MKPS
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TECHNICAL LETTER N°2

Subject:

YMS

Yamaha Matching System

"First approach : functions presentation"

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Introduction

YEC Kit ECU presented on the Technical Letter n°1 i s developed to communicate with a computer software called YMS : Yamaha Matching System.

This software offer the possibility to adjust several parameters. This is particularly interesting to set up ECU to the engine specifications and to optimise engine performances with track conditions.

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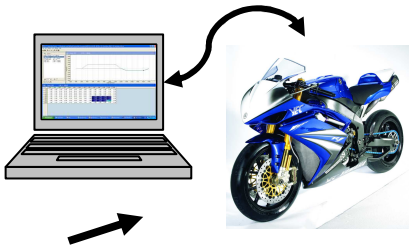
YMS Functions



- ❑ Communication to ECU with USB interface
- ❑ Injection MAP
- ❑ Ignition MAP
- ❑ ETV Control (Engine brake control)
- ❑ Shifter timing
- ❑ Pit road limiter
- ❑ Gear box ratio parameters

Those functions allow to correct the internal ECU data. The internal ECU mapping is fixed by YEC, meanwhile Yamaha Matching System offer the possibility to apply an offset to the base data. By this way, it become easy and possible to combine perfectly ECU with bike specifications.

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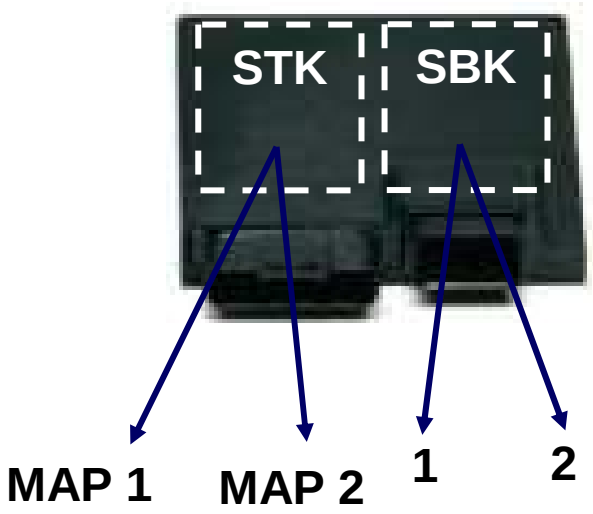
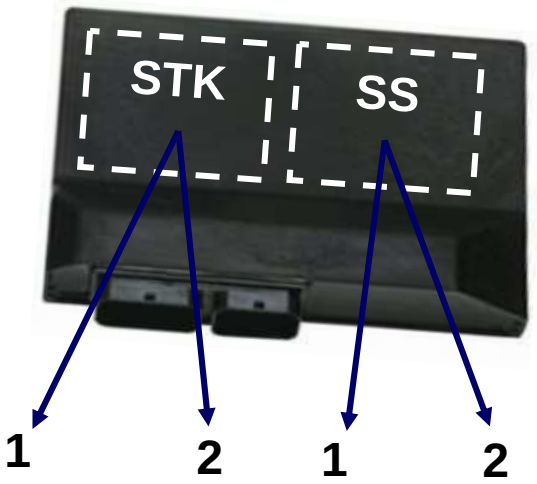
First step : select the base MAP

As indicated in the previous Technical letter, ECU proposes two base mapping. Basically SBK/STK or SSP/STK (The choice is given by the engine specification and achieved by the position of a loop on a coupler => TL n°1) **.**

Additionally, **Y**amaha **M**atching **S**ystem **controls two complementary MAP** switchable from the handle bar (left side). The switch to select MAP 1 or MAP 2 is delivered with the kit wire harness set. MAP 1 et MAP 2 are usable on Fuel and Ignition MAP.





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Select MAP coupler

STK MAP

SS or SBK MAP

MAP 1

MAP 2

MAP 1

MAP 2

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Second step : connection and communication with ECU

Computer is connected to the ECU through the Cable Interface (USB). The cable is connected to the kit wire harness on a coupler situated behind the dashboard.

Start YMS software and adjust communication port if necessary (YMS Menu : Toll \ Com… : Auto Select or Manual Select from Windows com port information)

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Summary

- ***Shifter / Cut time***
- ***Fuel MAP 1&2***
- ***Ignition MAP 1&2***
- ***ETV Control***
- ***Constant parameters***
- ***Write and read ECU***

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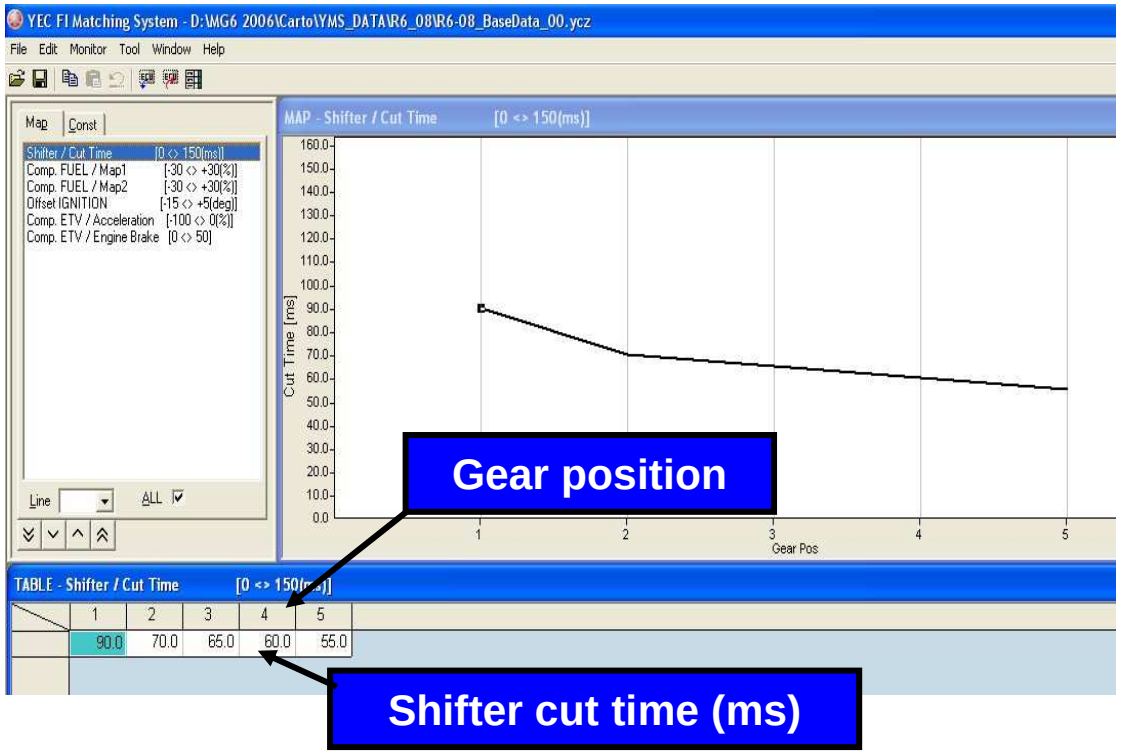
Shifter / Cut time

The value placed by default in the ECU fit a basic kit bike. Basically, it is not necessary to change this parameter. Meanwhile, depending of rider experience, it may become necessary to change the value.

CAUTION : If you need to change, modify the value by small steps (5ms maximum) to avoid any damage on gears.



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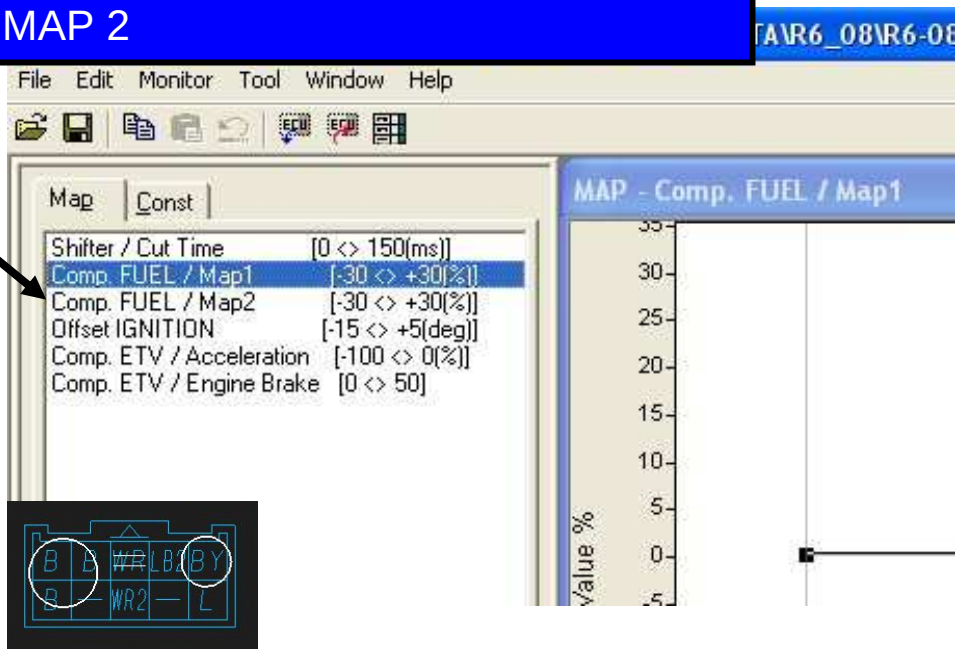
Fuel Map 1 & 2

Kit wire harness offers the possibility to use either standard Dimmer switch or dedicated switch to select the MAP.

With standard left switch, the selection MAP is assigned on the Dimmer switch

Low position = MAP 1

High position = MAP 2



Two injection MAP:

Map 1 : switch open

Map 2 : switch close

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TL n°2

Setting Fuel Map 1 & 2

To adjust correctly the Fuel MAP, we recommend to combine kit wire harness with a data acquisition system. By this way it become possible to adjust correctly the Air / Fuel ratio.

For both bike R1 and R6, A/F target should be around :

- **A/F target on opening throttle between 12 & 12.5**
- **A/F target on full gas between 12.8 AND 13.3**

If you don't use MAP1 & MAP2 function, you should set both MAP with same values in order to avoid any malfunction in switching error.

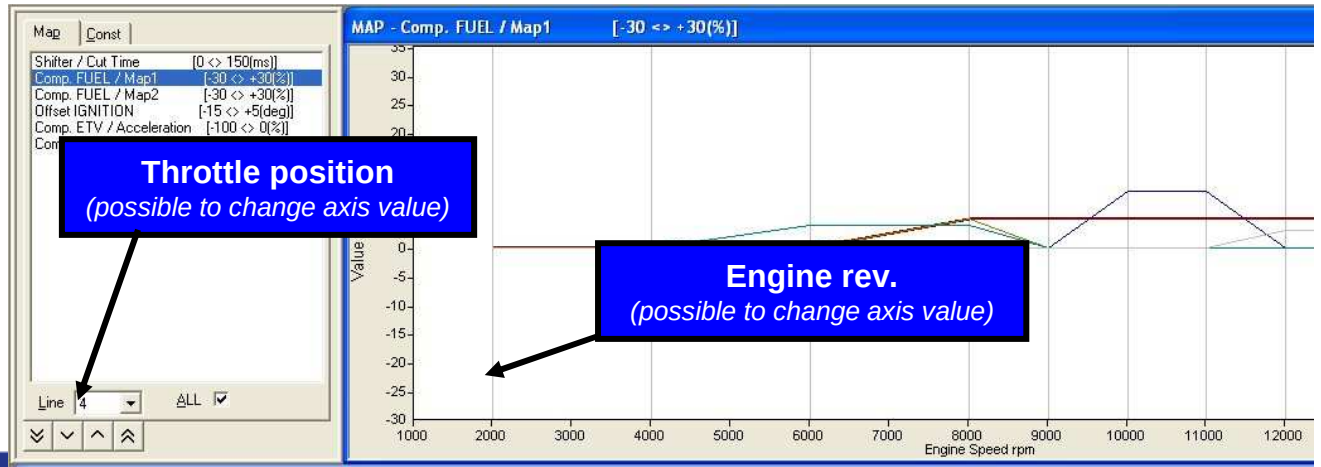

TABLE - Comp. FUEL / Map1 [-30 <> +30(%)]

	2000	4000	6000	8000	9000	10000	11000	12000	13000	14000	15000	15500
2	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	5	5	5	5	5	5	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	5	0	10	10	0	0	0	0	0
25	0	0	0	0	0	10	10	0	0	0	0	0
50	0	0	4	4	0	0	0	0	0	0	0	0
75	0	0	4	4	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	3	3	3	-4	-4

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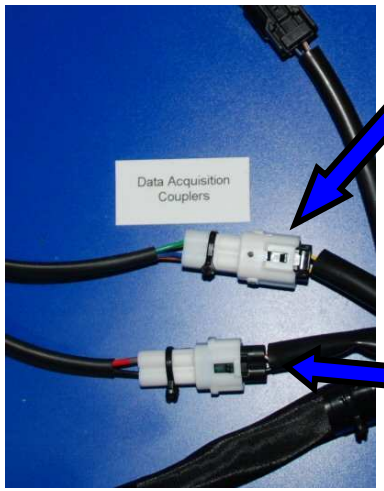
To set up A/F ratio in the best conditions, It is necessary to add a data logging system on the bike



A coupler (4 pins) is available on the kit Wire Harness to get information from the bike :

- Throttle position
- Engine revolution
- Water temperature
- Gearbox speed sensor

Two pins : data logger power supply

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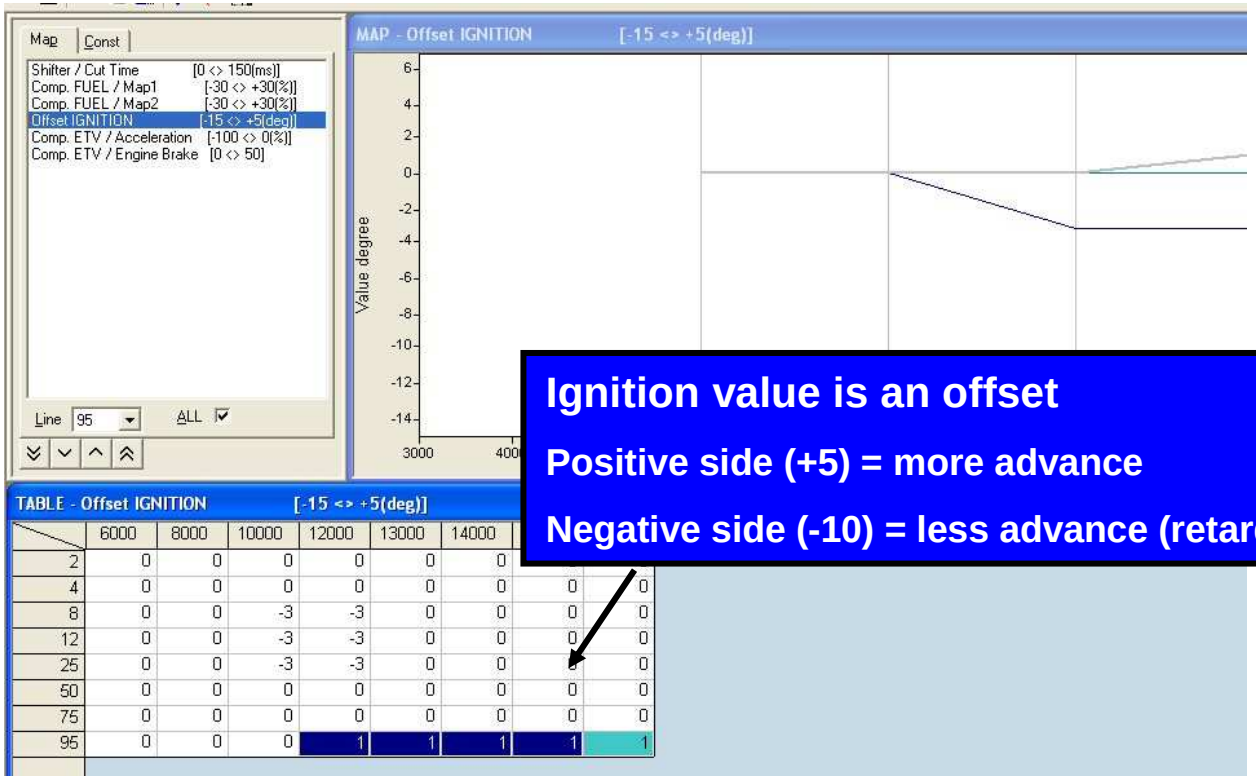
Ignition Map 1 & 2

YMS file deliver in 2009 two Ignition MAP for R1 and one for R6.

The standard data « 0 » in YMS file is provided for a basic kit bike STK, SS or SBK. The parameter in the Ignition MAP is an offset from internal base MAP (from -10 to +5 degrees)

CAUTION : excessive advance may damage the engine



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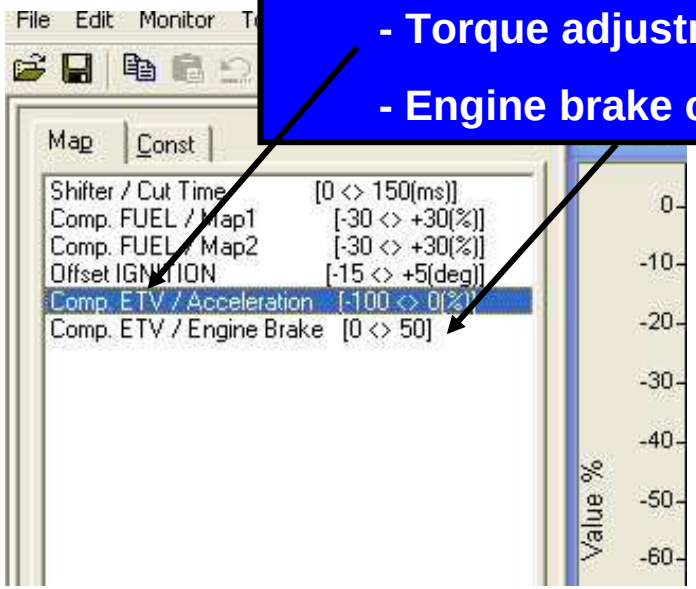
ETV (Electric Throttle Valve) Control

Both models R1and R6 present a different ETV control. R6 (2009) kit propose *Comp ETV / Acceleration* and *Comp ETV / Engine Brake*. While R1 (2009) using *compensate ETV / Engine Brake (the most useful).*

Two dedicated MAP for ETV (only R6)

- **Torque adjustment on Acceleration area**
- **Engine brake control & adjustment**



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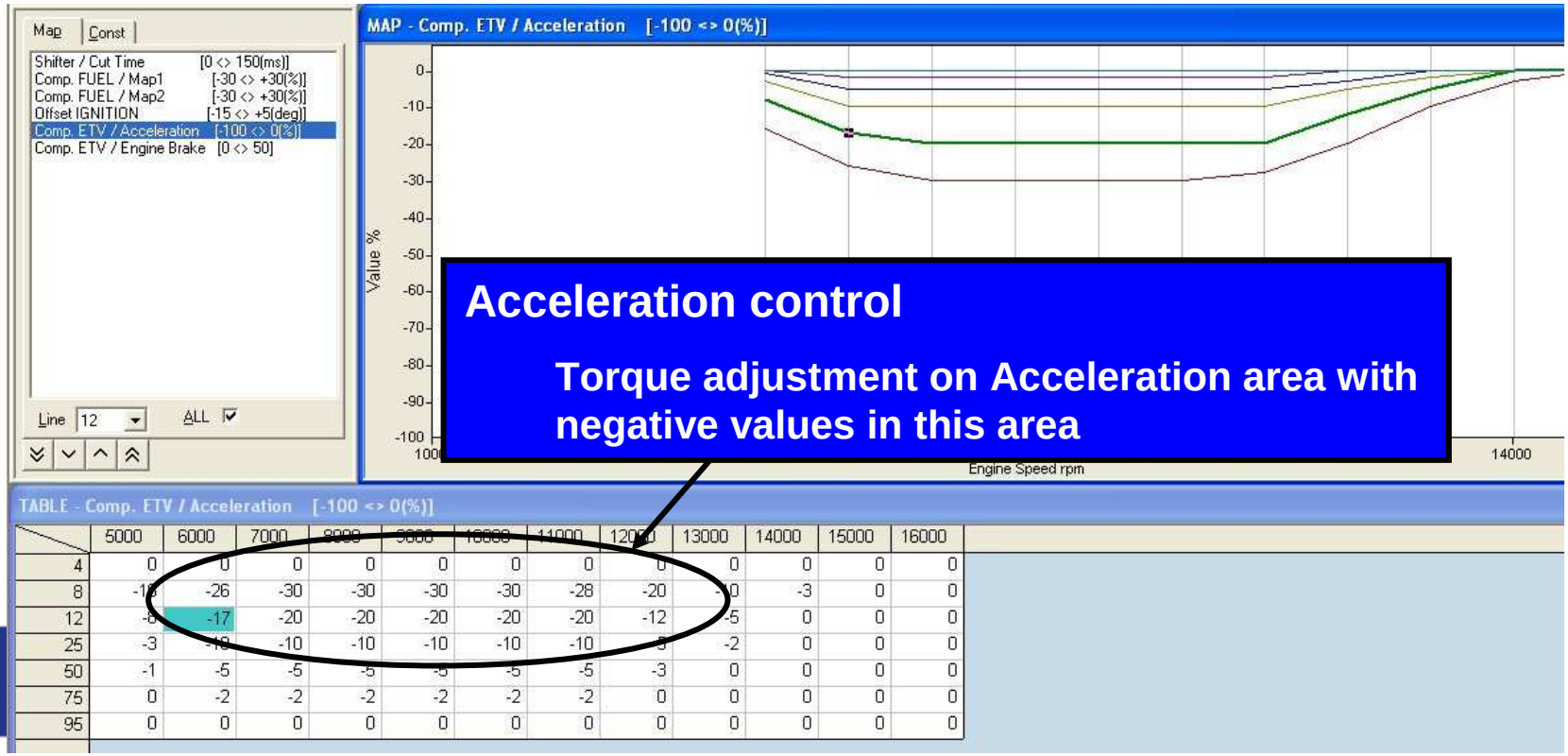
ETV / Acceleration control

This function manages acceleration area. With negative values as mentioned below, the engine character can be soften. This table can be used when the engine is “aggressive” on opening throttle and on acceleration area.



	5000	6000	7000	8000	9000	10000	11000	12000	13000	14000	15000	16000
4	0	0	0	0	0	0	0	0	0	0	0	0
8	-10	-26	-30	-30	-30	-30	-28	-20	-10	-3	0	0
12	-5	-17	-20	-20	-20	-20	-20	-12	-5	0	0	0
25	-3	-10	-10	-10	-10	-10	-10	-5	-2	0	0	0
50	-1	-5	-5	-5	-5	-5	-5	-3	0	0	0	0
75	0	-2	-2	-2	-2	-2	-2	0	0	0	0	0
95	0	0	0	0	0	0	0	0	0	0	0	0

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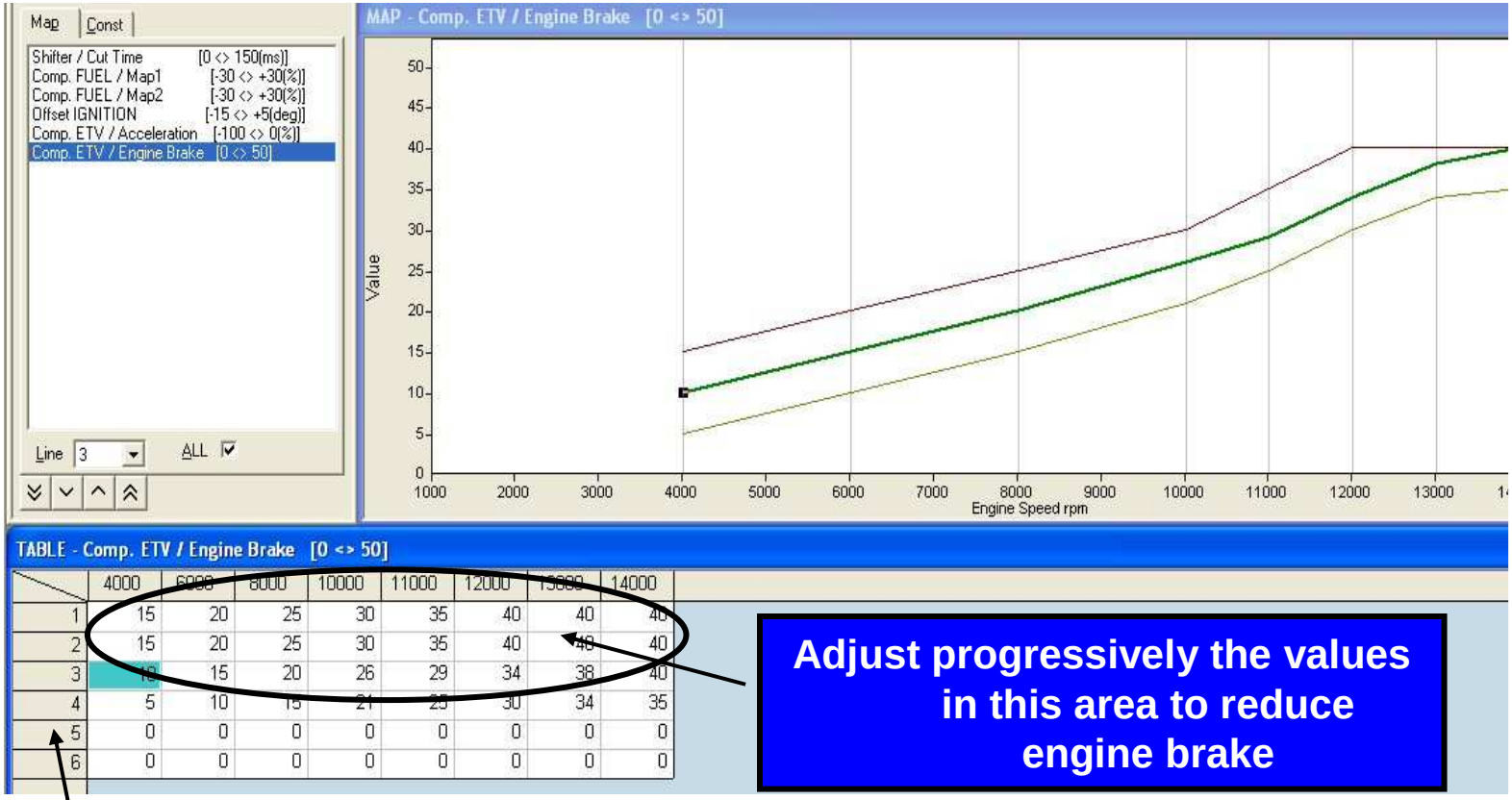
ETV / Engine Brake Control

The most useful function of ETV is the *Engine Brake control*. Through the revolution and the gears, rider can adapt the bike to his riding style.



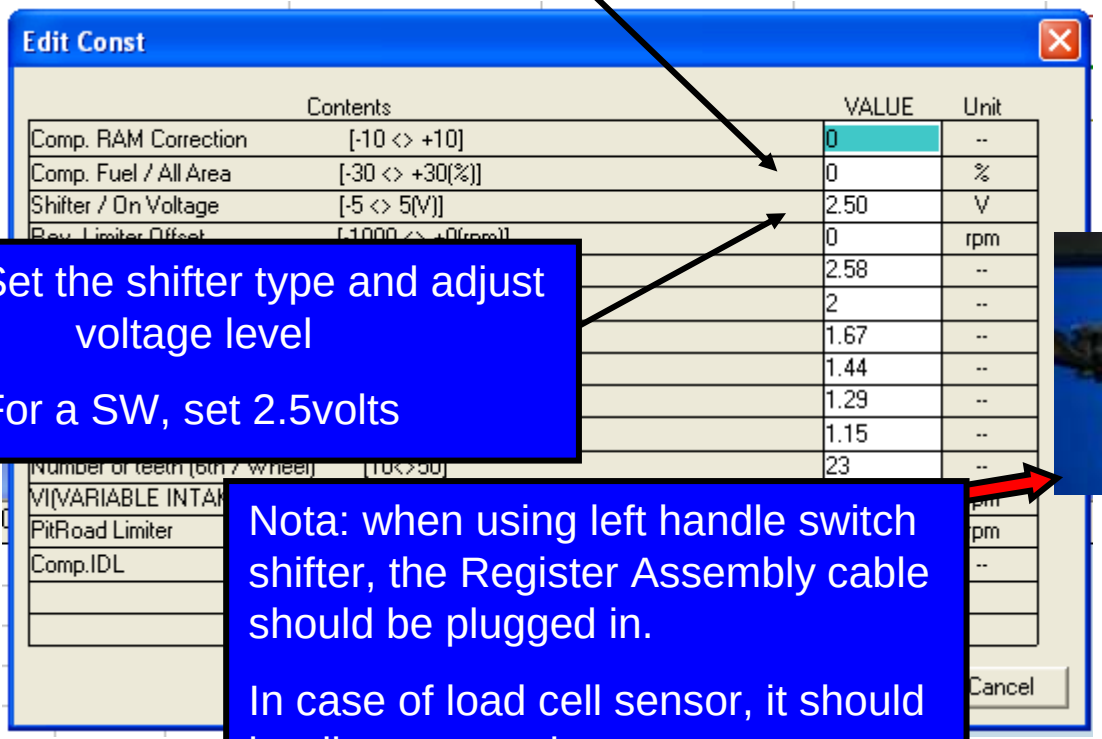
Constant Parameters table

A table of Constant Parameters *"Edit Const"* is used in YMS to set up several parameters such as pit road limiter; shifter type, gear box ratio, Variable Intake, … Those parameters should be fill in properly in order to have a kit system working in the best conditions.

Fuel offset on all area

Set the shifter type and adjust voltage level

For a SW, set 2.5volts

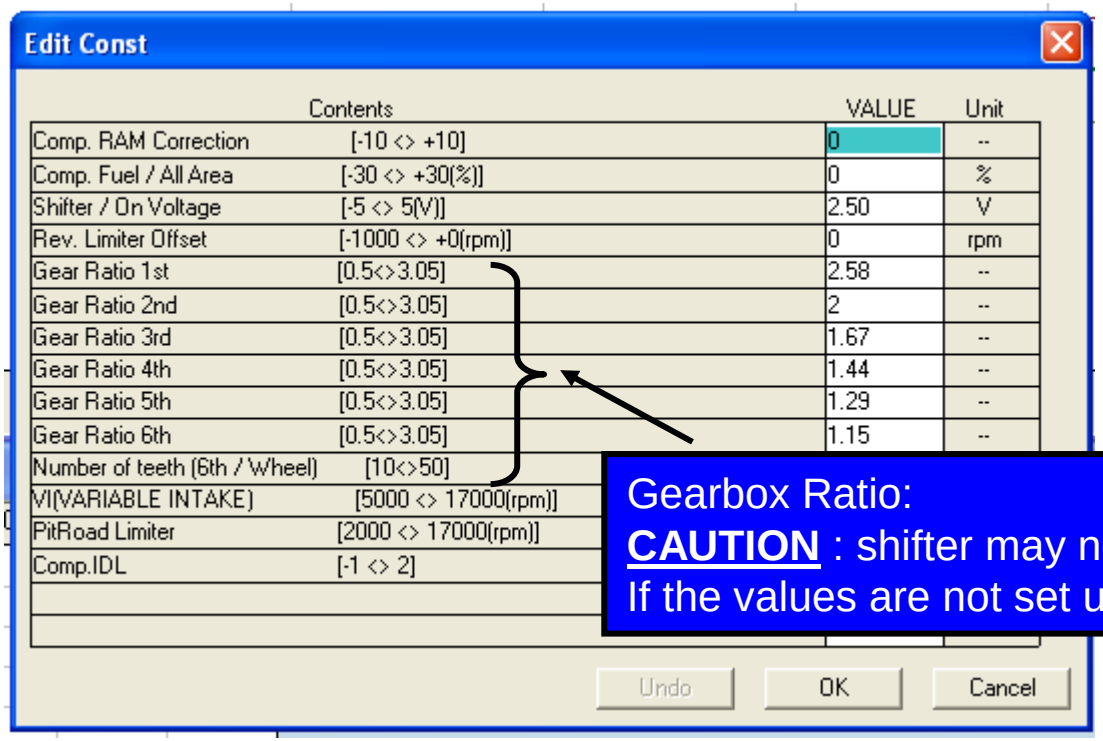


Nota: when using left handle switch shifter, the Register Assembly cable should be plugged in.

In case of load cell sensor, it should be disconnected.

Constant Parameters table

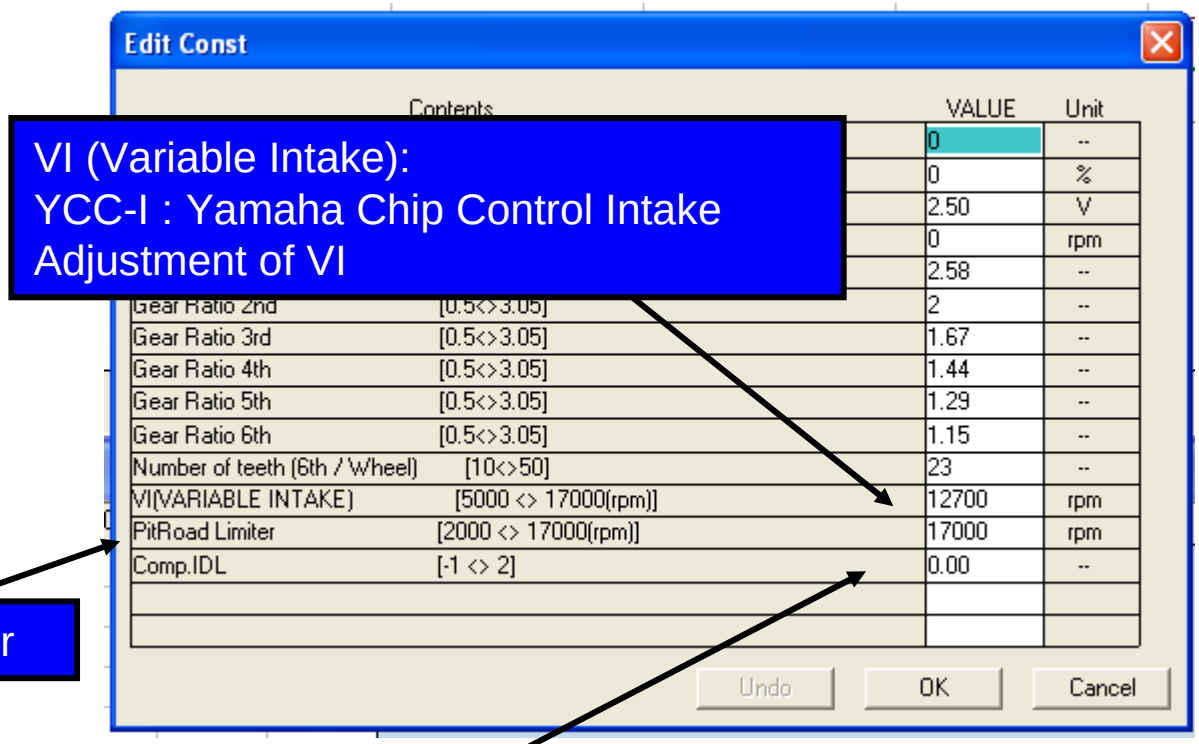
In case of incorrect gear ratio, it may be possible that the quick shifter will not work properly as the system can not recognise the gear position. The gear ratios are available in kit manual book.



Gearbox Ratio:
CAUTION : shifter may not work properly
If the values are not set up correctly

Constant Parameters table

Pit road Limiter is available in Edit constant table. This function work with a dedicated switch and operate on first and second gears. To determine properly the pit road limiter, we suggest you to refer to FI Matching system Manual.



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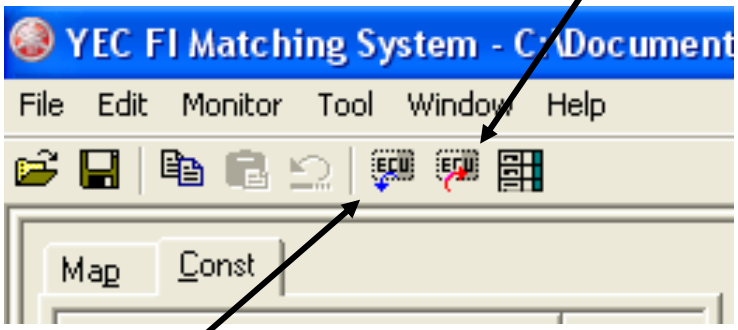
Write and Read in the Kit ECU

Write data from the computer to the ECU *(connect computer to the bike and switch on)*



Read data from ECU *(connect computer to the bike and switch on)*

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YMS file and ECU reference

YMS data file work with same generation of ECU. Don't mix them to avoid any dysfunction.

Year / Model	R1	ECU ref. number
2009	R1-09_BaseData_00	14B-8591A-70
2008	R1-08_BaseData_00	4C8-8591A-80
2007	R1-07_BaseData_00	4C8-8591A-70

Year / Model	R6	ECU ref. number
2009	R6-09_BaseData_00	2C0-8591A-90
2008	R6-08_BaseData_00	2C0-8591A-80
2007	R6-07_BaseData_00	2C0-8591A-71
2006	R6-06_BaseData_00	2C0-8591A-70

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Next month,

the Technical letter n°3 will tackle about some met hods to set up ECU MAP and parameters with **Yamaha Matching System** software.

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