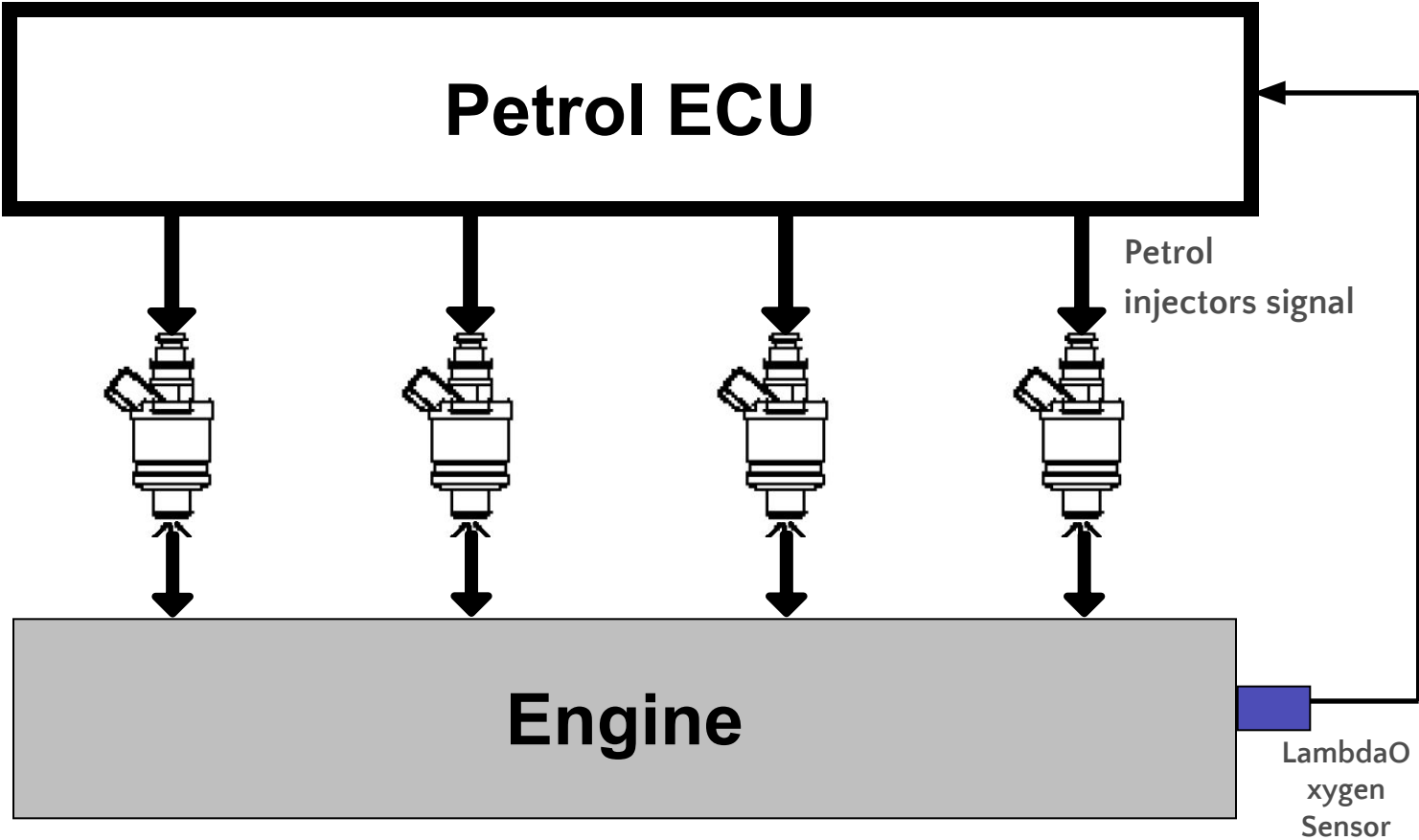
BRC GAS EQUIPMENT



Plug&Drive & *S24.11*

“Serial” Type Injection

Petrol Mode: Closed-Loop Condition

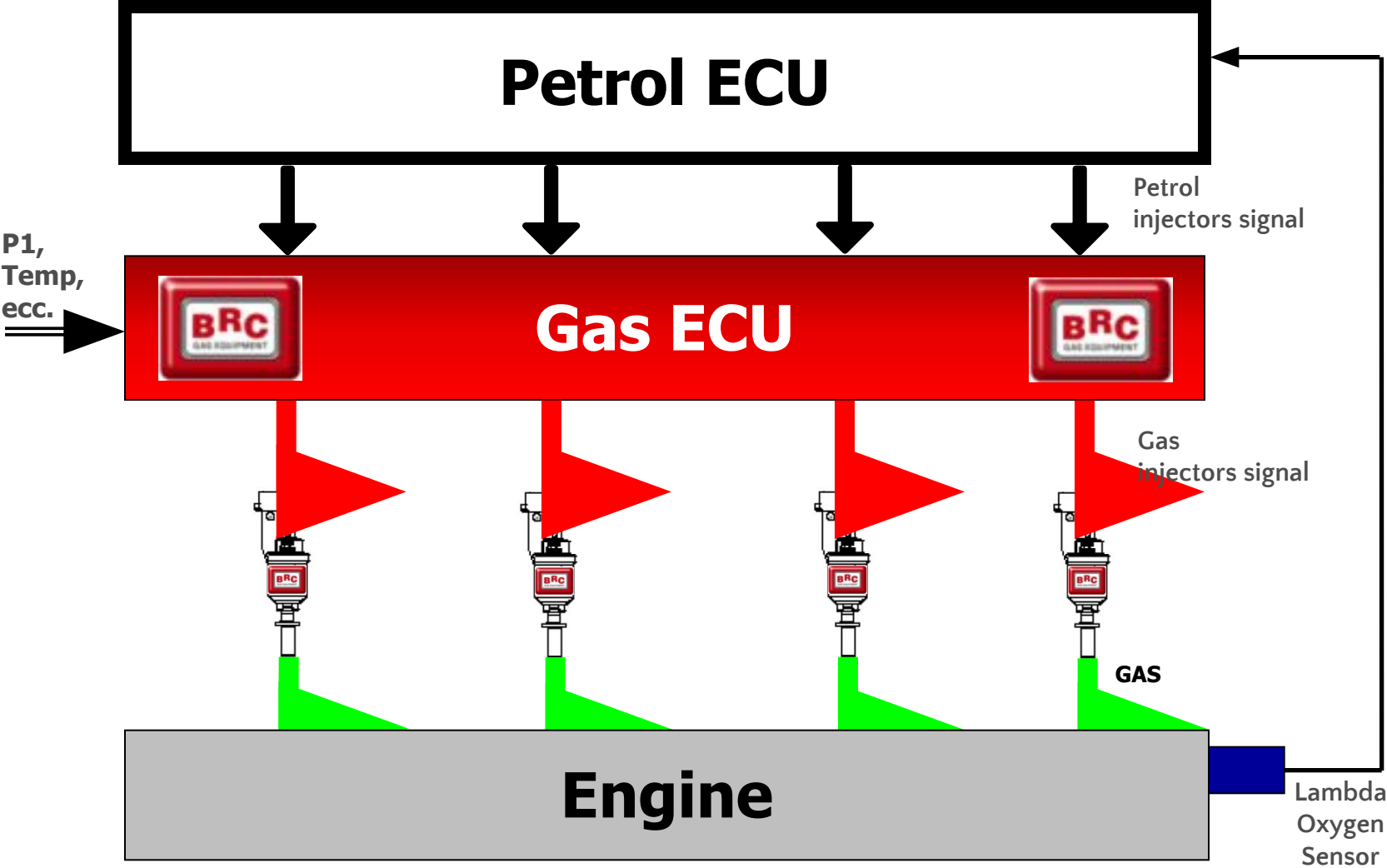




“Serial” Type Injection

BRC GAS EQUIPMENT

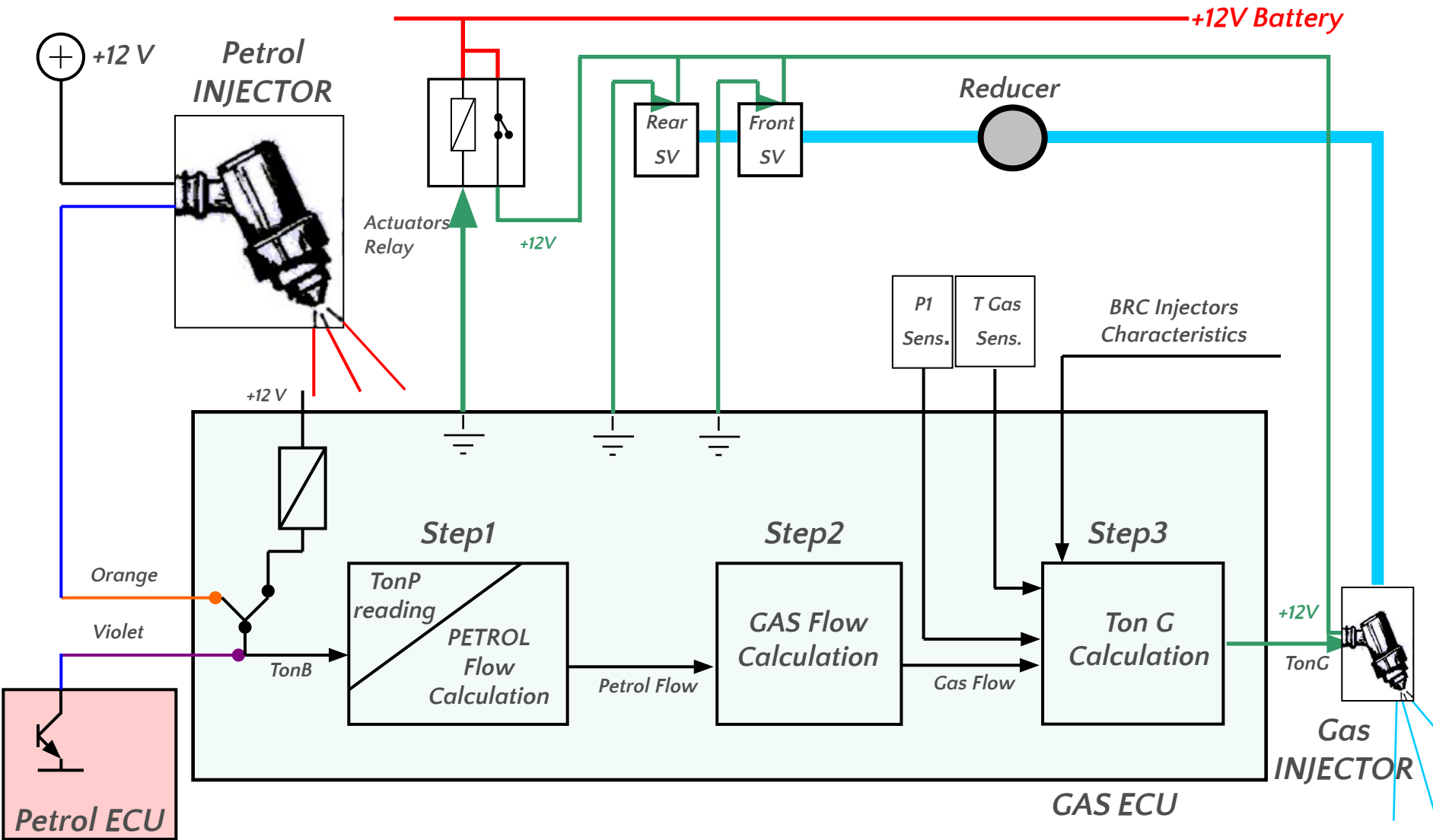
Closed Loop Condition





Injection: Calculation

BRC GAS EQUIPMENT

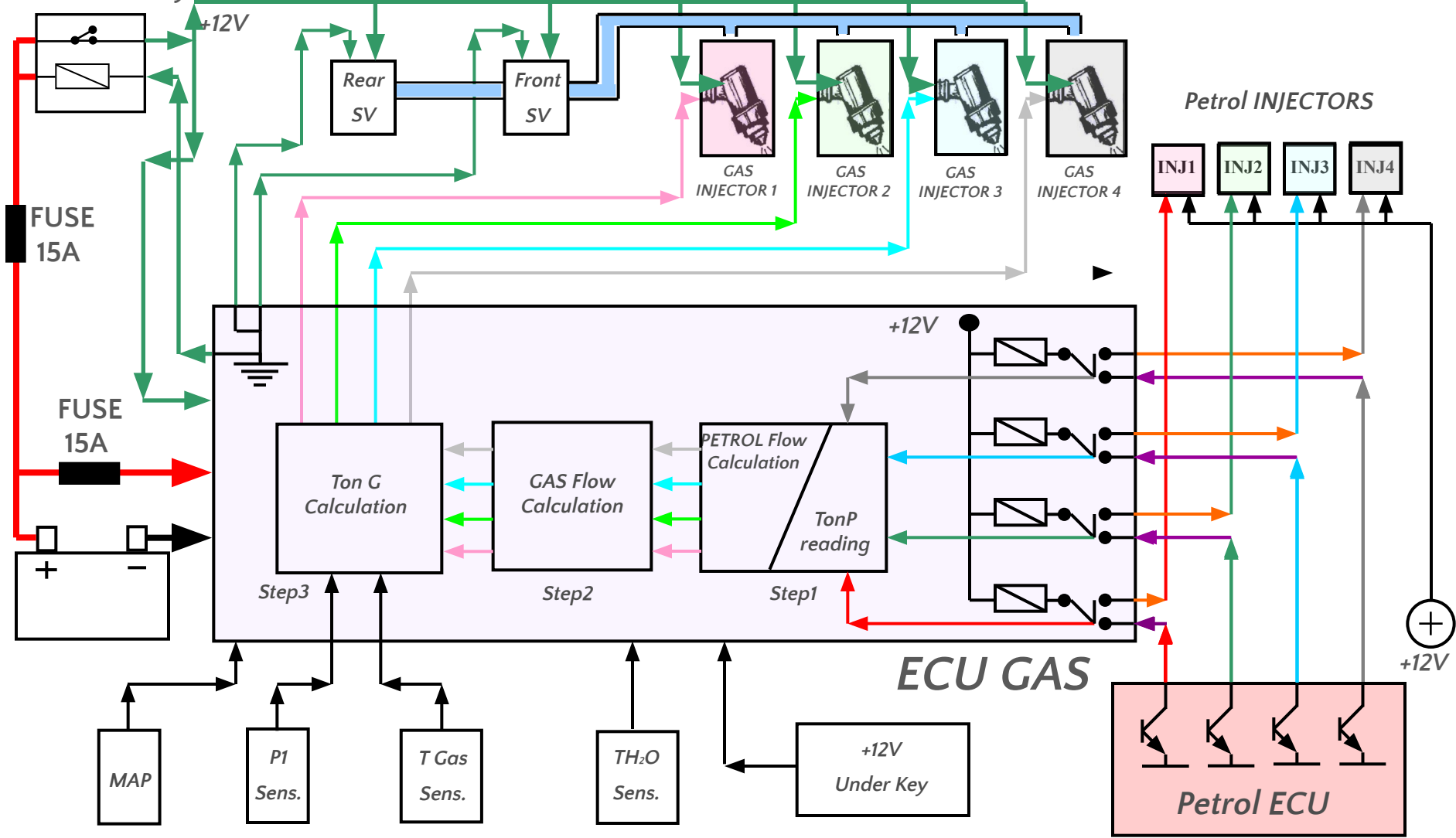




SEQUENT P&D SYSTEM

BRC GAS EQUIPMENT

Actuators Relay



In the new kit

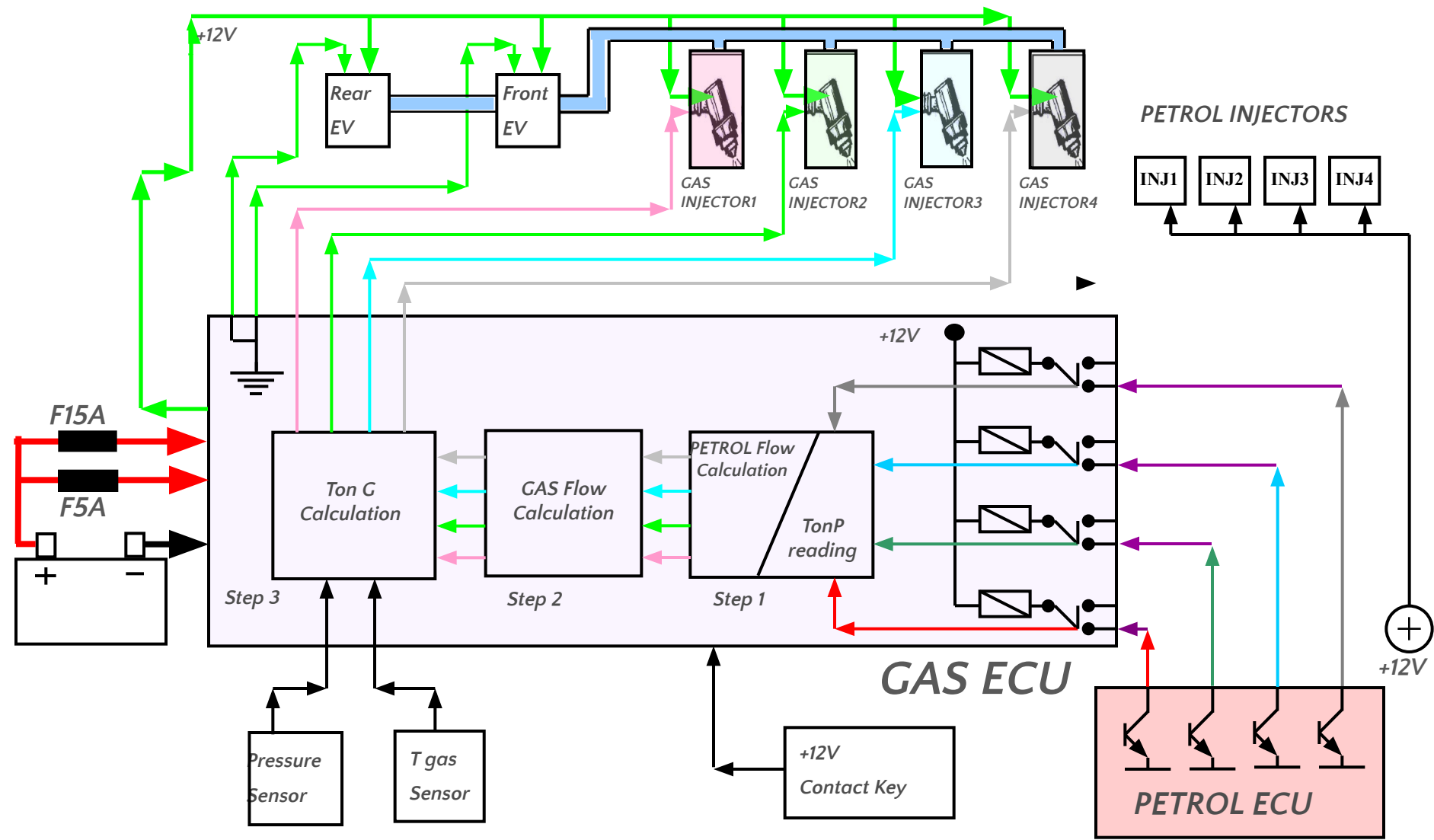
S24.11

*The actuator Relay is internal to
the Gas ECU*



Sequent 24 MY10.11

BRC GAS EQUIPMENT





The General Wiring Diagrams



Sequent Plug&Drive Kit

BRC GAS EQUIPMENT

P&D ECU



+

*Genius MB +
TH₂O Sensor*



+

*Rail +
PTS Sensata Sensor
(Brown)*



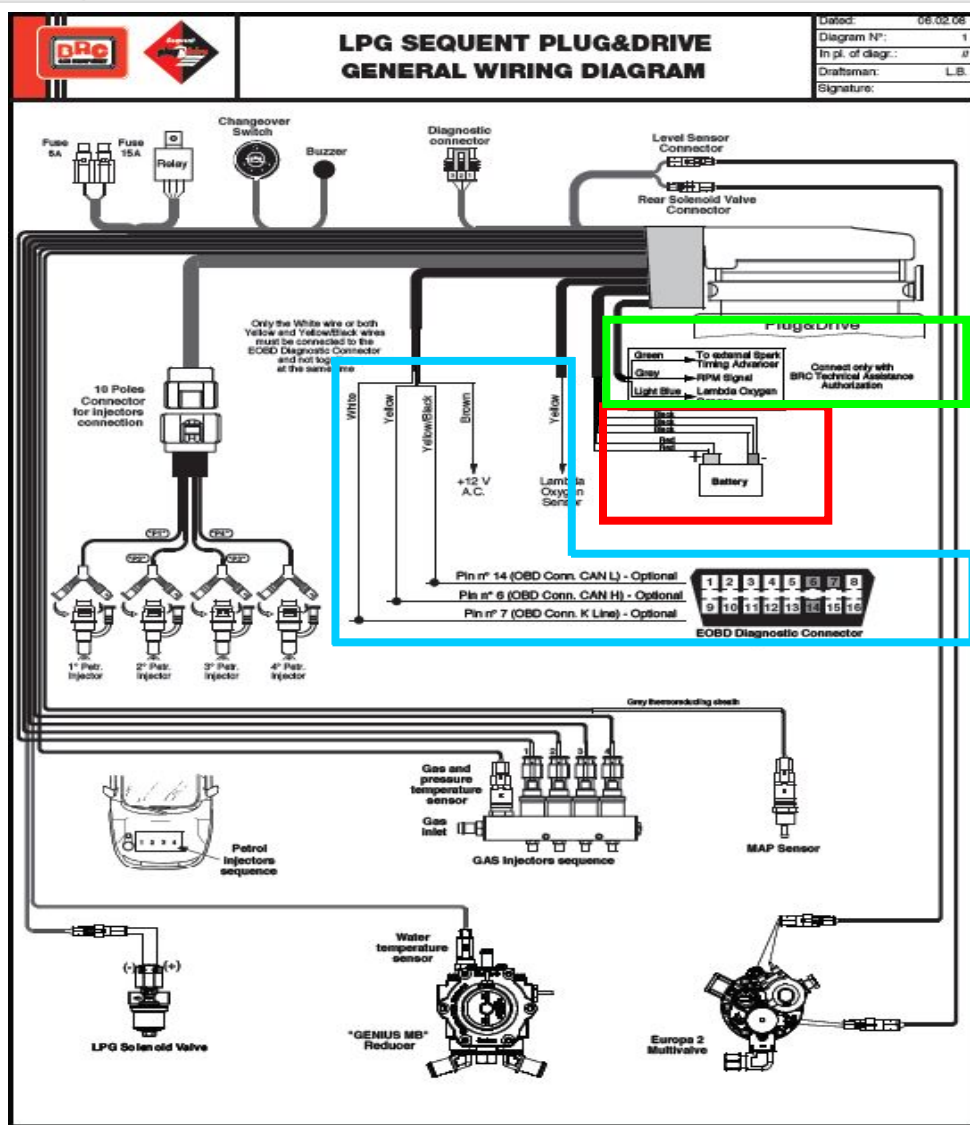
+

MAP Sensor



Plug&Drive System

BRC GAS EQUIPMENT



To Connect

- Power
- Ignition On

Optional

- Connection to OBD Plug depending on Type of Connection

Connection	6-7-8-9	1-2-3
Type	CAN BUS	K LINE
PIN	6 - 14	7

- Lambda Oxygen Sensor IN

"In Case of Need"

- Lambda Oxygen Sensor OUT
- External Timing Advancer (for CNG)
- RPM Signal



Sequent 24.11 Kit

BRC GAS EQUIPMENT

S24 MY10 ECU



+

*Genius MB
+
TH2O Sensor*



+

*Rail +
PTS Sensata Sensor
(Brown)*



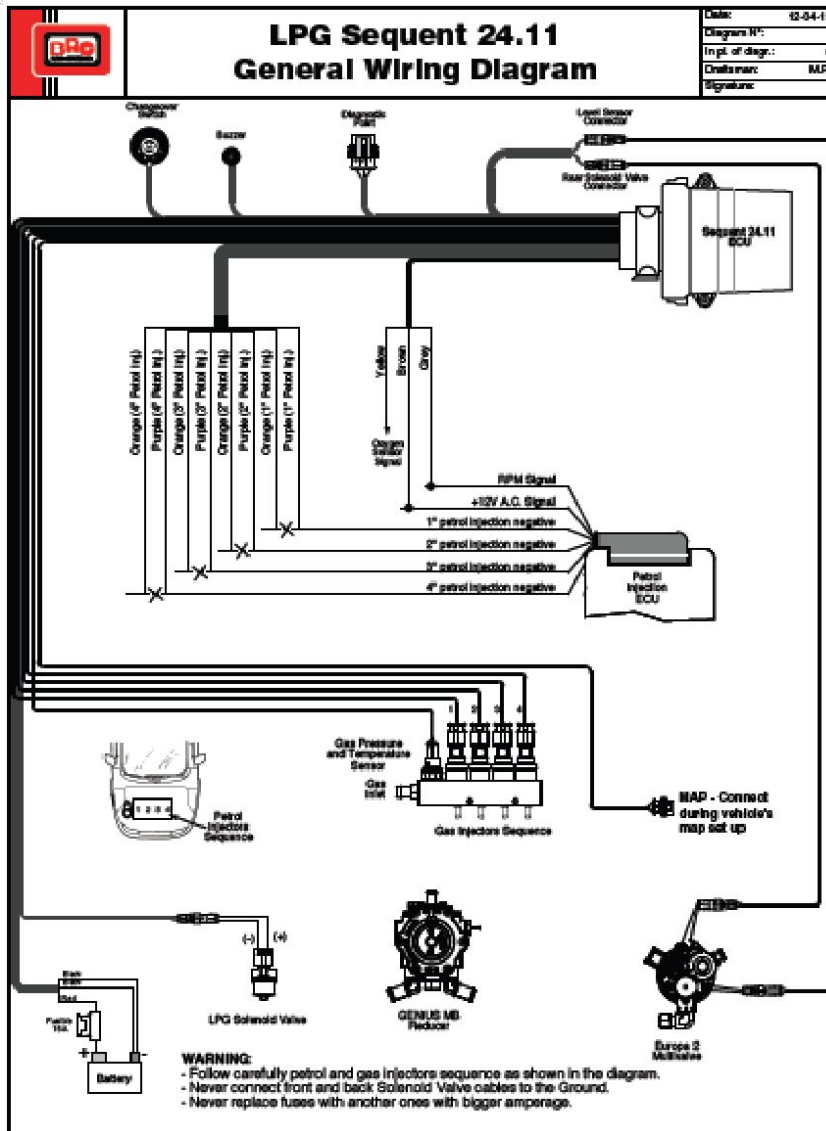
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*MAP Sensor
(Only during
Calibration)*



Sequent 24.11 System

BRC GAS EQUIPMENT



To Connect

- Power
- Ignition On
- Rpm Signal or MAP

Optional

- Lambda Oxygen Sensor

MAP Configuration

- Not Connected (Only during calibration) -RPM Connected-
- Brc (DE802042)
- OEM (Original MAP Sensor)



MAP OEM Calibration

ENGINE AT IDLE

Electric Value	Physical Value
<input type="text" value="253"/> U.C.	<input type="text" value="360"/> mbar
<input type="button" value="Acquire"/>	

ENGINE OFF

Electric Value	Physical Value
<input type="text" value="826"/> U.C.	<input type="text" value="990"/> mbar
<input type="button" value="Acquire"/>	

If It's been selected OEM MAP (Original MAP Sensor) is necessary doing a calibration of the sensor.



MAP OEM Calibration

BRC GAS EQUIPMENT

ENGINE OFF

Electric Value	Physical Value
<input type="text" value="826"/> U.C.	<input type="text" value="990"/> mbar
<p>Acquire</p>	

mbar = kPa * 10

1- Keep the engine switched-off with Contact Key on and Press Acquire

ENGINE AT IDLE

Electric Value	Physical Value
<input type="text" value="253"/> U.C.	<input type="text" value="360"/> mbar
<p>Acquire</p>	

mbar = kPa * 10

2- Crank and keep the engine on Petrol and Press Acquire



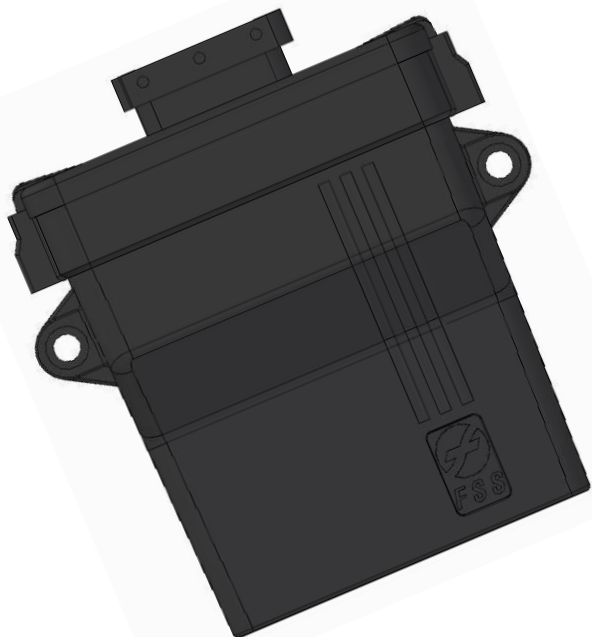
BRC GAS EQUIPMENT

New Components



Sequent 24MY10 ECU – Features

BRC GAS EQUIPMENT



- ✓ *For 3 – 4 cylinders Engine, Intaked and Supercharged*
- ✓ *Cutting and petrol injectors emulation integrated on gas ECU*
- ✓ *Sequential change-over*
- ✓ *Actuators Relay integrated on Gas ECU*
- ✓ *Automatically recharge-over to Petrol for empty Tank*
- ✓ *Tip-In\Tip-Out Calibration*
- ✓ *Open Loop Calibration*
- ✓ *VSR Strategy*



BRC Injector

BRC GAS EQUIPMENT



•INJECTOR



BRC Injectors

BRC GAS EQUIPMENT

BRC IN03_(Hybrid)



BRC IN03_MY09

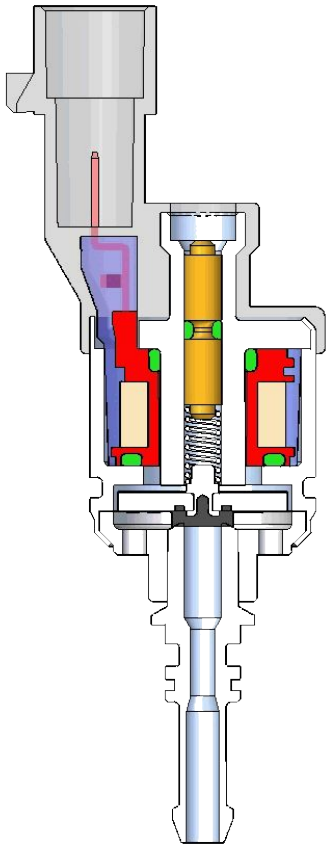


BRC IN03

IN03 MY09 CNG/LPG INJECTOR

BRC GAS EQUIPMENT

GENERAL FEATURES



- *Bottom feed injector designed and produced on OEM specifications*
- *Good linearity range*
- *Compact and small size package*
- *3 models available with different flow capacity*
- *ECE ONU R 110, R67-01 approved and ISO 15500 compliant*
- *Low operation noise level*



BRC GAS EQUIPMENT

S24.11

New Strategies



Petrol Contribution Strategy (VSR)

Sequent 24 MY10 and Sequent 24.11 Systems

BRC GAS EQUIPMENT

This strategy allows giving a petrol contribution during vehicle gas mode. Working condition (RPM, MAP) and petrol quantity to be injected can be calibrated through the new Plug & Drive Interface. It also allows protecting the life of valves seats, especially on vehicles suffering from this problem.

!WARNING!

VSR strategy does not assure feasibility
of any kind of vehicles.

*The List of inadvisable vehicles is absolutely still valid and
has priority on all feasibility confirmation or strategy.*



Petrol Contribution Strategy (VSR)

BRC GAS EQUIPMENT

You will find in **Setting-Up** menu a new section called “**VSR**” where you can enable strategy and change parameters.

☒ **VSR Strategy**

MAP min value :	<input type="text" value="450"/>	mbar	RPM minvalue :	<input type="text" value="500"/>
VSR correction :	<input type="text" value="25"/>	%	RPM max value :	<input type="text" value="3500"/>

MAP min value: strategy intervenes above this MAP value.

RPM min value: strategy intervenes above this RMP value.

RPM max value: strategy intervenes under this RMP value.

VSR correction: petrol percentage we want to inject. From the gas flow normally supplied to the engine, this percentage is deducted and the correspondent petrol quantity is given.

Press ENTER to confirm the new value.



Petrol Contribution Strategy (VSR)

BRC GAS EQUIPMENT



TON InjG: Gas injection time after deduction of the petrol percentage required.

TON InjB: Petrol Injection Time.

TON VSR: Injection Time corresponding to the petrol percentage to be supplied to the engine.

DC InjG and **DC InjB:** Gas and Petrol Duty Cycle in working condition.

Delta Qb VSR: VSR real intervention percentage depending on TonB variation.



Start & Stop Strategy

Sequent 24 MY10 and Sequent 24.11 Systems

BRC GAS EQUIPMENT

This strategy is dedicated to the vehicles equipped with Start & Stop. Peculiarity of this strategy is to reduce pollution and fuel consumption when vehicle stops, by switching the engine off.

At any engine switching on, our system should wait for the right changeover parameters set up, burning so too much petrol.

By enabling this strategy, above TGas and TH₂O values defined, the vehicle starts the engine in gas forced mode without taking into consideration these emergency startings for computation.

!Warning!

For this strategy, RPM must be connected in crankshaft modality or RPM counter.



Start & Stop Strategy

By enabling this strategy in **Setting Up/ Equipment Type** above TGas and TH₂O, values defined, the vehicle starts in gas forced mode without intervene on these emergency startings computation.

EQUIPMENT

EQUIPMENT : LPG

ENGINE : INTAKED

P1-TGAS SENSOR : PTS 4,5 Bar (Brown conn.)

INJECTION : SEQUENTIAL

N. CYLINDER : 4

ENGINE SIZE : 1600 cm³

INJECTOR TYPE : BRC IN03 Max Type (Orange)

M.A.P. SENSOR : NOT CONNECTED

WATER TEMPERATURE SENSOR : NOT CONNECTED

CHANGEOVER SWITCH : Standard MonoStable

LAMBDA 1 : NOT CONNECTED

AIR FLOW METER : UNDEFINED

ADVANCED

ADVANCED

START & STOP : ☒

START & STOP : ☒



BRC GAS EQUIPMENT

SPECIAL STRATEGIES ALREADY IN EXISTENCE



Gas Lack Compensation Strategy

Sequent 24 MY10 and Sequent 24.11 Systems

BRC GAS EQUIPMENT

This strategy is based on VSR. A petrol percentage can be injected above a Duty-Cycle Gas threshold previously set up through Interface SW able to satisfy engine needs.

In Setting/Changeover/Advanced you can find strategy default setting at 94 %.



Up to Duty Cycle gas 94%, only LPG is supplied to the engine.

Over 94%, when system should open GAS injectors, the difference is supplied instead by petrol injector, up to reach **Duty Cycle Max** previously set up. This limit needs a petrol final re-changeover.

E.g.: if flow to be supplied needs a Duty Cycle 98%, 94% of it will be LPG and 4% Petrol.



Advanced Injection Strategy

BRC GAS EQUIPMENT

A special strategy has been necessary to advance gas injection in order to improve driveability on some vehicles, Fiat 1400i 16V Starjet and Tjet, and solve some problems due to the movement of variable manifold.

This strategy can be used with RPM disabled on any vehicle for which advanced injection could improve Air/Gas mix combustion.

Enter Setting-Up/RPM to enable strategy.

RPM SIGNAL

☒ Signal Disabled

☐ RPM signal or crankshaft sensor

☐ Coil signal

Injection type : ☒ SEQUENTIAL

☐ SEMI SEQUENTIAL

☐ Injection advance

ADVANCED



Advanced Injection Strategy

For Sequent P&D, Sequent 24 MY10 and Sequent 24.11 Systems

BRC GAS EQUIPMENT

This SW works only on 4-cylinder engines.

E.g.: For 4-cylinder engines, we'll have a 180° advanced injection in comparison with petrol mode regular sequence.

Usually, the starting ignition order of the 4 cylinders is:

1 - 3 - 4 - 2

In order to advance sequence, SW uses as first injector the following one, so:

Regular Sequence:

1 - 3 - 4 - 2

Advanced Sequence

3 - 4 - 2 - 1

In this way Gas Injector 1 will go to the Gas Injector 3.

Then, Gas Injector 3 will go to the Gas Injector 4; Gas Injector 4 to the Gas Injector 2 and to the Gas Injector 2 to the Gas Injector 1.



Advanced Injection Strategy for Sequent P&D, Sequent 24 MY10 and Sequent 24.11 Systems

BRC GAS EQUIPMENT

!Warning! (1)

*This strategy is not compatible with VSR
and Gas Lack Compensation strategies.*



Advanced Injection Strategy

for Sequent P&D, Sequent 24 MY10 and
Sequent 24.11 Systems

BRC GAS EQUIPMENT

!Warning! (2)

This strategy cannot be used on Sequent 24 MY07. To enable a similar strategy on this kind of systems, you need to advance manually the gas injection by acting directly on gas injectors connectors.

Regular Sequence:

1 – 3 – 4 – 2

Advanced Sequence:

3 – 4 – 2 – 1

*So Gas Injector connector 1 will go to Gas Injector 3.
Then Gas connector 3 will go to position 4; Gas connector 4 to position 2 and Gas connector 2 to position 1.*



END OF LESSON:

QUESTIONS

&

DOUBTS