

# Manual Fitting Instructions Sequential Systems

The logo for Westport Fuel Systems, featuring the word "Westport" in blue and "Fuel Systems" in red, with a stylized fuel nozzle icon in red and blue.

**Westport™  
Fuel Systems**

**Westport Fuel Systems Italia S.r.l.**

# Indice

General Information .....	3
Tabel Sizing Nozzles for Injectores .....	4
Changeover Switch Operation .....	10
Cutting of 4 Cylinders Petrol Injectores .....	13
Cutting of 8 Cylinders Petrol Injectores .....	14
Eletrical Part 3 Cylindres System .....	15
Eletrical Part 3 Cylindres OBD System .....	16
Eletrical Part 4 Cylindres System .....	17
Eletrical Part 4 Cylindres OBD System .....	18
Eletrical Part 5 Cylindres System .....	19
Eletrical Part 6 Cylindres System .....	20
Eletrical Part 5/6 Cylindres System [Dedicated] DE534253/DE534255/ DE534256.....	21
Eletrical Part 8 Cylindres System .....	22
Eletrical Part 3 Cylindres System Dual Jet .....	23
Eletrical Part 4 Cylindres System Dual Jet .....	24
Standard Errors Codes .....	25
Program Errors Codes .....	26

# General Information

## 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.

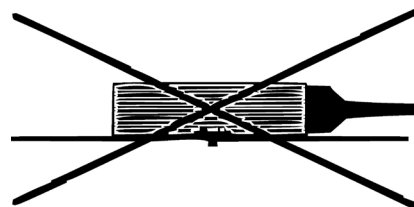
## Useful Information

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

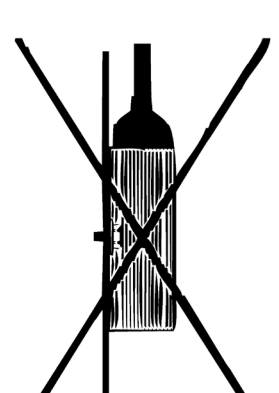
Advise the customer that if the GAS system fuse burns, the connections of the devices to which it is connected will be restored. It is strongly recommended not to replace the fuse with another one with a higher amperage rating since it may cause irreparable damage.

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. Westport Fuel System 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.

Incorrect Installation



Incorrect Installation



Correct Installation



# Tabel Sizing Nozzles for Injectors LPG

## Injectors Gemini / GP20 / JET20

TYPE NOZZLES	ENGINE	2 CYLINDERS HP	3 CYLINDERS HP	4 CYLINDERS HP	5 CYLINDERS HP	6 CYLINDERS HP	8 CYLINDERS HP
Ø 1,5 mm Cod. OT300281 (1 Mark)	ASPIRATED	\\	Up to 42	Up to 55	\\	\\	\\
	TURBO	\\	\\	Up to 74	\\	\\	\\
Ø 1,75 mm Cod. OT300262 (2 Mark)	ASPIRATED	\\	43 to 57	56 to 76	\\	\\	\\
	TURBO	\\	Up to 75	75 to 99	\\	\\	\\
Ø 2,0 mm Cod. OT300264 (3 Mark)	ASPIRATED	Up to 49	58 to 73	77 to 98	Up to 122	Up to 148	Up to 197
	TURBO	Up to 65	76 to 98	110 to 130	Up to 162	Up to 194	Up to 260
Ø 2,5 mm Cod. OT300266 (No Mark)	ASPIRATED	50 to 77	74 to 115	99 to 153	123 to 191	149 to 231	198 to 307
	TURBO	66 to 102	99 to 152	131 to 204	163 to 254	195 to 305	261 to 406
Ø 3,5 mm Cod. OT300269 (M)	ASPIRATED	78 to 109	\\	154 to 217	192 to 272	232 to 326	308 to 453
	TURBO	103 to 145	\\	205 to 292	\\	\\	\\

# Tabel Sizing Nozzles for Injectors CNG

## Injectors Gemini / GP20 / JET20

TYPE NOZZLES	ENGINE	2 CYLINDERS HP	3 CYLINDERS HP	4 CYLINDERS HP	5 CYLINDERS HP	6 CYLINDERS HP	8 CYLINDERS HP
Ø 1,5 mm Cod. OT300281 (1 Mark)	ASPIRATED	\\	Up to 39	Up to 53	\\	\\	\\
	TURBO	\\	\\	Up to 62	\\	\\	\\
Ø 1,75 mm Cod. OT300262 (2 Mark)	ASPIRATED	\\	40 to 54	54 to 73	\\	\\	\\
	TURBO	\\	Up to 64	63 to 84	\\	\\	\\
Ø 2,0 mm Cod. OT300264 (3 Mark)	ASPIRATED	Up to 47	55 to 71	74 to 95	Up to 120	Up to 142	Up to 190
	TURBO	Up to 56	65 to 83	85 to 111	Up to 139	Up to 166	Up to 222
Ø 2,5 mm Cod. OT300266 (No Mark)	ASPIRATED	48 to 75	72 to 111	96 to 148	121 to 185	143 to 223	191 to 296
	TURBO	57 to 87	84 to 130	112 to 174	140 to 217	167 to 260	223 to 347
Ø 3,5 mm Cod. OT300269 (M)	ASPIRATED	76 to 107	\\	149 to 215	186 to 250	224 to 321	297 to 428
	TURBO	88 to 125	\\	175 to 250	\\	\\	\\

# Tabel Sizing Nozzles for Injectors LPG

## Injectors TYPE 37

TYPE NOZZLES	ENGINE	2 CYLINDERS HP	3 CYLINDERS HP	4 CYLINDERS HP	5 CYLINDERS HP	6 CYLINDERS HP	8 CYLINDERS HP
Ø 1,5 mm Cod. OT300281 (1 Mark)	ASPIRATED	\\	Up to 48	Up to 64	\\	\\	\\
	TURBO	\\	\\	Up to 76	\\	\\	\\
Ø 1,75 mm Cod. OT300262 (2 Mark)	ASPIRATED	\\	49 to 61	65 to 82	\\	\\	\\
	TURBO	\\	\\	77 to 98	\\	\\	\\
Ø 2,0 mm Cod. OT300264 (3 Mark)	ASPIRATED	\\	62 to 82	83 to 109	Up to 136	Up to 162	Up to 216
	TURBO	\\	Up to 95	99 to 128	Up to 159	Up to 192	Up to 255
Ø 2,5 mm Cod. OT300266 (No Mark)	ASPIRATED	Up to 77	83 to 116	110 to 154	137 to 193	163 to 231	217 to 308
	TURBO	Up to 91	96 to 136	129 to 182	160 to 228	193 to 202	256 to 365
Ø 3,5 mm Cod. OT300269 (M)	ASPIRATED	78 to 94	117 to 141	155 to 189	194 to 235	232 to 283	309 to 378
	TURBO	92 to 111	137 to 167	183 to 223	229 to 279	203 to 335	366 to 446
Ø 4,0 mm cod. _____	ASPIRATED	95 to 100	\\	190 to 201	\\	284 to 303	\\
	TURBO	112 to 120	\\	224 to 238	\\	336 to 358	\\

# Tabel Sizing Nozzles for Injectors CNG

## Injectors TYPE 37

TYPE NOZZLES	ENGINE	2 CYLINDERS HP	3 CYLINDERS HP	4 CYLINDERS HP	5 CYLINDERS HP	6 CYLINDERS HP	8 CYLINDERS HP
Ø 1,5 mm Cod. OT300281 (1 Mark)	ASPIRATED	\\	Up to 43	Up to 58	\\	\\	\\
	TURBO	\\	\\	Up to 65	\\	\\	\\
Ø 1,75 mm Cod. OT300262 (2 Mark)	ASPIRATED	\\	44 to 56	59 to 75	\\	\\	\\
	TURBO	\\	\\	66 to 84	\\	\\	\\
Ø 2,0 mm Cod. OT300264 (3 Mark)	ASPIRATED	\\	57 to 73	76 to 98	Up to 122	Up to 109	Up to 197
	TURBO	\\	Up to 83	85 to 111	Up to 139	Up to 167	Up to 223
Ø 2,5 mm Cod. OT300266 (No Mark)	ASPIRATED	Up to 71	74 to 105	99 to 140	123 to 175	149 to 210	198 to 280
	TURBO	Up to 80	84 to 120	112 to 159	140 to 198	168 to 239	224 to 318
Ø 3,5 mm Cod. OT300269 (M)	ASPIRATED	72 to 86	106 to 129	141 to 171	176 to 215	211 to 258	281 to 344
	TURBO	81 to 92	121 to 145	160 to 194	199 to 243	240 to 292	319 to 389
Ø 4,0 mm cod. _____	ASPIRATED	87 to 91	\\	172 to 184	216 to 228	259 to 275	345 to 367
	TURBO	99 to 103	\\	195 to 208	244 to 260	293 to 311	390 to 416

# Tabel Sizing LPG Injectors IN03

Engine Power LPG - Power in kW / Cylinder						
TYPE	ENGINE	Delta p [mbar] e [kW / cyl]				
		800	1000	1200	1300	1500
NORMAL	ASPIRATED	16	17	20	20,5	-
	TURBO	21	22	25	25	-
MAX	ASPIRATED	-	22	26	27	30
	TURBO	-	29	32	32,5	36
SUPER MAX	ASPIRATED	-	31	-	39	40
	TURBO	-	39,5	-	44,5	47

KW for cylinder (3 cylinders)						
TYPE	ENGINE	Delta p [mbar] e [kW / 3 cyl]				
		800	1000	1200	1300	1500
NORMAL	ASPIRATED	48	51	60	61	-
	TURBO	63	66	75	75	-
MAX	ASPIRATED	-	66	78	81	90
	TURBO	-	87	96	97	108
SUPER MAX	ASPIRATED	-	93	-	117	120
	TURBO	-	118	-	113	141

KW for cylinder (4 cylinders)						
TYPE	ENGINE	Delta p [mbar] e [kW / 4 cyl]				
		800	1000	1200	1300	1500
NORMAL	ASPIRATED	64	68	80	82	-
	TURBO	84	88	100	100	-
MAX	ASPIRATED	-	88	104	108	120
	TURBO	-	116	128	130	144
SUPER MAX	ASPIRATED	-	124	-	156	160
	TURBO	-	158	-	178	188

# Tabel Sizing CNG

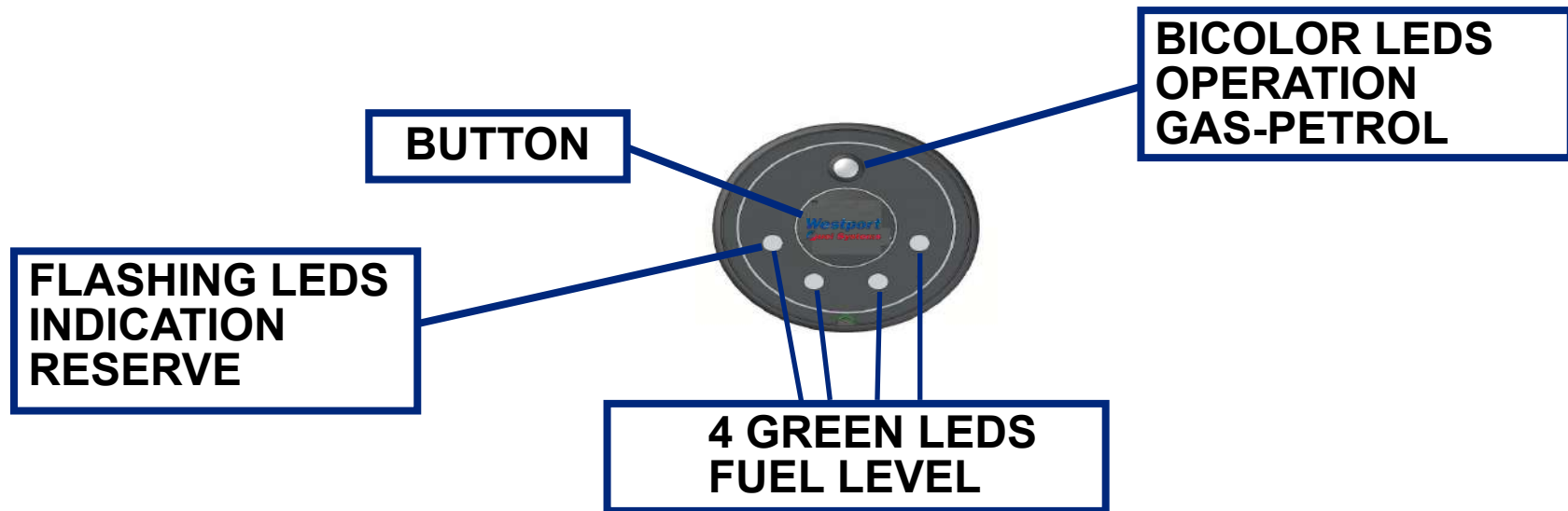
## Injectors IN03

Engine Power CNG - Power in kW / Cylinder					
TYPE	ENGINE	Delta p [mbar] e [kW / cyl]			
		1500	1800	2000	2500
NORMAL	ASPIRATED	15	16	17	20
	TURBO	18	19	19	23
MAX	ASPIRATED	19	20	22	26
	TURBO	23	24	26	30
SUPER MAX	ASPIRATED	25	-	28	32
	TURBO	30	-	36	38

KW for cylinder (3 cylinders)					
TYPE	ENGINE	Delta p [mbar] e [kW / 3 cyl]			
		1500	1800	2000	2500
NORMAL	ASPIRATED	45	48	51	60
	TURBO	54	57	57	69
MAX	ASPIRATED	57	60	66	78
	TURBO	69	72	78	90
SUPER MAX	ASPIRATED	75	-	84	96
	TURBO	90	-	108	114

KW for cylinder (4 cylinders)					
TYPE	ENGINE	Delta p [mbar] e [kW / 4 cyl]			
		1500	1800	2000	2500
NORMAL	ASPIRATED	60	64	68	80
	TURBO	72	76	76	92
MAX	ASPIRATED	76	80	88	104
	TURBO	92	96	104	120
SUPER MAX	ASPIRATED	100	-	112	128
	TURBO	120	-	144	152

## Changeover Switch Operation



### Diagnostic

In case of malfunctioning of the LPG system, detected by the same system diagnostic, the change-over switch buzzer will emit three sounds every 50 seconds and the red petrol fuel state LEDs will flash. In such situation, the vehicle runs with petrol. To interrupt the sound and flashing sequence, press the change-over switch.

### Emergency start

To carry out the emergency forced start, follow the procedure below;

- Position the change over switch in the Petrol position,
- Keep the change over switch key pressed,
- Start the key contact,
- Wait 4 seconds,
- At the sound of the buzzer start the engine.

# Changeover Switch Operation

## Changeover switch cycle and fuel level indication



Forced petrol mode



Petrol mode waiting for gas changeover conditions



Changeover from Petrol to Gas



Gas mode (full tank)



Gas Mode (tank level 3/4)



Gas Mode (tank level 2/4)



Gas Mode (tank level 1/4)



Gas Mode (LED blinking for gas reserve)

# Changeover Switch Operation

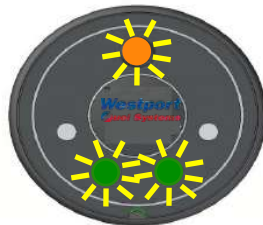
## Changeover switch warning in case of errors or notice



Petrol mode  
Empty tank  
(LED blinking + Buzzer sound)



Gas mode  
refilling over than 80%  
(4 LEDs blinking green)

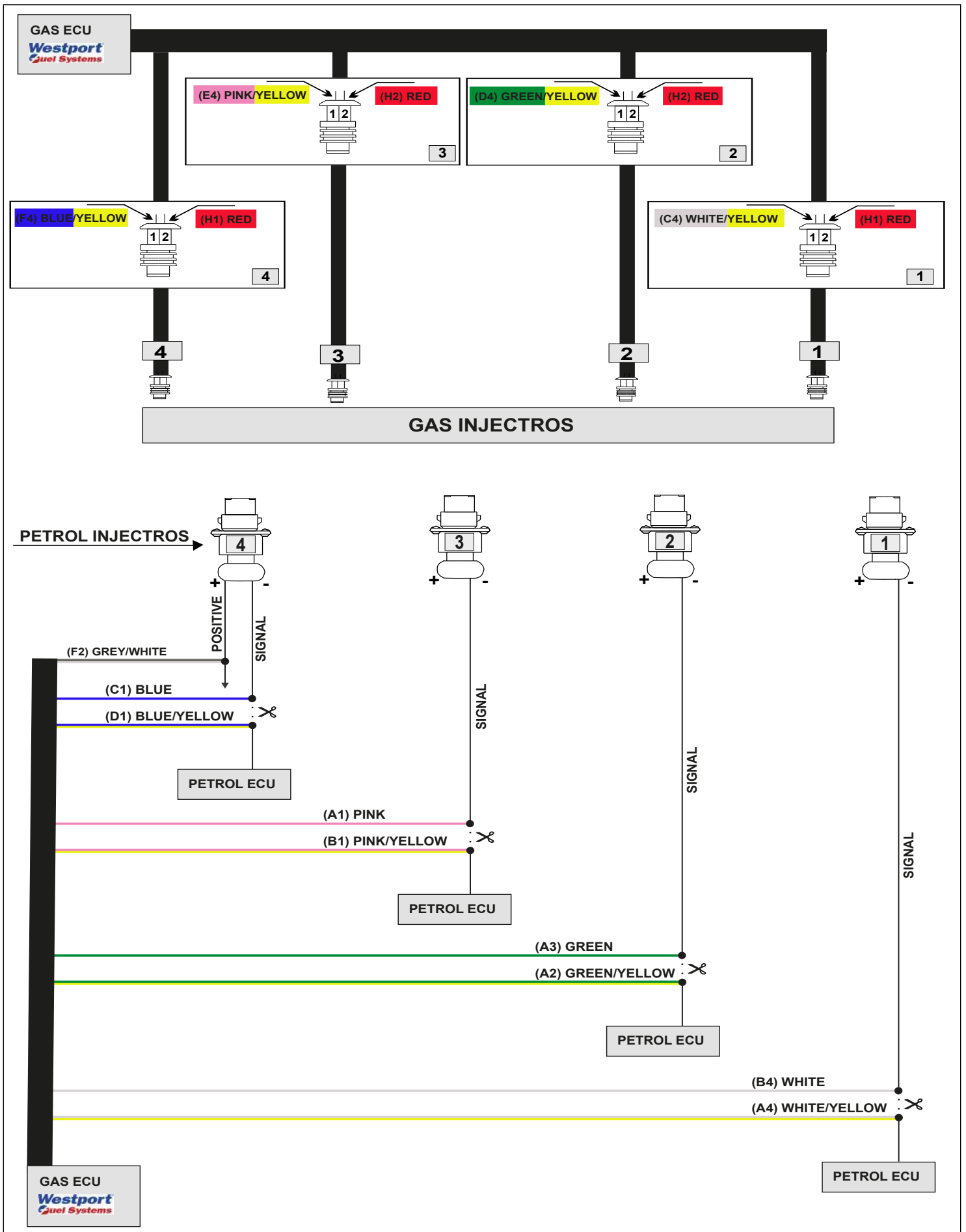


Absence of communication  
between ECU and switch  
(Orange LED + 2 central green LEDs blinking)

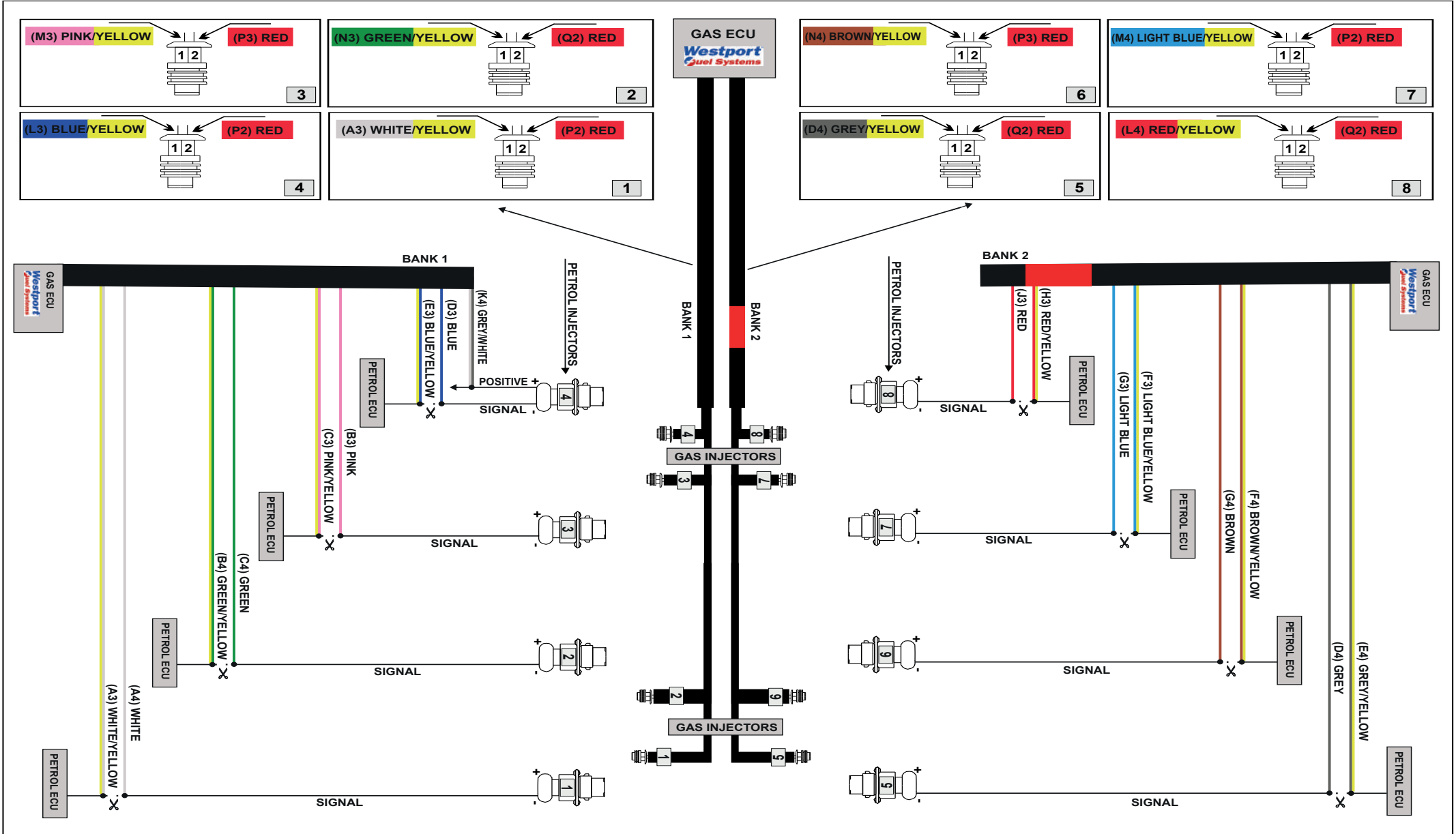


Gas error recording  
(red LED blinking + Buzzer sound)

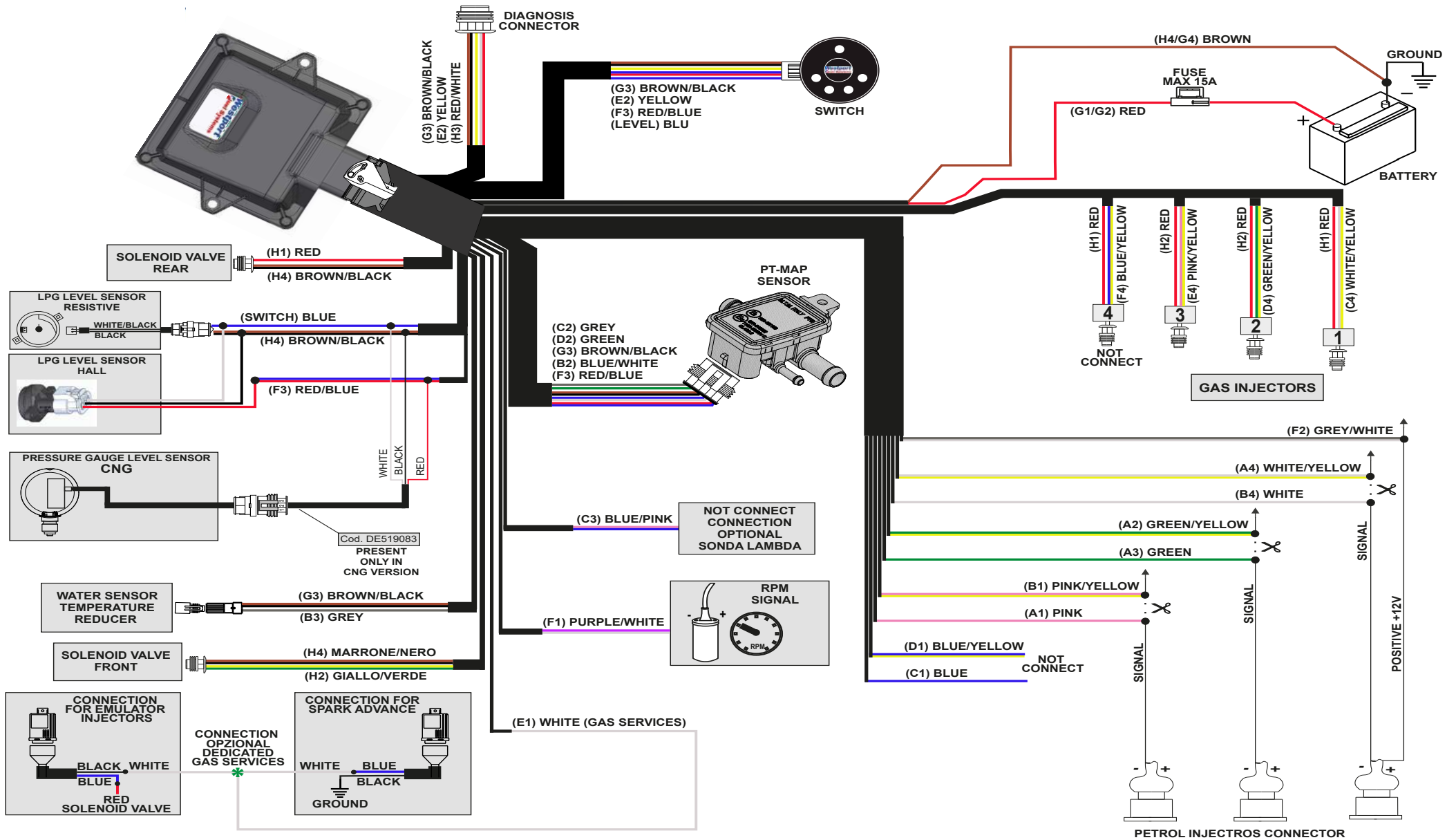
# Cutting of 4 Cylinders Petrol Injectors



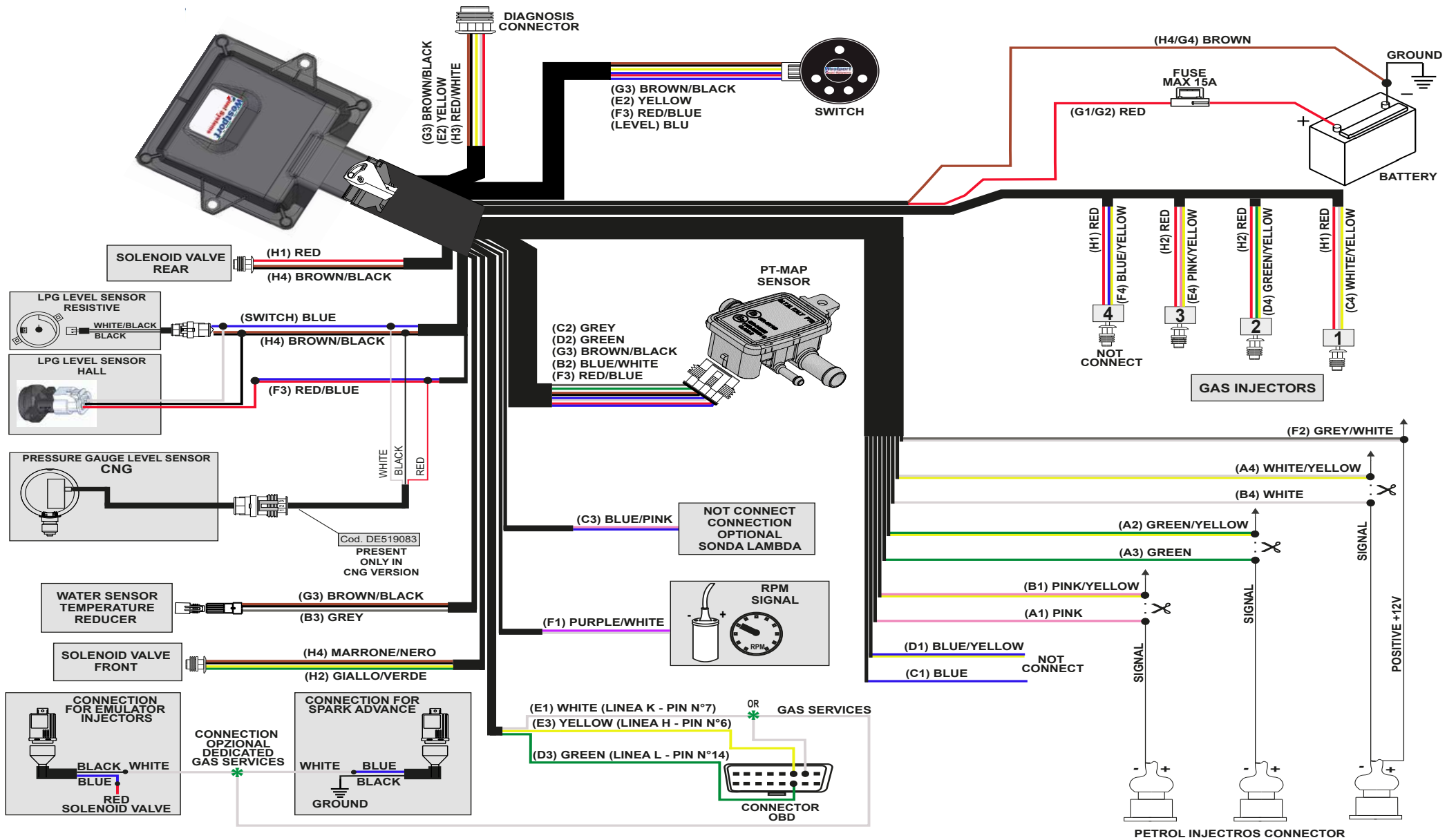
# Cutting of 8 Cylinders Petrol Injectors



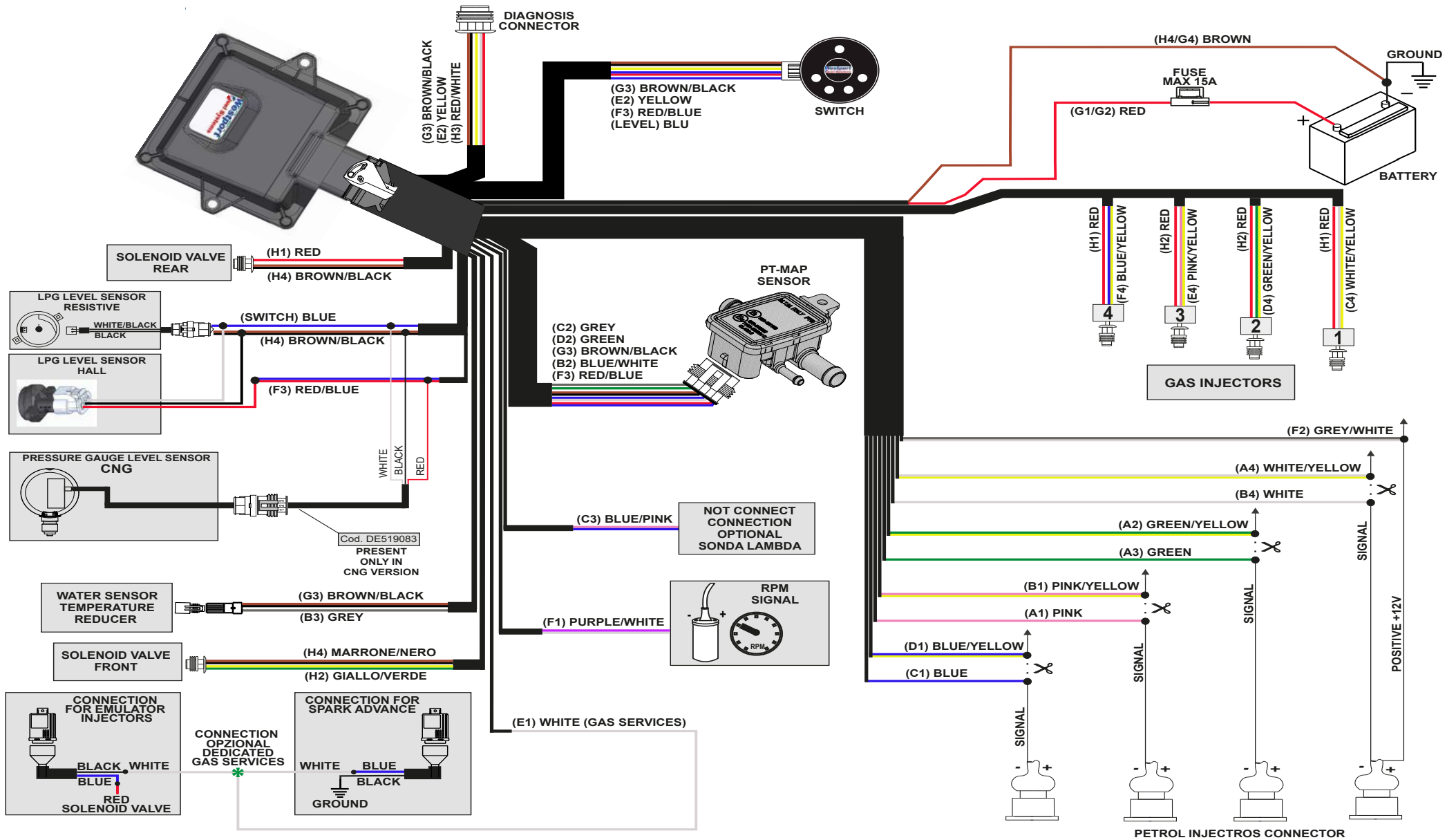
# Electrical Part 3 Cylinders System



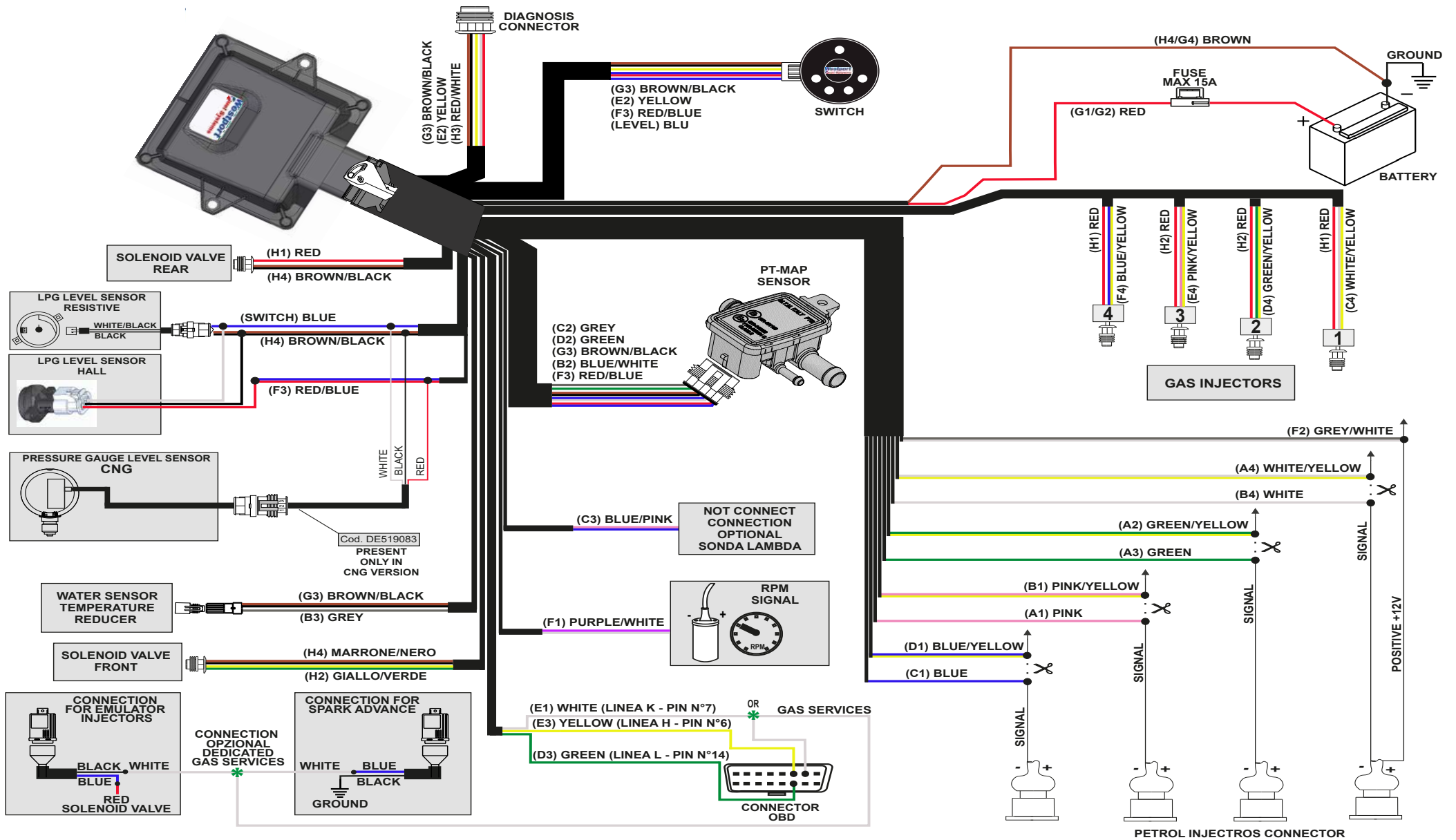
# Electrical Part 3 Cylinders OBD System



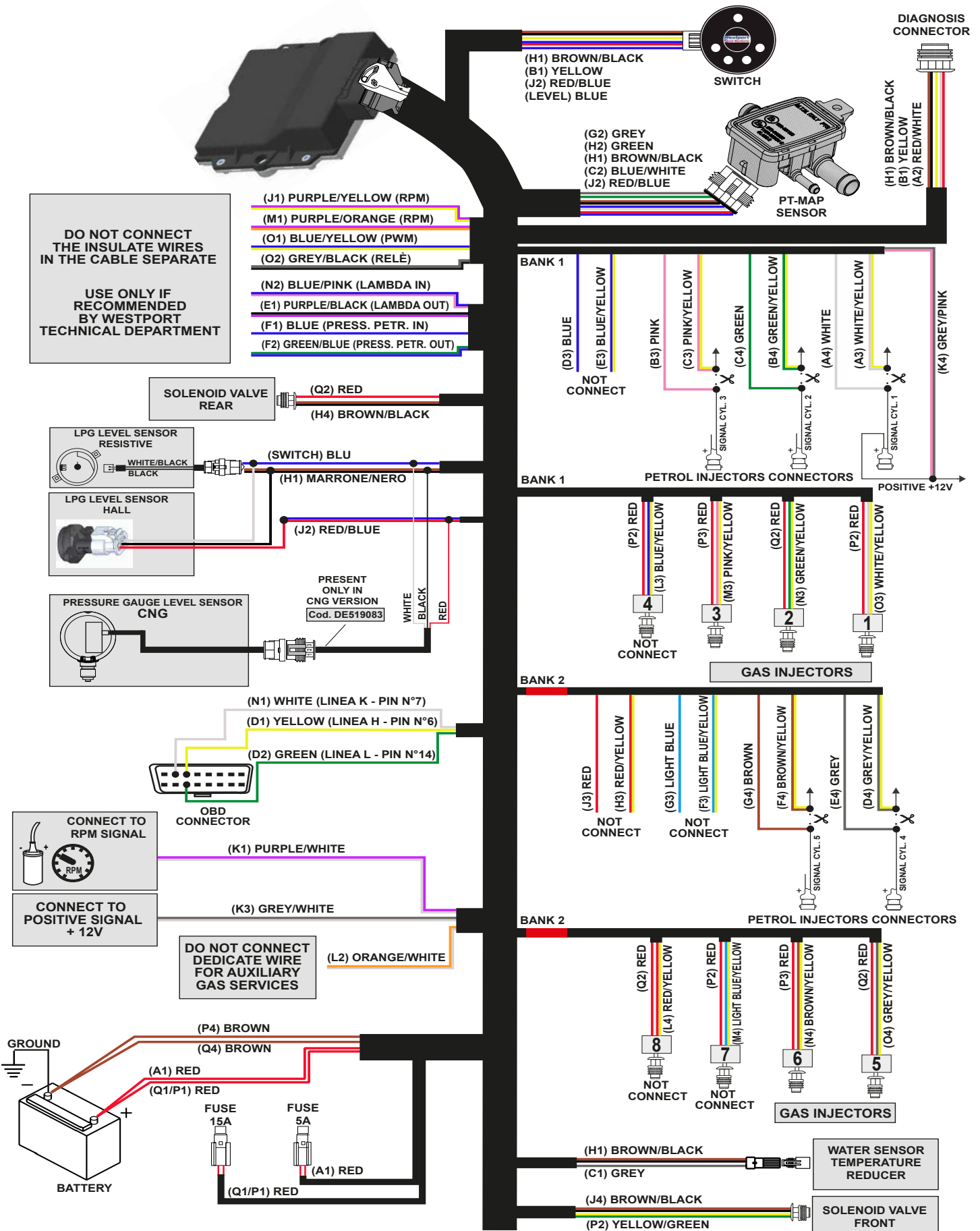
# Electrical Part 4 Cylinders System



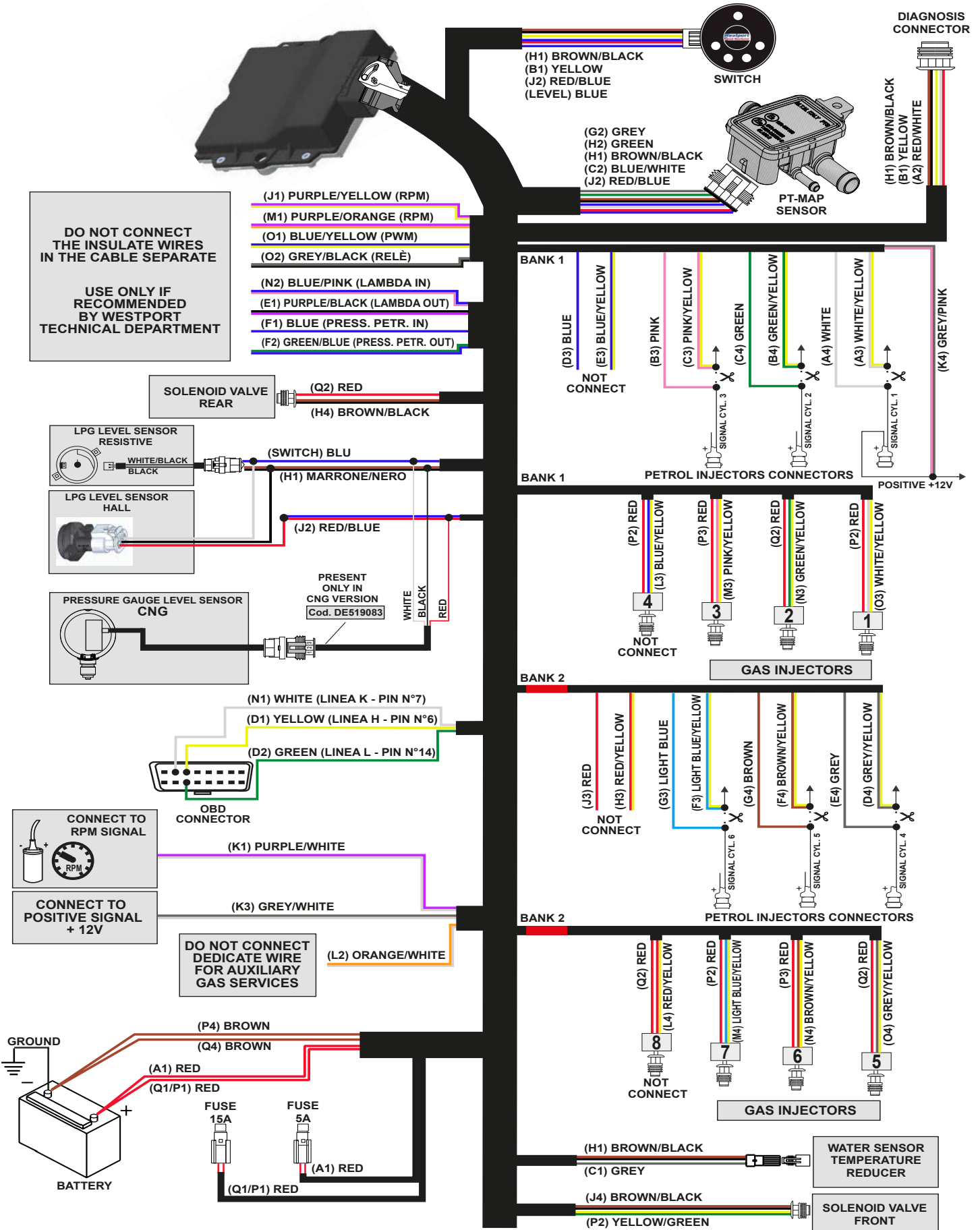
# Electrical Part 4 Cylinders OBD System



# Electrical Part 5 Cylinders System

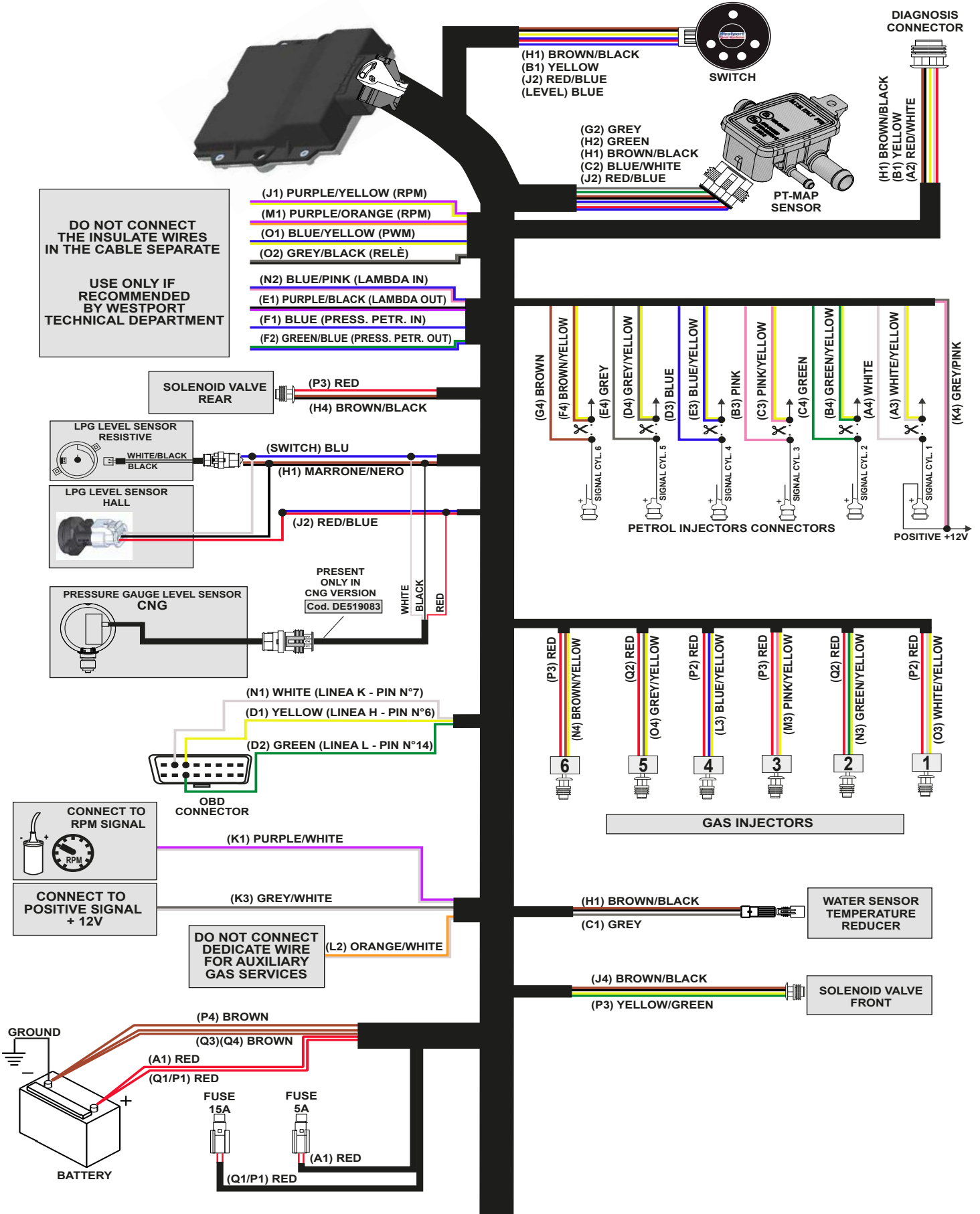


# Electrical Part 6 Cylinders System

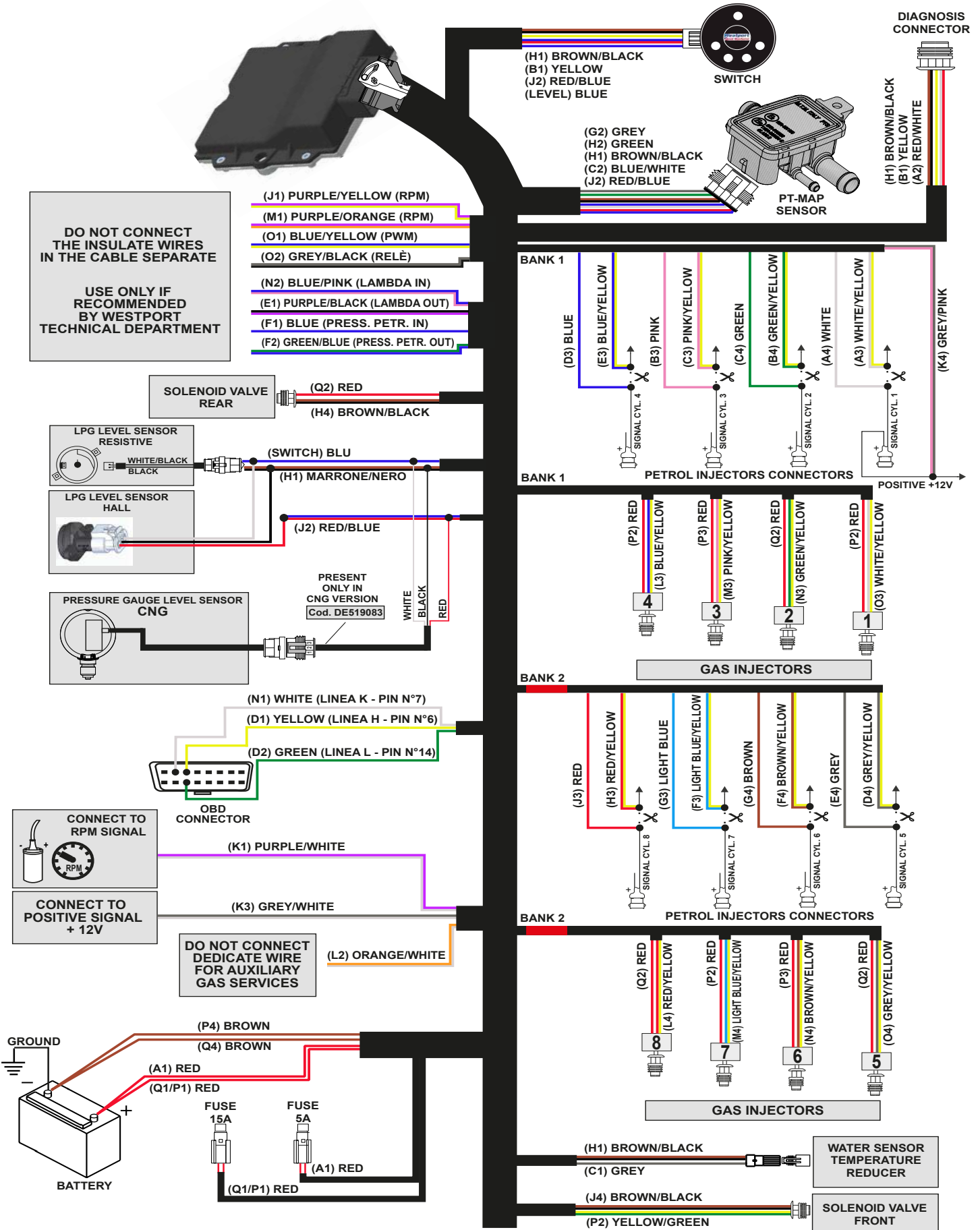


# Electrical Part 6 Cylinders System [Dedicated]

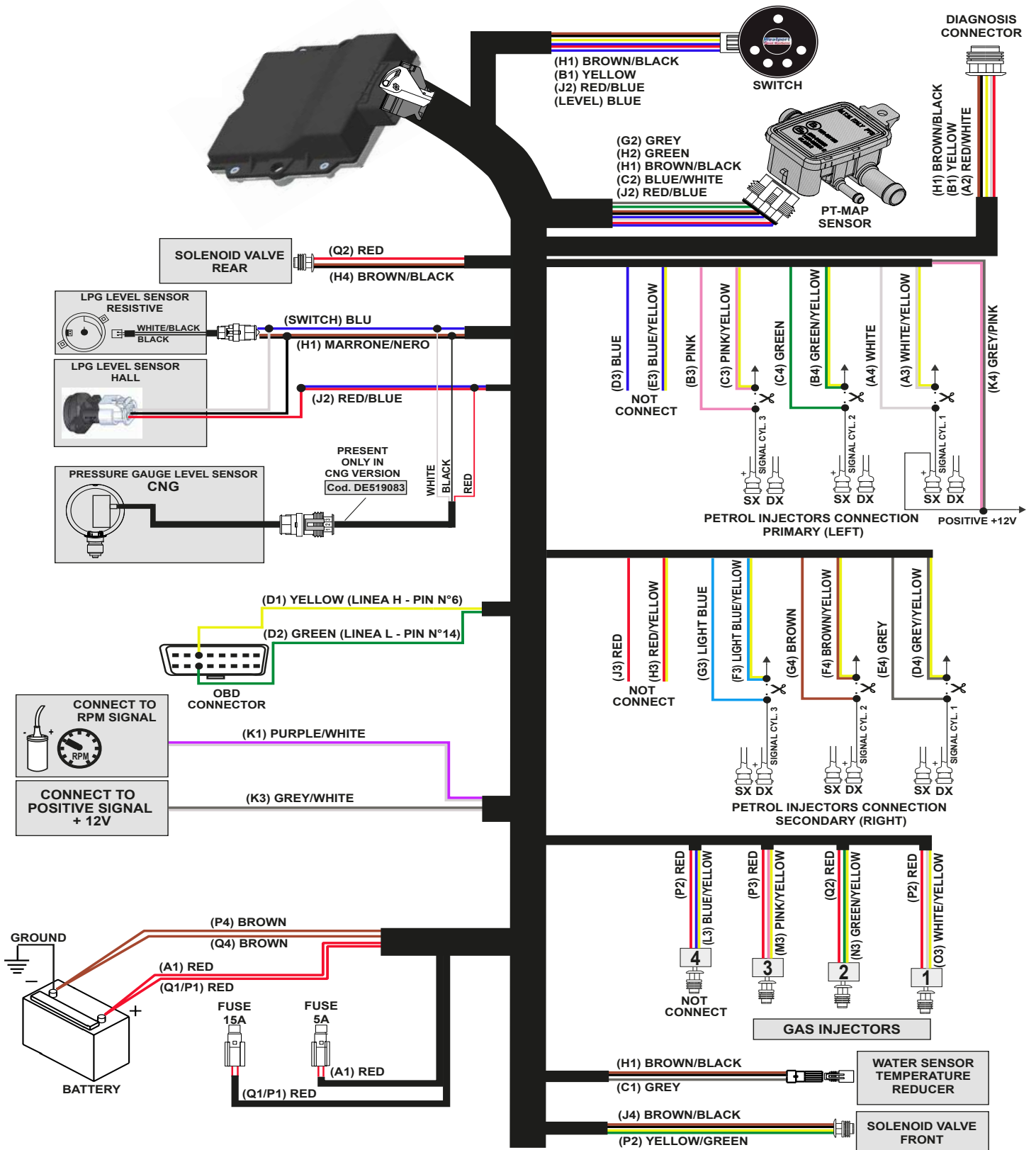
Cod. DE534253 / DE534255 / DE534256



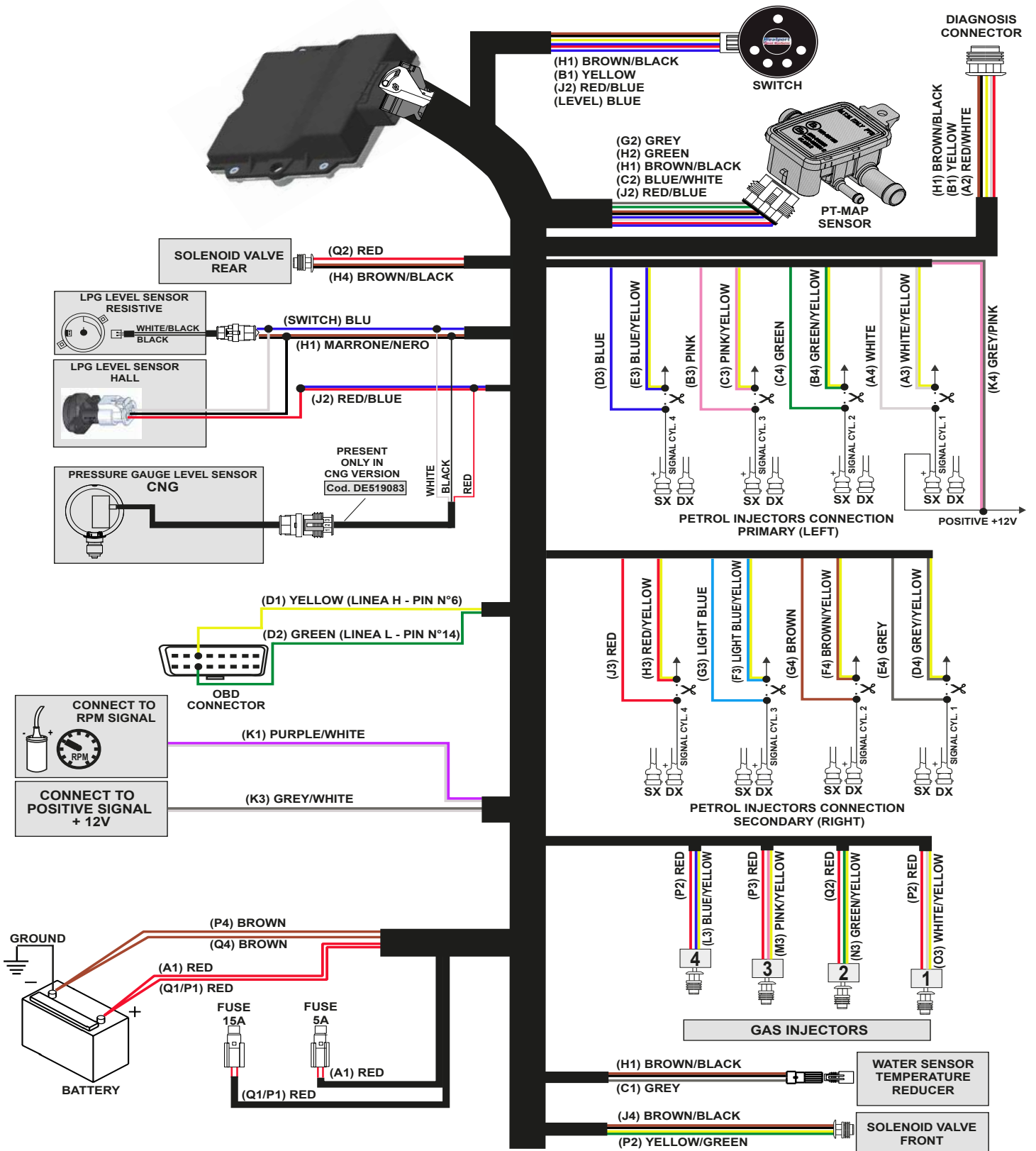
# Electrical Part 8 Cylinders System



# Electrical Part 3 Cylinders System Dual-Jet



# Electrical Part 4 Cylinders System Dual-Jet



## Standard Errors Codes

ERROR CODE	DESCRIPTION
P0006	Rear Fuel Cut-Off Solenoid Valve Control Circuit Low
P0007	Rear Fuel Cut-Off Solenoid Valve Control Circuit High
P01A5	Alternative fuel rail pressure circuit low voltage
P01A6	Alternative fuel rail pressure circuit high voltage
P01B5	Alternative fuel rail temperature, circuit performance
P01B6	Alternative fuel rail temperature circuit low voltage
P01B7	Alternative fuel rail temperature high voltage
P2146	Alternative fuel actuators supply voltage
P16B4	Sensors supply voltage low
P22DA	Cylinder 1 alternative fuel injector circuit low
P22DB	Cylinder 1 alternative fuel injector circuit high
P22DE	Cylinder 2 alternative fuel injector circuit low
P22DF	Cylinder 2 alternative fuel injector circuit high
P22E2	Cylinder 3 alternative fuel injector circuit low
P22E3	Cylinder 3 alternative fuel injector circuit high
P22E6	Cylinder 4 alternative fuel injector circuit low
P22E7	Cylinder 4 alternative fuel injector circuit high
P22EA	Cylinder 5 alternative fuel injector circuit low
P22EB	Cylinder 5 alternative fuel injector circuit high
P22EE	Cylinder 6 alternative fuel injector circuit low
P22EF	Cylinder 6 alternative fuel injector circuit high
P22F2	Cylinder 7 alternative fuel injector circuit low
P22F3	Cylinder 7 alternative fuel injector circuit high
P22F6	Cylinder 8 alternative fuel injector circuit low
P22F7	Cylinder 8 alternative fuel injector circuit high
P2666	High Pressure cut-off solenoid valve in front, control circuit low
P2667	High Pressure cut-off solenoid valve in front, control circuit high
P15AE	System voltage low voltage
P15AF	System voltage high voltage
P2115	Water temperature sensor signal not plausible

# Program Errors Codes

ERROR CODE	CAUSE
0	No error
1	Generic error
2	Framework.Net 4.0 Extended not installed
3	SQL Server Compact 4.0 not installed
4	The language set for the application is not valid (it does not exist in the DB, or it exists but the resource file is missing)
5	License File error
6	Error in the chart settings File
100	Error in the Database Opening
101	Error in the retrieval of the SQL command
102	Error in the retrieval of the SQL parameter
103	Error in the retrieval of the languages
104	Error in the retrieval of the skin info (id_group and group code)
105	Error in the retrieval in the enabling of user functions
106	Error in the retrieval of the list of the variables based on the skin and language
107	Error in the retrieval of the info relating to the ecu and software (ECU and ECU_DERIVATIVES and SOFTWARE and Enabling of Functions - GetEcu-Details)
108	ECU not present in the DB (GetEcuDetails)
109	ECU sw not present in the DB (GetEcuDetails)
200	Error in the initialisation of the communication library (oEcuLib.InitLibrary)
201	Error in the opening of the connection (oEcuLib.OpenConnection)
202	The request for info to the library returned FALSE
203	The control unit returned a negative reply to the request
205	The data that has returned from the control unit is not in the correct format (DATA_KO)
206	Error in the procedure management of the info (OnGetEcuInfo)
207	There is no feature to read the Flag in RAM or failure in the read request (SharedRamwithPC)
300	The Ecu has an ID that is not complete, and the user is not enabled to connect to Ecu with an incomplete ID
301	The Ecu was programmed by a toll of a group different from the user's license
302	Ecu not associated to the SKIN group
303	File A2L does not exist
304	Error in the loading of the A2L file