

KMS

MP25(M) / MA25(M) Wiring

Part nr: 01-01-01-0001(2/3/4)



Kronenburg Management Systems

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This document contains detailed information on how to connect the KMS MP25(M) and MA25(M) ECU for multiple applications. Additional information, user manuals and software can be found on our website: <http://kms.vankronenburg.nl> or on the software CD included with the ECU. For ease of use of this document, we refer to all ECU's (MP25(M) and MA25(M)) as the MP25 ECU.

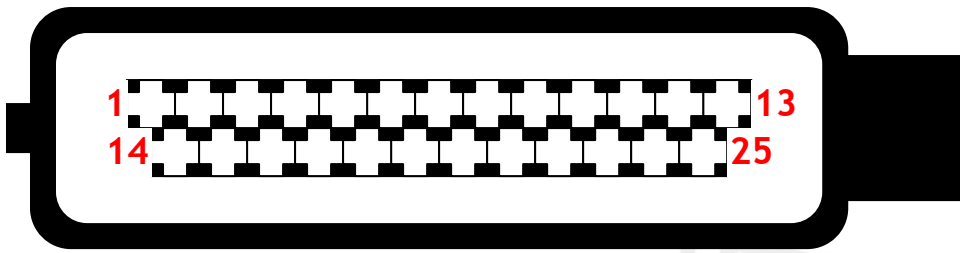
1 Pin output

The main connector of the MP25 consists out of 25 pins. Each pin has its own function which can be seen in the overview below including wire colours and thickness.

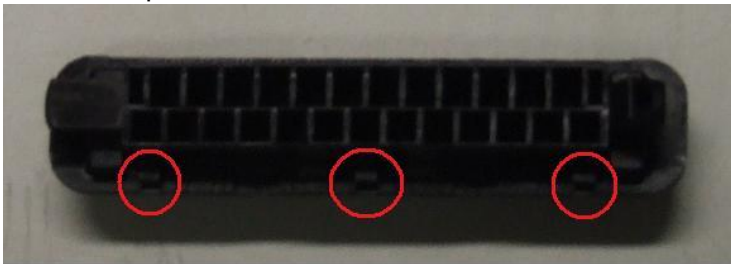
Pin nr.	Colour	Wire diameter	Function
1	white	0,5mm ²	Lambda signal 1
2	pink/black	0,5mm ²	Oil pressure signal
3	grey/blue	0,5mm ²	Water temperature signal
4	white/red	0,5mm ²	Analog aux input: aux / A.L.S. / launch / lambda signal 2 / EGT
5	red/blue	0,5mm ²	Air temperature signal
6	orange/black	0,5mm ²	Boost Control
7	red/black	0,5mm ²	Tacho output
8	purple	0,5mm ²	Ignition output 3
9	green	0,5mm ²	Ignition output 2
10	orange	0,5mm ²	Ignition output 1
11	white	0,75mm ²	Injector output
12	red	0,75mm ²	12V Injector supply
13	red	0,75mm ²	12V ECU supply
14	yellow	0,5mm ²	5V TPS sensor supply
14	yellow	0,5mm ²	5V MAP sensor supply
15	grey	0,5mm ²	TPS signal
16	grey/black	0,5mm ²	MAP signal
17	black	0,5mm ²	Sensor ground (Air T)
17	black	0,5mm ²	Sensor ground (Water T)
17	black	0,5mm ²	Sensor ground (TPS)
17	black	0,5mm ²	Sensor ground (MAP)
17	blue + shield	0,5mm ² (shielded)	Crank-sensor ground
18	red	0,5mm ² (shielded)	Crank-sensor signal inductive
19	yellow/black	0,5mm ²	Launch Control
20	green/red	0,5mm ²	Powershift / Airco
21	white/black	0,5mm ²	Fuel pump relay
22	yellow/red	0,5mm ²	Aux 3 out
23	blue	0,5mm ²	Aux 1 out / Ignition output 5
24	pink	0,5mm ²	Aux 2 out / Ignition output 4
25	black	0,75mm ²	ECU ground
25	black	0,5mm ²	Lambda ground

When disassembled, the pin numbers can be read on the back of the main connector of the MP25. These numbers can also be seen in the following drawing, seen from the front of the main connector of the MP25 ECU.

MP25(M)/MA25(M) main connector



The pins in the main connector can be blocked by sliding the back part of the main connector downwards. Unlocking the pins can be done in reversed order, by sliding the back part of the main connector upwards.

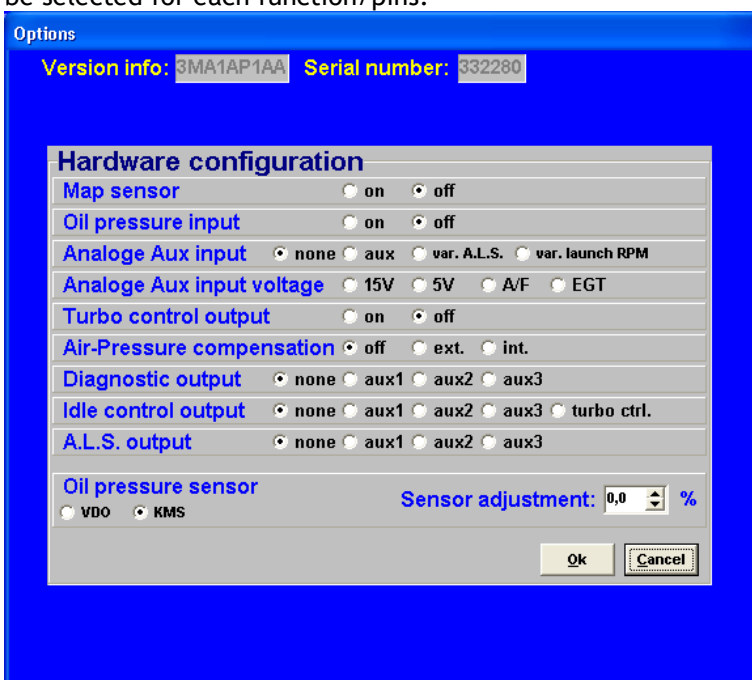


Unlocked



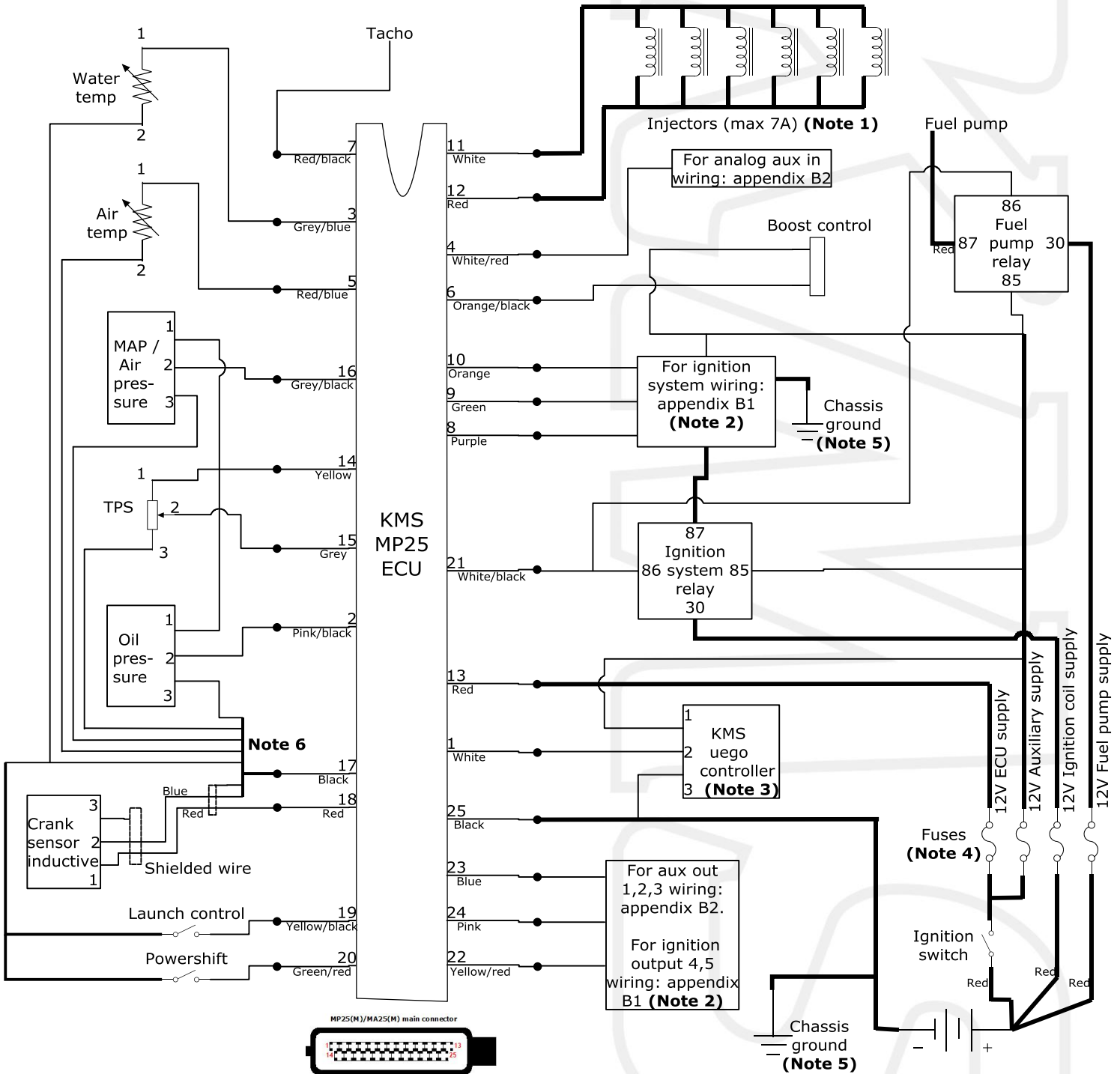
Locked

Some functions for certain pin outputs, must be defined in the hardware configuration of the ECU. When you are in the main screen of the software program, go to 'options (F4)' and then click 'hardware configuration'. The following screen will appear where different applications/sensors can be selected for each function/pins.



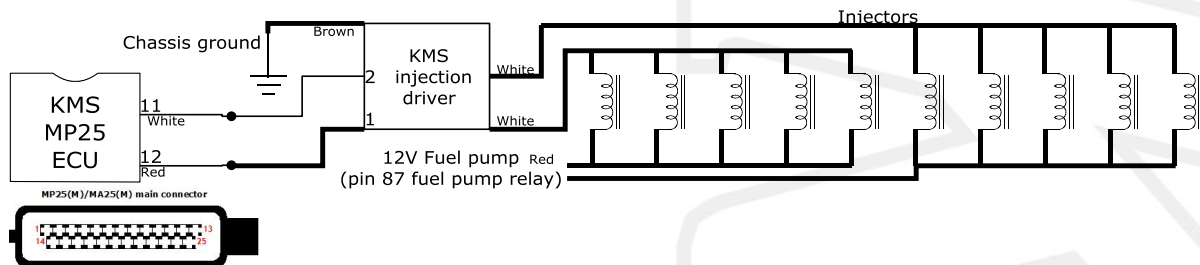
2 Main wiring

Below a wiring diagram is shown on how to connect the MP25 ECU to different sensor and actuators. This is a universal diagram which can be used for any type of engine, except for the connection of the ignition system and auxiliary analog inputs. These are described in the appendixes for different types of engines and applications. Wire colours are mentioned for each pin of the MP25 ECU and can also be seen on page 3, together with the wire thickness.



2.1 Main wiring notes

Note 1: The injector output can deliver a maximum current of 7A. This means that a maximum of 6 high impedance ($\geq 12 \text{ Ohm}$) injectors can be used on one injector output (pin 11). When using low impedance injectors ($< 12 \text{ Ohm}$) or more than 6 high impedance injectors on one injector output, an external KMS injection driver needs to be used. KMS injection drivers can take up to a maximum of 10A per output. For connection of the injection driver, see detailed drawing below. See also chapter 2.2 'Specification'.



Note 2: Auxiliary output 1 and 2 can be used as two extra ignitions outputs. For connection/wiring of aux outputs 1 and 2 as ignition outputs, see appendix B1. Connection/wiring of the outputs for auxiliary functions can be seen in appendix B2.

Note 3: A KMS uego display, controller or standard lambda sensor can be connected to this input. When using a KMS uego display, the display can be connected to the MP25 via serial communication for displaying multiple engine parameters in the lambda display.

Note 4: The value/capacity of the fuse is dependent on the total maximum current of the electrical components connected. See chapter 2.2 'Specification' for deterring the fuse values.

Note 5: Preferably put all ground connections (**except coil ground!**) on the same chassis point, to prevent a difference in potential between the grounds. **Warning: The coil ground should be connected to the chassis on a separate point to prevent remaining ignition currents from transferring to the ECU system.**

Note 6: All sensor grounds (including the shield of the crankshaft wires) must be soldered together at one point as close as possible to the main connector. The connecting point should then be wired to the main connector by one single wire.

2.2 Specification

2.2.1 Fuses

As described before, the value/capacity of the fuse for each voltage supply is dependent on the total maximum current of the electrical components connected. The following steps need to be taken to determine the capacity/value of the fuse for each 12V supply:

1. Calculate the maximum current by adding the currents below for the applications in use.

Application:	Current:
ECU (including all sensors and inputs)	1A
Aux out 1	1A
Aux out 2	1A
Aux out 3	1A
KMS uego display/controller	4A
Boost control	1A
EGT (analog aux in)	1A
Single ignition coil	10A/single coil
4 cyl. dis ignition coil	20A
6 cyl. dis ignition coil	30A
Fuel pump	Depending on fuel pump being used, see manufacturers recommendations.

Injectors high impedance (≥ 12 Ohm)
Injectors low impedance (< 12 Ohm)

1A/injector
When using low impedance injectors or more than 6 high impedance injectors on one injector output, measure the resistance over the injectors to determine the current.

2. After calculating the current, multiply this value by 1,2. The result is the **minimum** value/capacity of the fuse. The applied fuse should be the subsequent standard fuse value. (Standard fuse values: 2.5, 5, 7.5, 10, 15, 20, 25)

For example:

12V ECU fuse: ECU + 8 high impedance injectors = $9A * 1,2 = 10,8A$: minimum fuse value, so use in this case a 15A fuse for the 12V ECU.

12V Auxiliary supply: (2x) KMS uego display + boost control + EGT + Auxout1 + Auxout2 + Auxout3 = $13A * 1,2 = 15,6A$: minimum fuse value, so use in this case a 20A fuse for the 12V Auxiliary.

12V Ignition coil supply: (2x) 4 cyl. dis ignition coil = $40A * 1,2 = 48A$. When connecting 2 dis ignition coils, two separate 12V supply's should be made (see also appendix B1): $48A / 2 = 24A$: minimum fuse value, so use in this case two 25A fuses for both 12V Ignition coil supply's.

12V Fuel pump supply: fuel pump = 20A (according to manufacturer).

2.2.2 Wire thickness

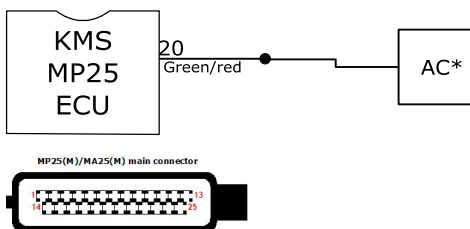
The following wire thicknesses should be maintained for the maximum continuous current through the wires:

Maximum current:	Wire thickness:
3A	0,5 mm ²
7,5A	0,75 mm ²
15A	1 mm ²
25A	1,5 mm ²

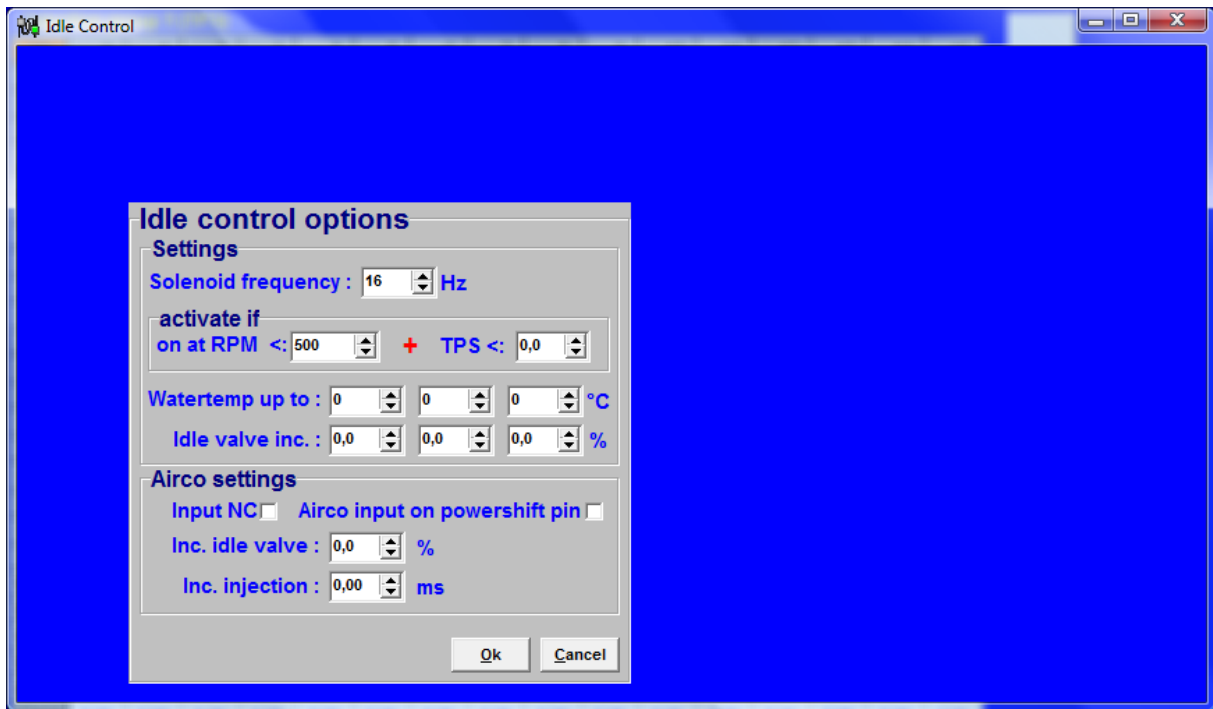
2.3 Double function wiring

2.3.1 Airco system wiring

Compensation of the airconditioning system load on the engine can be controlled by the MP25 ECU by adjusting fuel and idle valve in order to maintain a constant idle R.P.M. of the engine. Therefore the signal wire of the airconditioning should be connected/wired to the MP25 to make sure the ECU knows when the airconditioning is on. The signal wire of the airconditioning should be connected to the powershift (pin 20) connection, meaning that powershift can no longer be used.

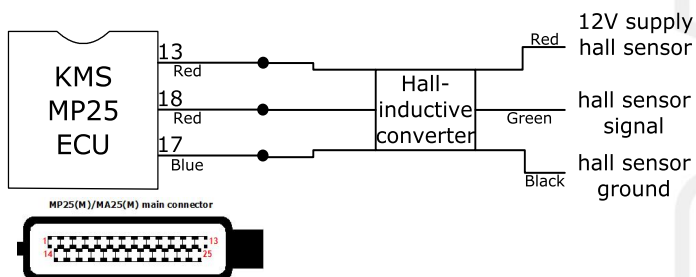


For activating the airconditioning compensation in the software, in the main screen go to the 'idle control tables' (F6) → 'idle control options'. The following screen should appear where airco settings can be made.



2.3.2 Hall → inductive converter

When a hall sensor is used at the crank, a hall-to-inductive converter needs to be used. The converter can be connected directly to the main connector of the ECU or KMS crank signal cable (the black wire, shield ground, of the KMS crank signal cable will not be used in this case) and hall sensor. Wiring of the hall → inductive converter is shown in the illustration below.

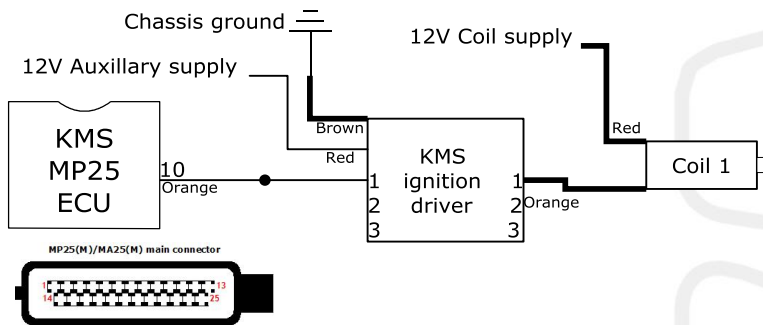


3 Appendix B1: Ignition system wiring

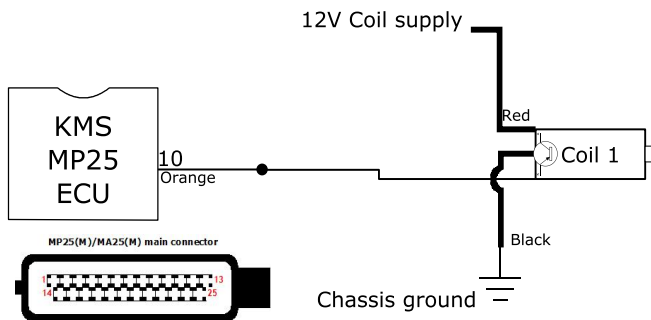
The connection/wiring of the ignition system depends on the type of ignition system and engine being used. The following diagrams illustrate the wiring for different ignition systems on different types of engines.

3.1 1 cylinder engines

3.1.1 1 cyl. single coil (without amplifier)

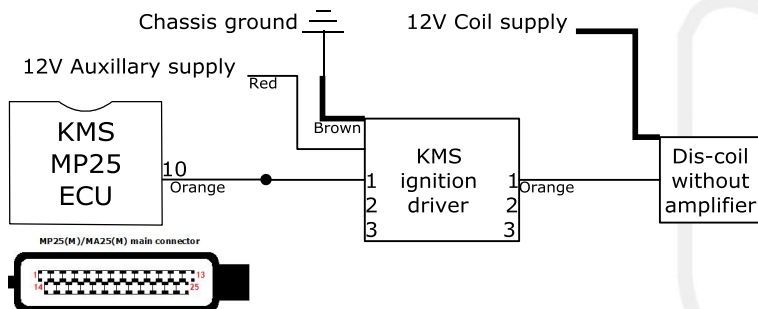


3.1.2 1 cyl. single coil (with amplifier)

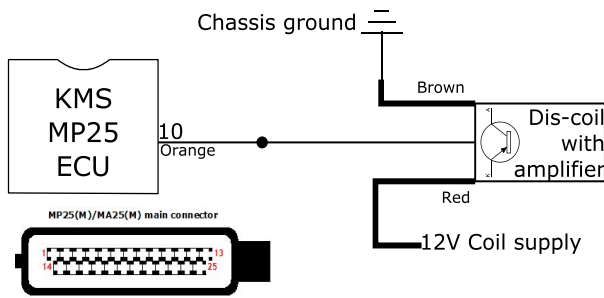


3.2 2 cylinder engines

3.2.1 2 cyl. dis-coil (without amplifier), firing order: 1-2

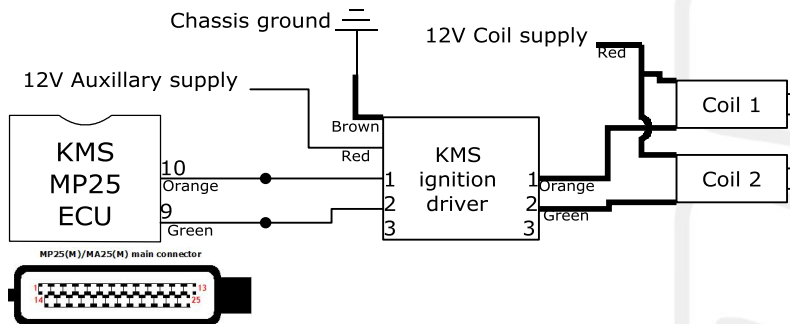


3.2.2 2 cyl. dis-coil (with amplifier), firing order: 1-2

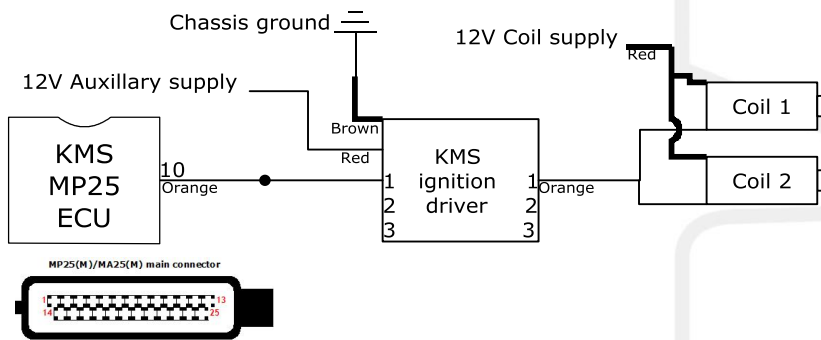


3.2.3 2 cyl. single coils (without amplifier), firing order: 1-2

Firing angle: 45°, 90° or 180°

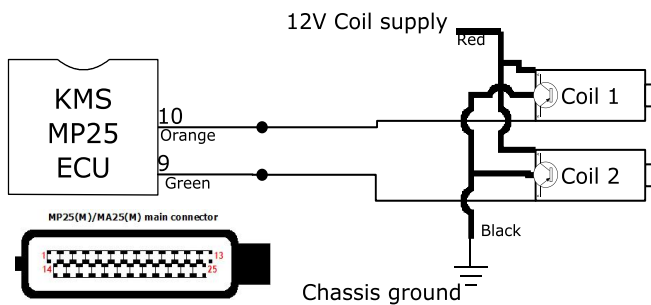


3.2.4 2 cyl. single coils (without amplifier), firing order: Simultaneous

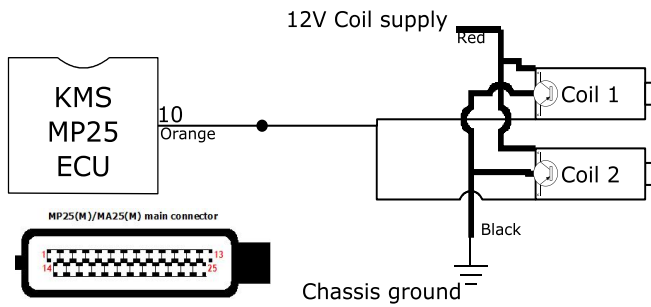


3.2.5 2 cyl. single coils (with amplifier), firing order: 1-2

Firing angle: 45°, 90° or 180°

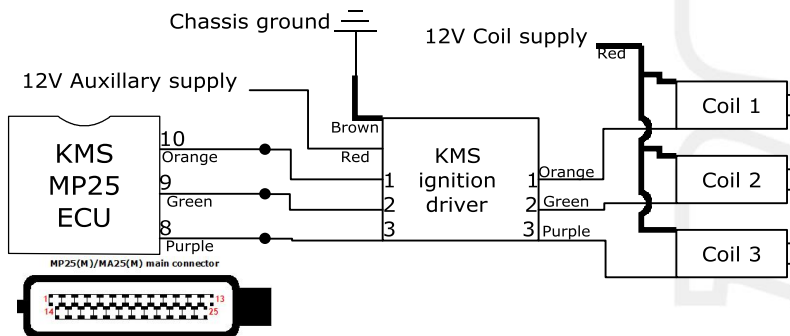


3.2.6 2 cyl. single coils (with amplifier), firing order: Simultaneous

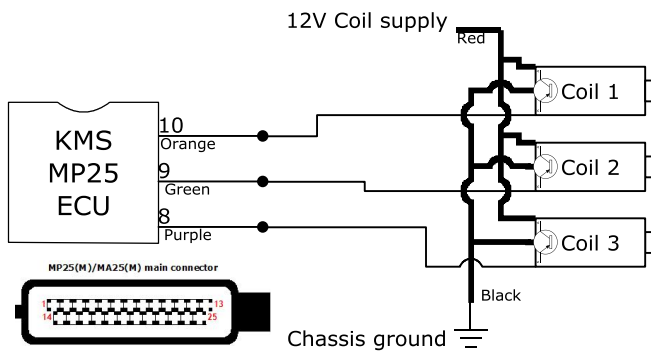


3.3 3 cylinder engines

3.3.1 3 cyl. single coils (without amplifier), firing order: 1-2-3

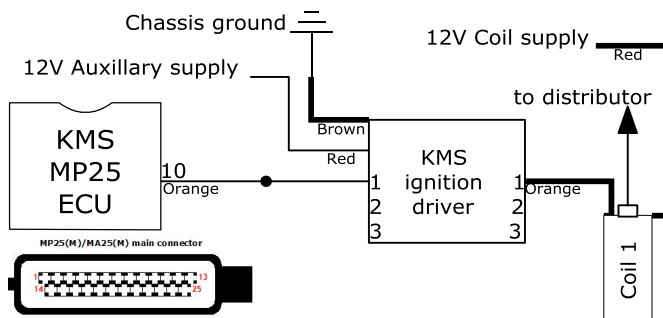


3.3.2 3 cyl. single coils (with amplifier), firing order: 1-2-3

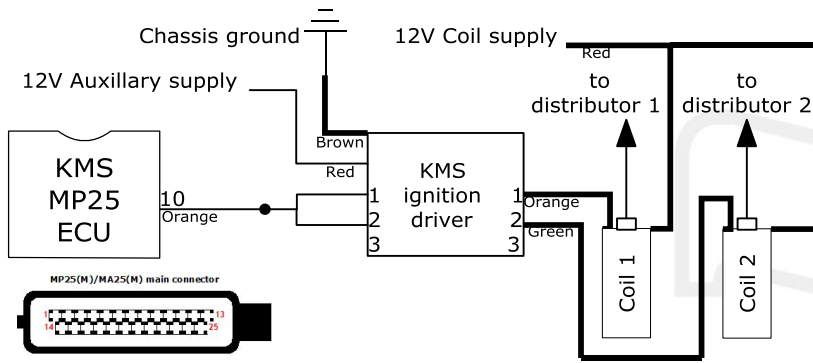


3.4 4 cylinder engines

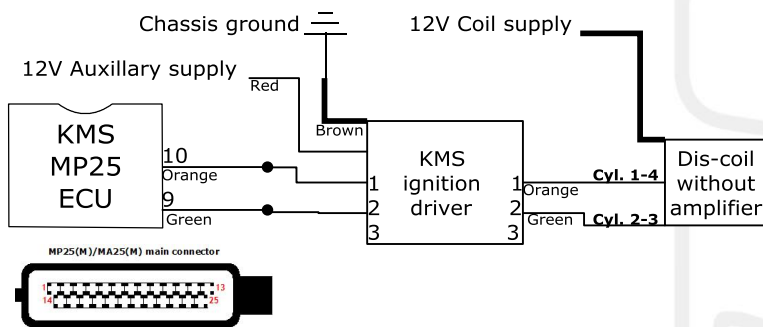
3.4.1 Single coil, single distributor (without amplifier)



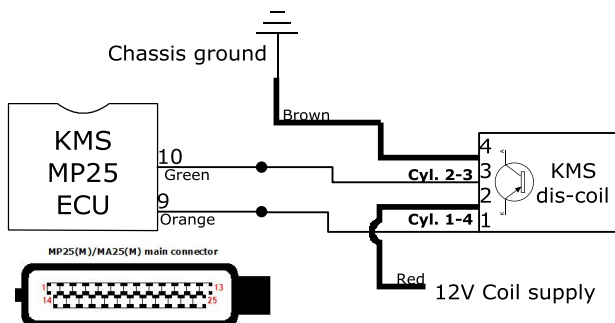
3.4.2 Twin coil, twin distributor (without amplifier)



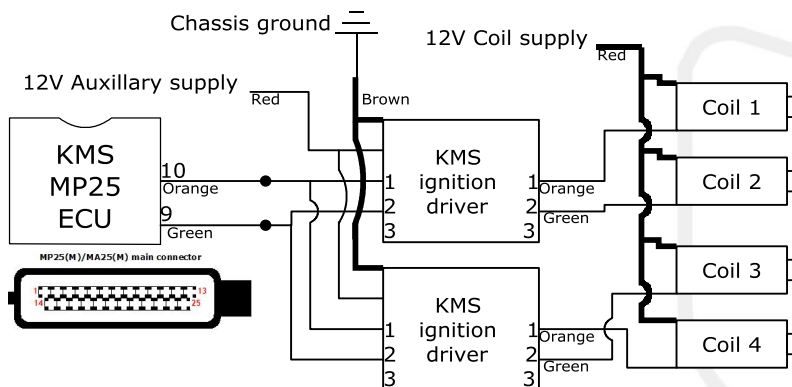
3.4.3 4 cyl. dis-coil (without amplifier), firing order: 1-3-4-2



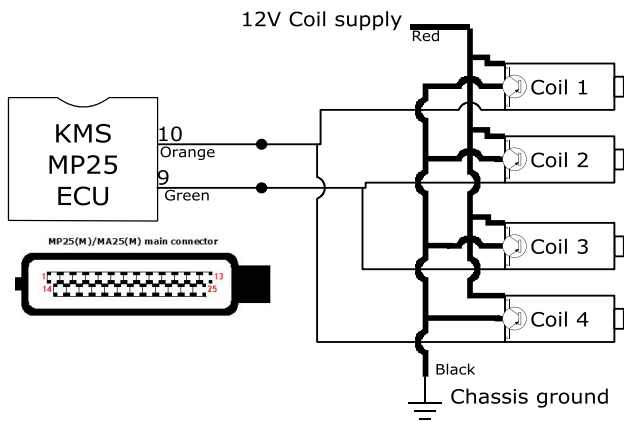
3.4.4 4 cyl. dis-coil (with amplifier), firing order: 1-3-4-2



3.4.5 4 cyl. single coils (without amplifier), firing order: 1-3-4-2

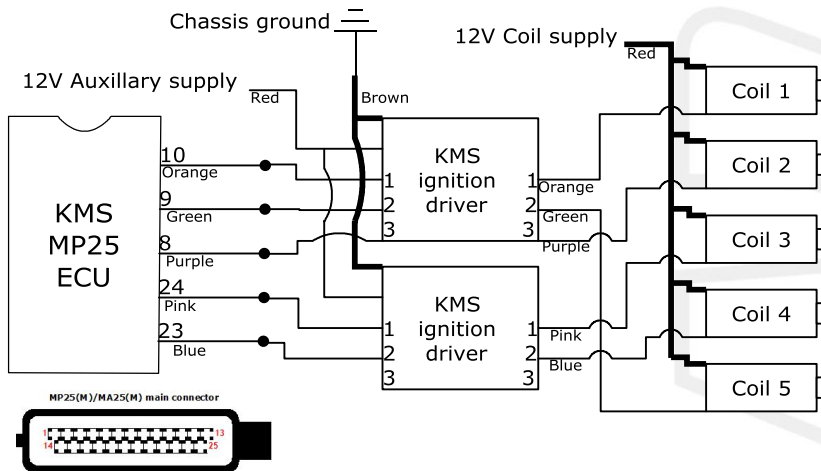


3.4.6 4 cyl. single coils (with amplifier), firing order: 1-3-4-2

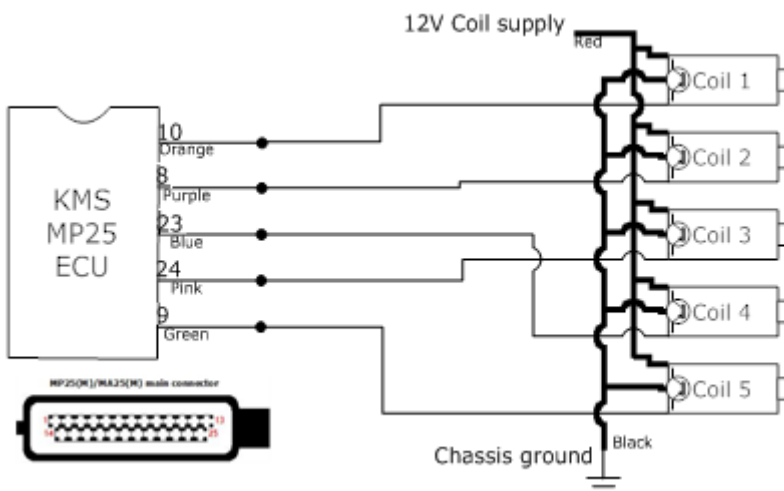


3.5 5 cylinder engines

3.5.1 5 cyl. single coils (without amplifier), firing order: 1-2-4-5-3

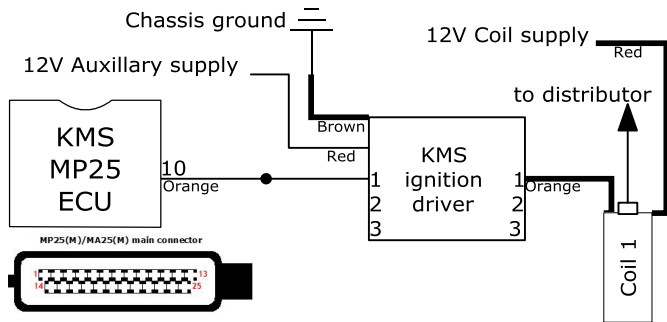


3.5.2 5 cyl. single coils (with amplifier), firing order: 1-2-4-5-3

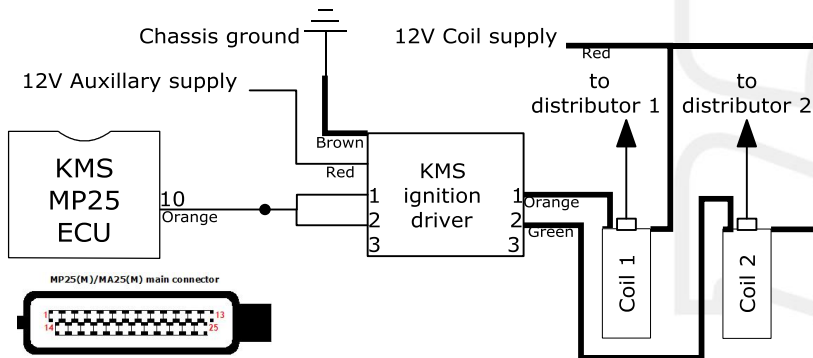


3.6 6 cylinder engines (120° ignition angle only)

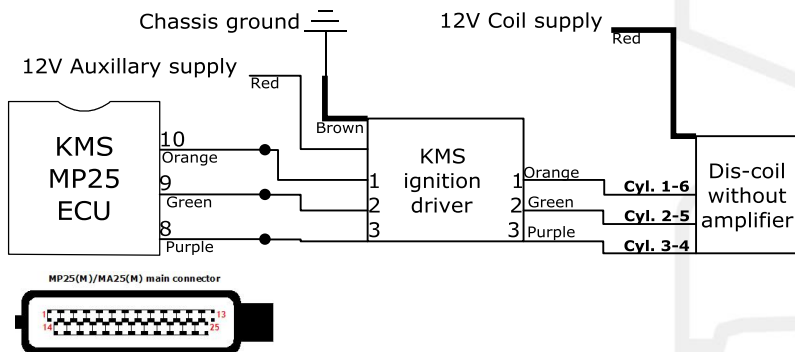
3.6.1 Single coil, single distributor (without amplifier)



3.6.2 Twin coil, twin distributor (without amplifier)



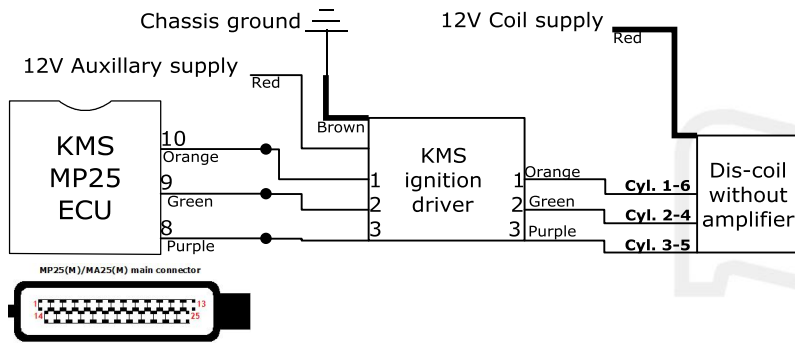
3.6.3 6 cyl. line dis-coil (without amplifier), firing order: 1-5-3-6-2-4



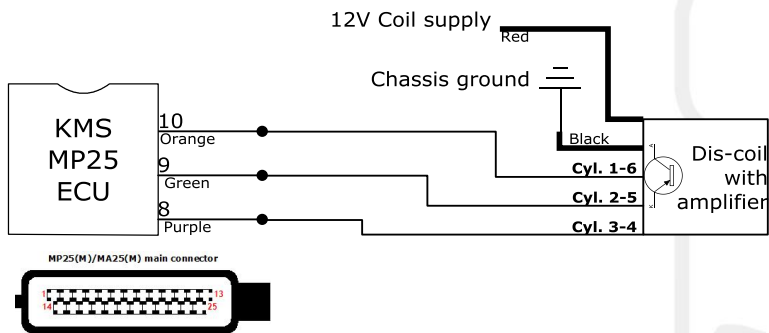
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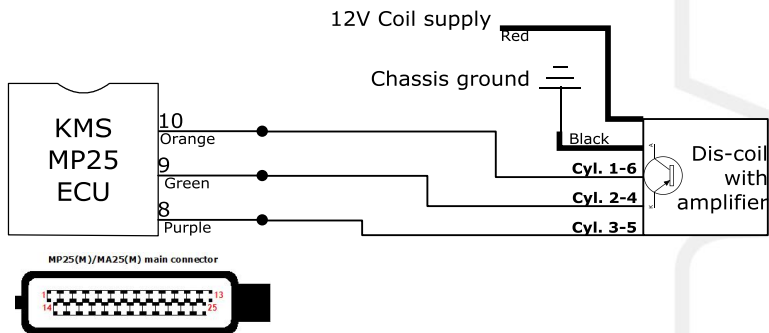
3.6.4 V6 dis-coil (without amplifier), firing order: 1-4-3-6-2-5



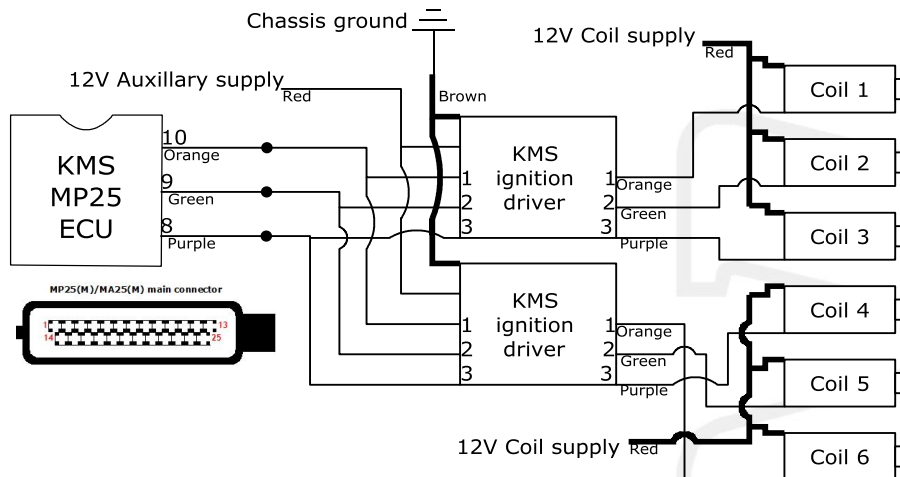
3.6.5 6 cyl. line dis-coil (with amplifier), firing order: 1-5-3-6-2-4



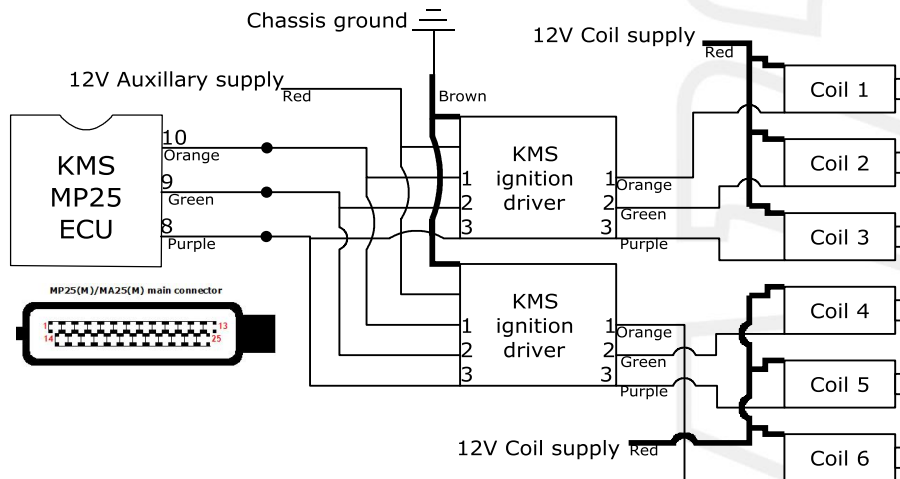
3.6.6 V6 dis-coil (with amplifier), firing order: 1-4-3-6-2-5



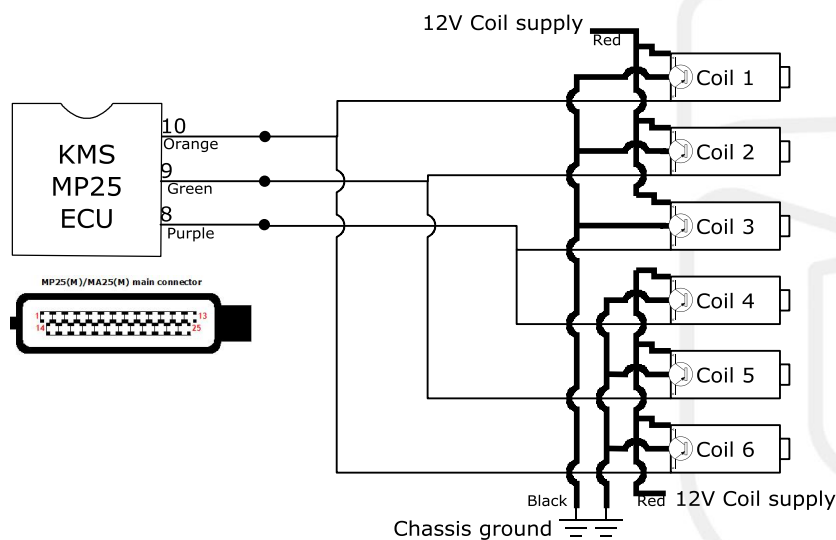
3.6.7 6 cyl. line single coils (without amplifier), firing order: 1-5-3-6-2-4



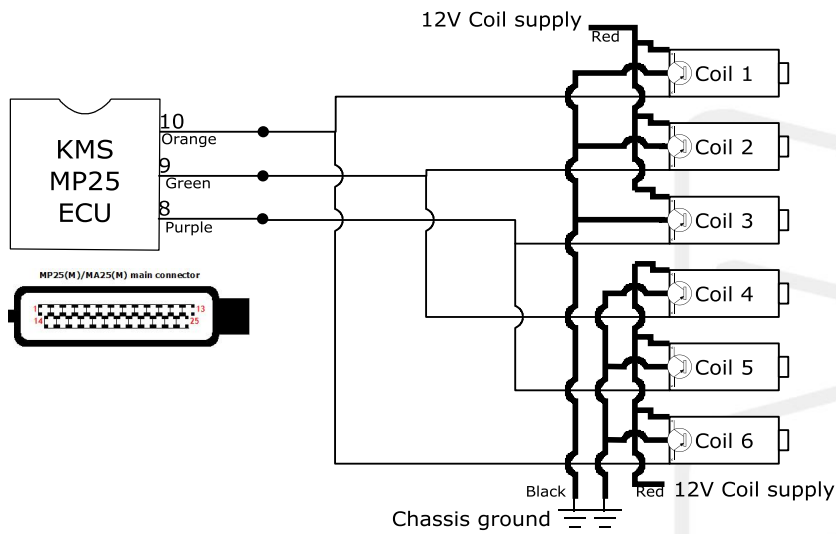
3.6.8 V6 single coils (without amplifier), firing order: 1-4-3-6-2-5



3.6.9 6 cyl. line single coils (with amplifier), firing order: 1-5-3-6-2-4

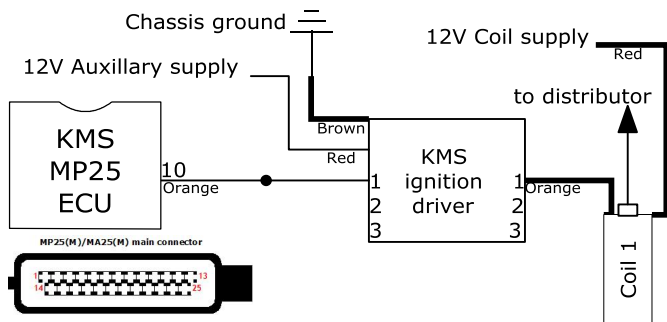


3.6.10 V6 single coils (with amplifier), firing order: 1-4-3-6-2-5

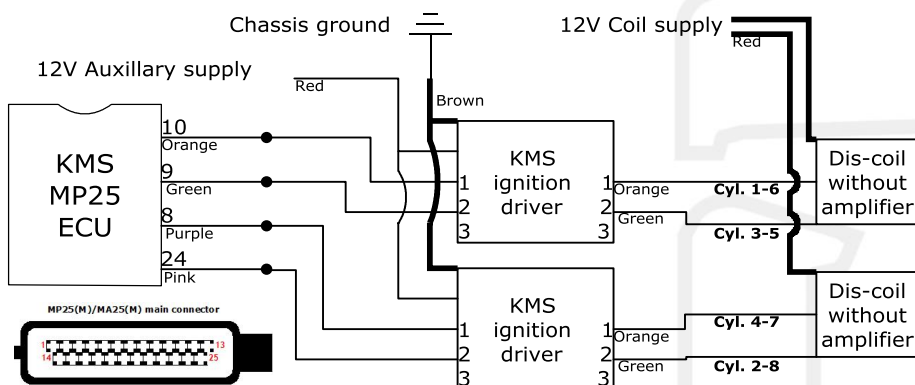


3.7 8 cylinder engines

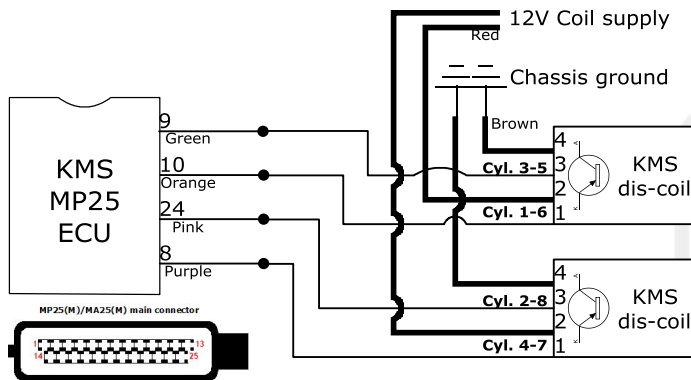
3.7.1 Single coil, single distributor (without amplifier)



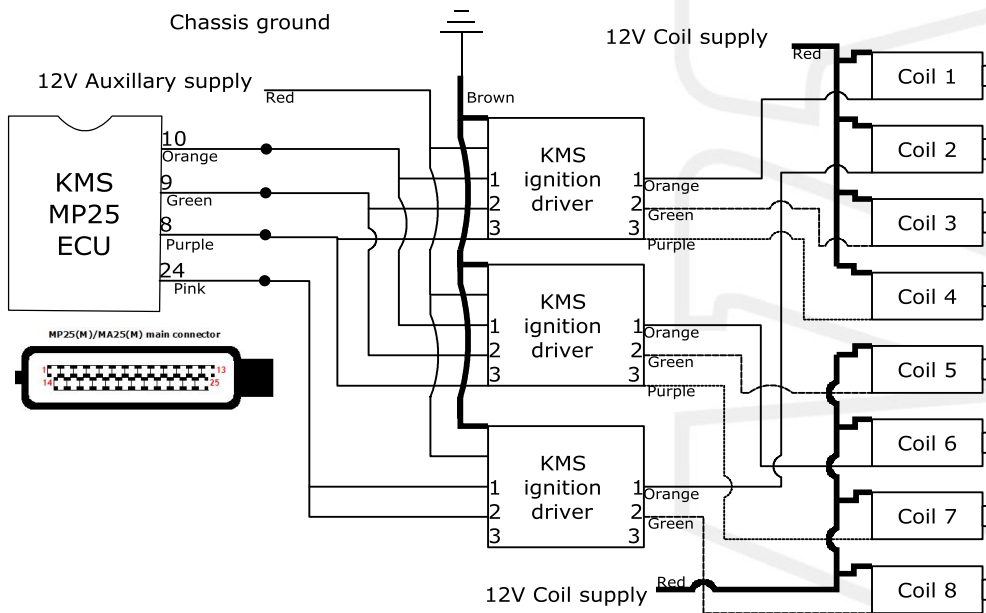
3.7.2 V8 dis-coils (without amplifier), firing order: 1-5-4-8-6-3-7-2



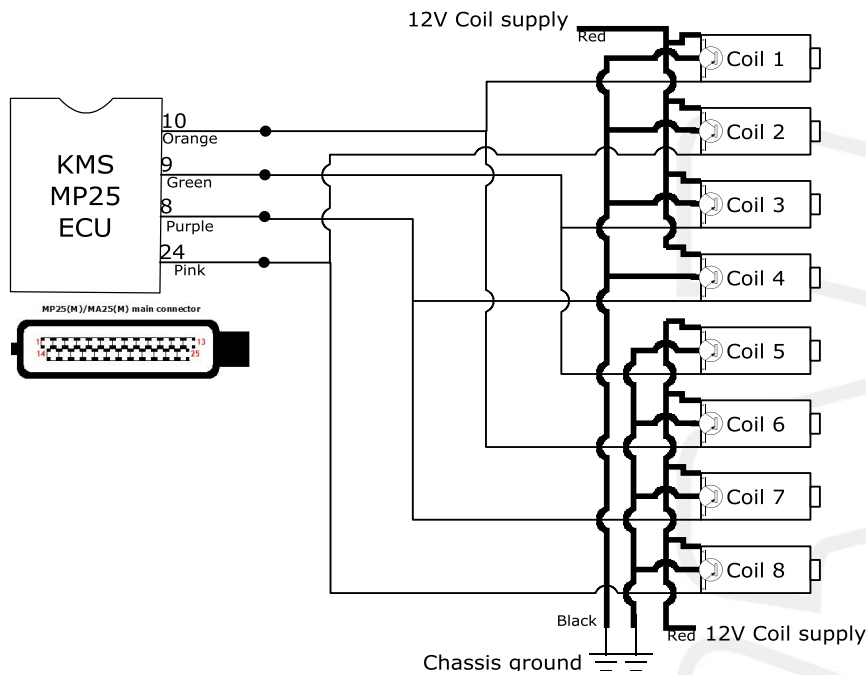
3.7.3 V8 dis-coils (with amplifier), firing order: 1-5-4-8-6-3-7-2



3.7.4 V8 single coils (without amplifier), firing order: 1-5-4-8-6-3-7-2

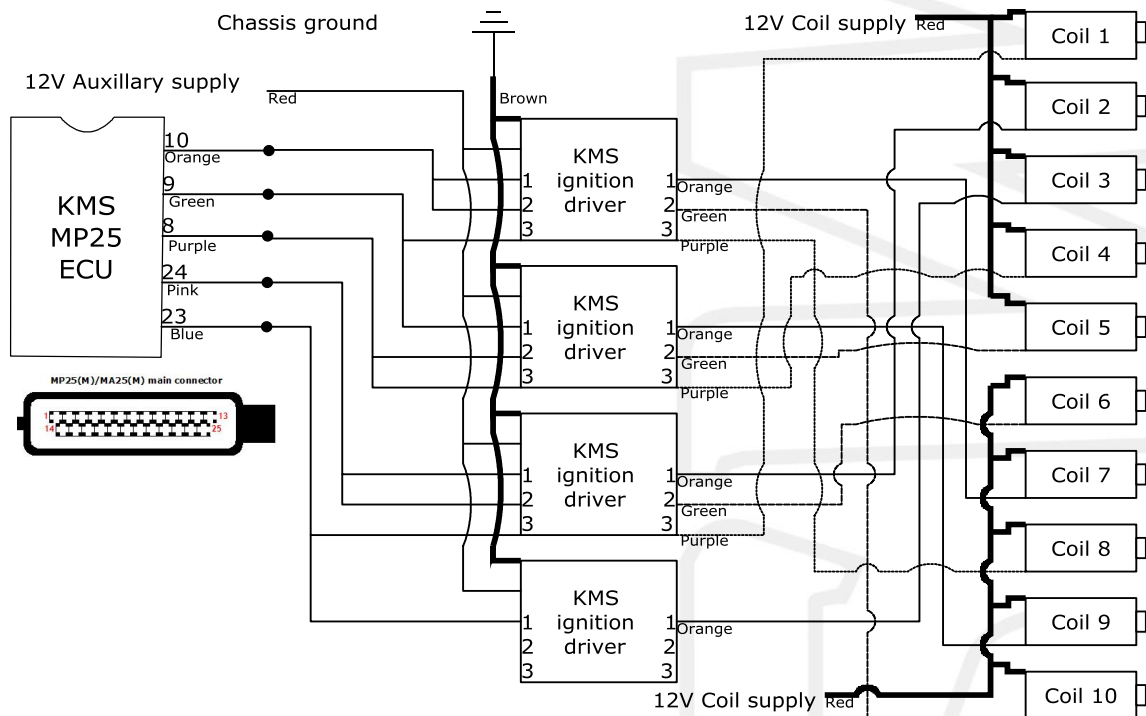


3.7.5 V8 single coils (with amplifier), firing order: 1-5-4-8-6-3-7-2

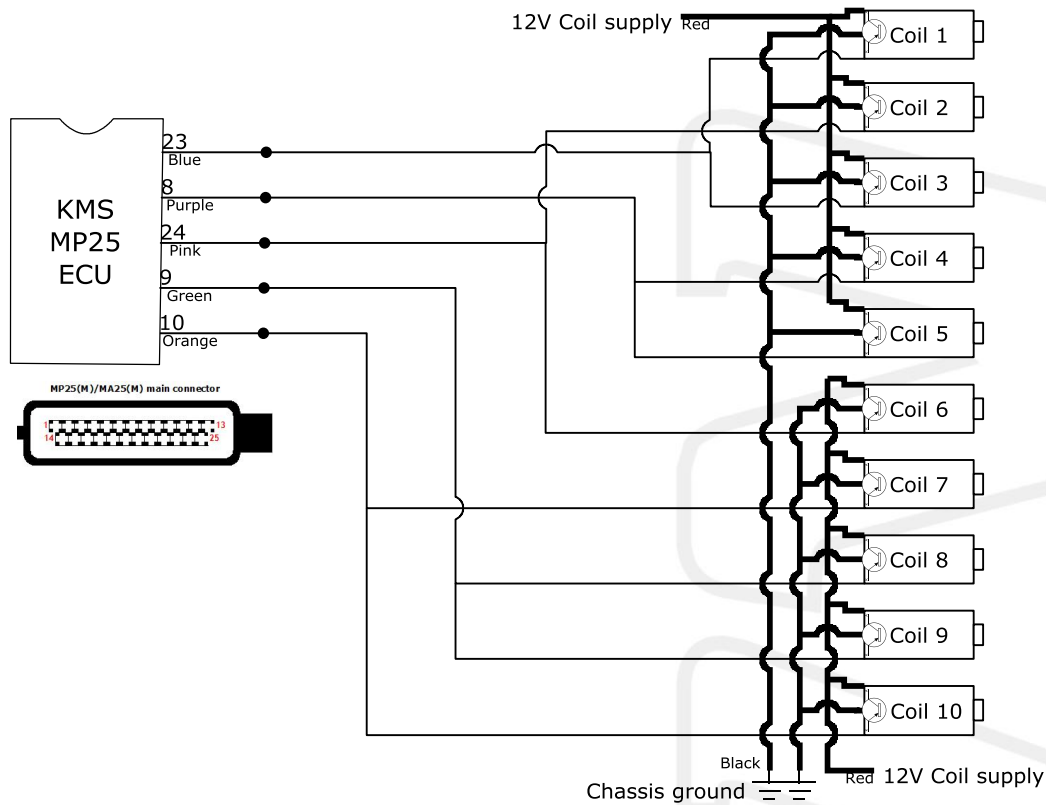


3.8 10 cylinder engines (equal firing angles: 72°)

3.8.1 V10 single coils (without amplifier), firing order: 7-8-5-2-1-10-9-4-6-3

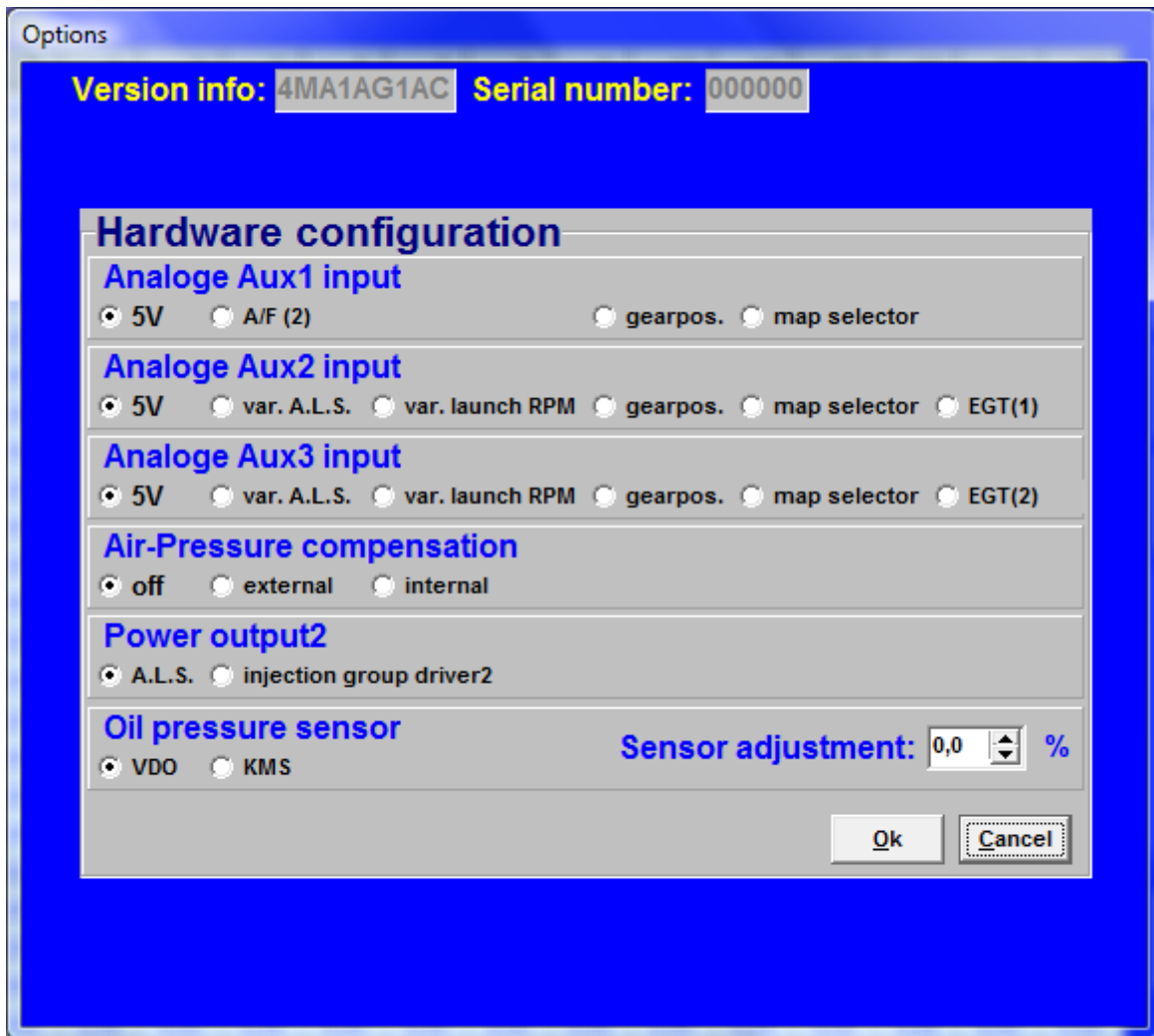


3.8.2 V10 single coils (with amplifier), firing order: 7-8-5-2-1-10-9-4-6-3



4 Appendix B2: Analog aux wiring

The analog aux inputs and outputs can be used for different functions. The chosen functions must be set correctly in the software for each application. When you are in the main screen of the software program, go to 'options (F4)' and then 'hardware configuration'. The following screen will appear.



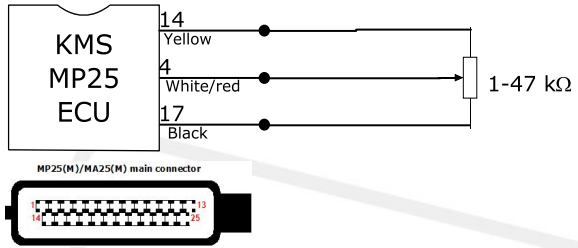
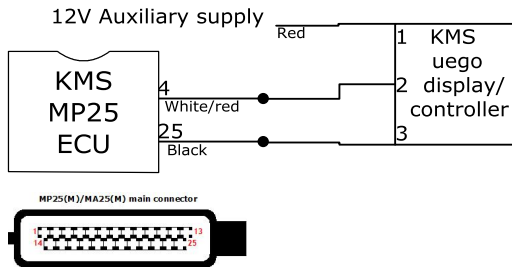
Here the different functions for the analog input and outputs can be defined, depending on the way the different functions are connected/wired. The connection/wiring of the in- and outputs for different functions are shown in the wiring diagrams on the following pages.

Note: When using one or more auxiliary outputs (aux 1 and/or 2 out) for the ignition system, it's not possible to use these outputs for other functions. For wiring of auxiliary 1 and 2 outputs as ignition outputs, see appendix B1.

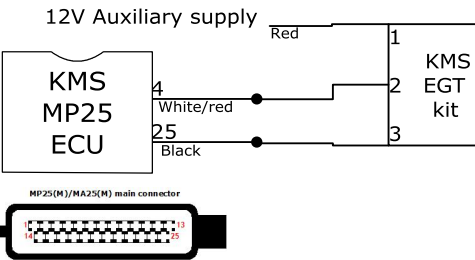
4.1 Analog aux input

Analog aux in: A/F

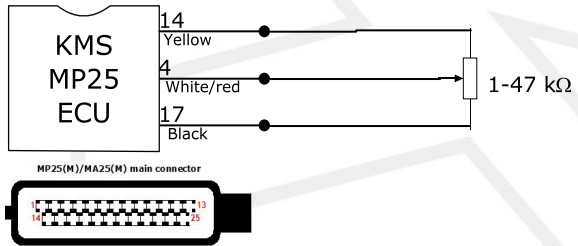
Analog aux in: Var. A.L.S. / Var. launch RPM



Analog aux in : EGT



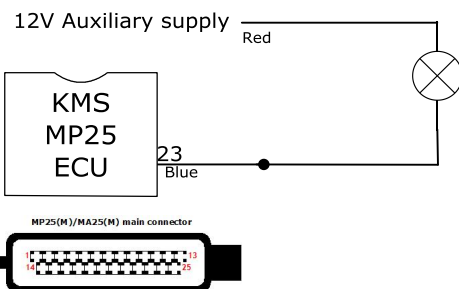
Analog aux in: Gear position



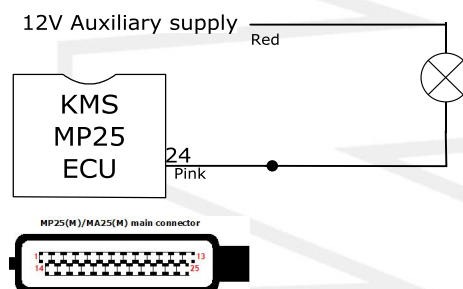
4.2 Auxiliary (aux) outputs

Warning: Maximum current: 1A!!! If a higher current is needed, a relay should be used.

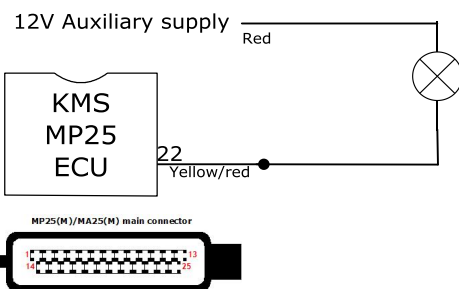
Aux out 1 : Diagnostic out



Aux out 2: Diagnostic out

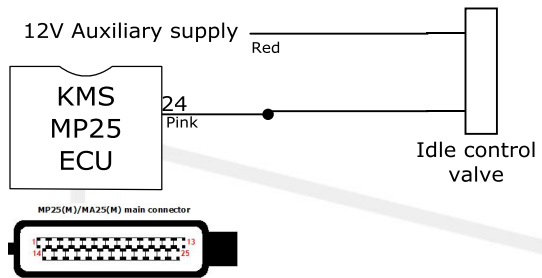
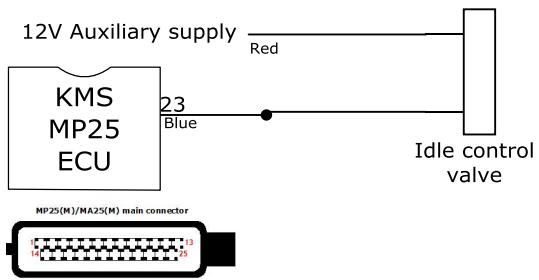


Aux out 3: Diagnostic out

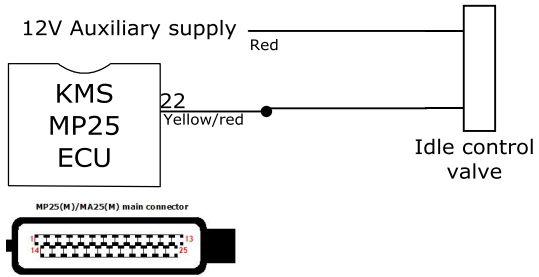


Aux out 1: Idle control

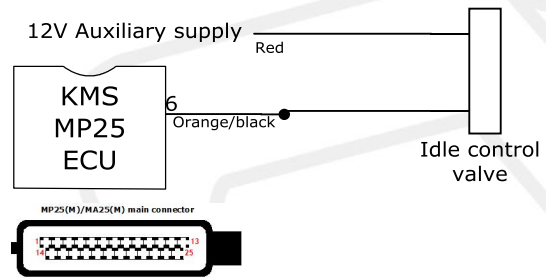
Aux out 2: Idle control



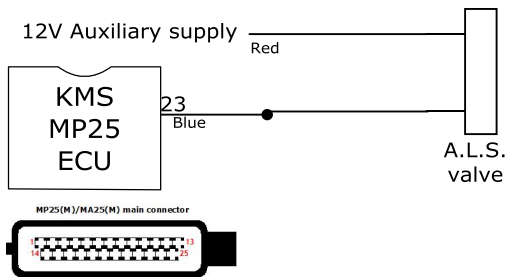
Aux out 3: Idle control



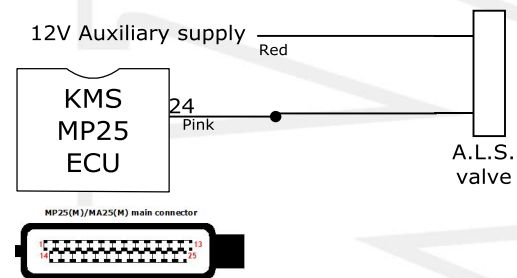
Boost control output: Idle control



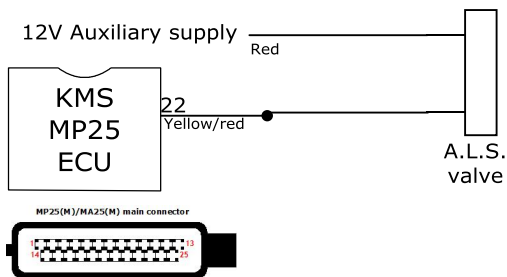
Aux out 1: A.L.S.



Aux out 2: A.L.S.



Aux out 3 : A.L.S.



Aux out 1, 2, 3 : Diverse

The analog auxiliary outputs can also be used to direct many other applications such as NOS, cooling fan, shiftlight, variabel inlet systems, cam control, water injection, etc. The following diagram describes the general wiring of these systems, however some applications may deviate from this diagram.

