TECHNICAL LETTER N°1

Subject:

Kit ECU

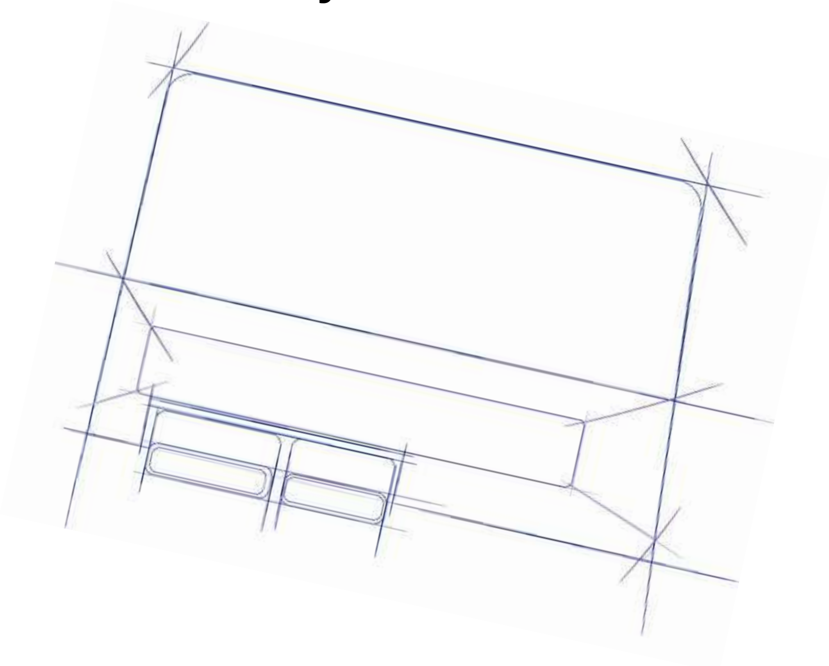
Electronic **C**ontrol **U**nit

TL n°1

Generality

Kit ECU are developed around the **same hardware** as production bike.

Meanwhile, ECU pin out is different as production version and Kit ECU combine **exclusively** with kit wire harness.



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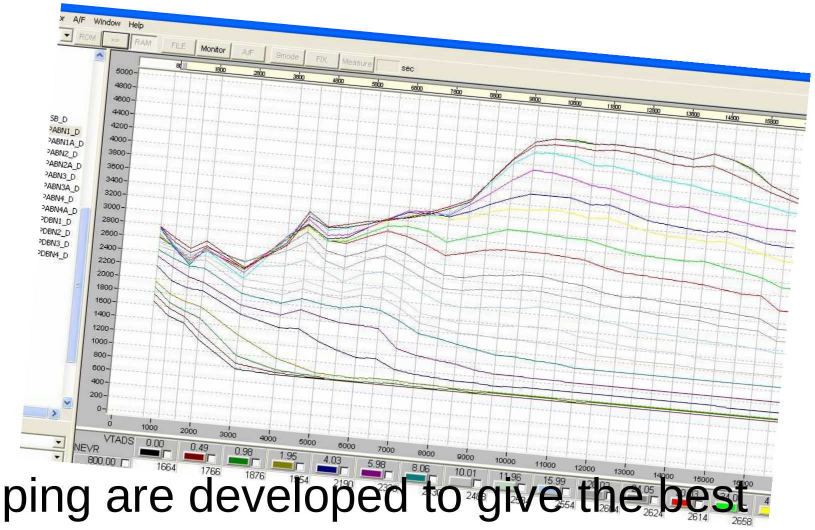
Functions

ECU controls and manages the main following parameters:

- ❑ Injection
- ❑ Ignition
- ❑ Throttle
- ❑ Shifter
- ❑ Pit road limiter
- ❑ Engine brake



Those parameters called mapping are developed to give the best performance to the engine. A long and fastidious battery of tests are achieved to develop the kit ECU. The final ECU mapping is defined after several engine dyno tests, chassis dyno and track tests condition.

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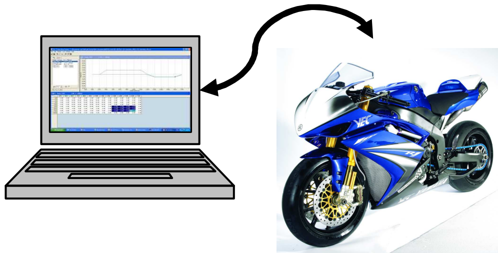
Internal ECU parameters are fixed but users may adjust few parameters through the **Yamaha Matching system**. This software communicates with ECU. This possibility is given to adjust parameters in order to match and combine with the specificities of team bike.

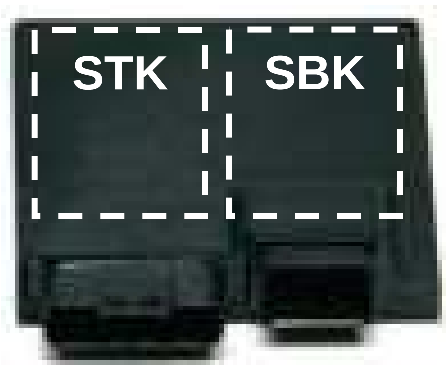
Basically, internal ECU data **match in any conditions** with a wide variety of specifications



Inside ECU, there is **two mapping**

- ❑ One concerns the Stocksport (STK) condition *(basically standard engine or very near).*
- ❑ The second one concerns Supersport (SS) condition for R6 and Superbike (SBK) condition for R1.

Supersport and Superbike condition means FIM engine regulation (such as camshafts, air funnels, pistons, compression ratio, …)



Racing teams can select the mapping that match with their engine specifications. It is possible with a small electric loop on the racing kit wire harness.

This coupler is located on the left side of the bike near the front fork leg.

Loop condition	R1	R6
Plug	Superbike	Supersport
Unplug	Stocksport	

Wire harness is delivered with the loop connected. When the loop is plugged, it is Supersport or Superbike mapping. Unplugged, it is Stocksport regulation.

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TL n°1

The ECU reference numbers

Year / Model	R1
2010	14B-8591A-71
2009	14B-8591A-70
2008	4C8-8591A-80
2007	4C8-8591A-70
2004-2006	5VY-8591A-72

Year / Model	R6
2010	2C0-8591A-91
2009	2C0-8591A-90
2008	2C0-8591A-80
2007	2C0-8591A-71
2003-2005	5SL-8591A-80

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Next month,

the Technical letter will tackle about

Yamaha Matching System software

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TECHNICAL
LETTER N°8

Subject:

Squish & Compression ratio measurement

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Introduction

This Technical Letter is dedicated to squish and compression ratio measurement.

Those measures are used to determined cylinder head gasket thickness.

Through the following pages, I described a method to measure both engine features.

Summary for Squish and Compression ratio

- ❑ Introduction
- ❑ Basic Tools
- ❑ Spanner Equipment
- ❑ Squish measurement method
- ❑ Compression ratio measurement

1 . Measurement of squish hight

1.1 - Introduction

The squish height is the distance between piston and cylinder head. Through this paragraph, you will find the stages to measure and fix squish height.

The squish height must be controlled and adjusted in the following cases:

- When you change cylinder head gasket or cylinder base gasket thickness
- When you grind cylinder body height
- When you proceed engine maintenance

1.2 - Basic tools

From kit parts catalogue you can get a basic kit for the measurement of squish height. It is recommended to use this tool in addition to the basic camshaft adjustment kit which includes the crankshaft tool.

- Dial gage bridge

1.3 - Spanner equipment

In order to work effectively and precisely, you need to use appropriate tools and spanner. To drive crankshaft, we recommend you to use a long ratchet wrench with 22mm socket. A **long wrench** will help you to **drive smoothly and precisely** the engine crankshaft. By this way, you will ensure to reach perfectly piston TDC.

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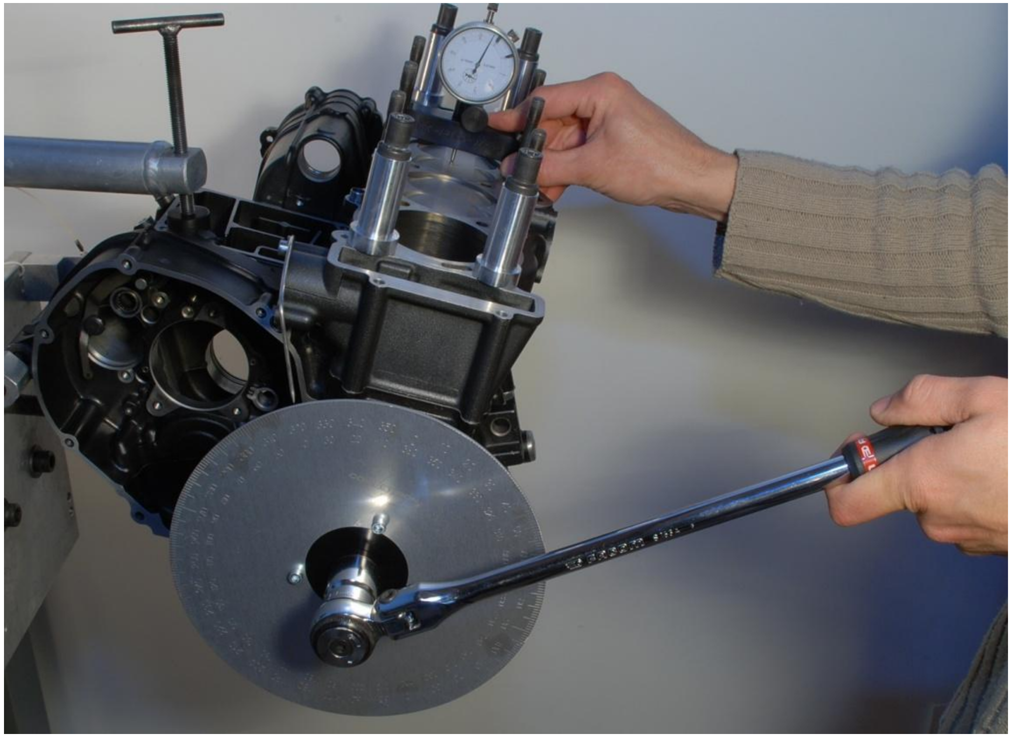
1.4 - *Practical Method*

1.4.1 – Reaching TDC

To achieve this process, it is not necessary to adjust precisely the disc. The dial gage bridge is placed on the piston centre. Then, by rotation of the crankshaft, the dial gage needle indicates the TDC when it reached the highest position.
When the piston reached the TDC position, we usually rebalanced horizontally the piston in order to provide an accurate piston depth measurement.



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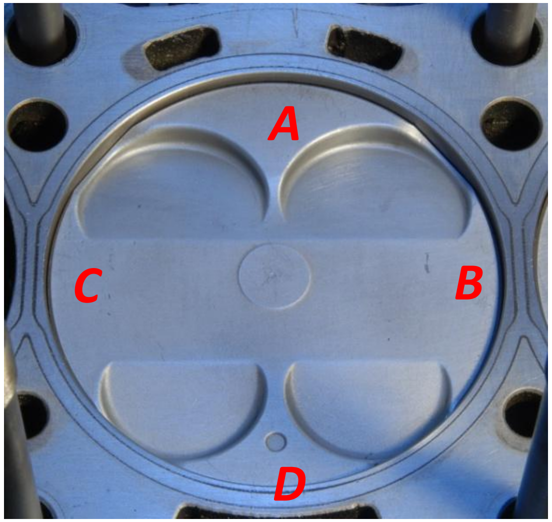
Dial gage indicate TDC when the needle reached its maximum value.

1.4.2 – Measurement of the piston depth

Once the piston reached TDC, the measurement of the piston depth may started.

To provide an accurate piston depth measurement, we usually measure 4 points outer the piston. This measurement is conduced for each piston.



The 4 points of each piston are measured as below and transfer to the table below. Before presenting the bridge on piston top, it is necessary to adjust dial gage scale to 0 mm on a marble.

Piston Number	
A	B
C	D

Once all 4 pistons and 4 points are measured, calculate piston depth average. The average of those 4 points defines the piston depth.

The value that will be used for the calculation of squish is the minimum value of average. That means the highest piston position.

	Piston Number							
	1		2		3		4	
Piston depth								
Average of 4 measurement points								

Note: piston depth may be influenced by the cylinder base gasket thickness on R1 engines.

1.4.3 Calculation of squish height

Squish height is the distance from piston to cylinder head. You may define the squish height by the following formula:

Squish height = minimum piston depth + Cylinder Head gasket thickness

Usually, we are following recommended squish height (from Kit Manual) and calculate cylinder head gasket thickness

Cylinder Head gasket thickness = Squish height - minimum piston depth

1.4.4 Recommended squish height

The minimum squish heights are mentioned in the kit manual. It is **imperative to follow those data to avoid any engine failure**.

1.4.5 Resume of squish measurement stages

- Reach piston TDC
- Measurement of 4 points of 4 pistons
- Calculation of piston depth average
- Calculation of squish height according to cylinder head gasket thickness

2 . Measurement of compression ratio

2.1 - Introduction

Compression ratio is the ratio from the volume imprisoned on the top of the piston at TDC and the complete volume when piston is at BDC.

There are several ways to measure a compression ratio. The method described in the next pages require to measure three volumes : volume of piston; volume of cylinder head gasket and volume of combustion camber.

Then, the compression ratio is calculated with those data.

2.2 – <u>Basic Tools</u>

In order to measure engine volumes, it is necessary to use accurate tools. In that way, I use a laboratory tool call burette which allow a really precise measurement.

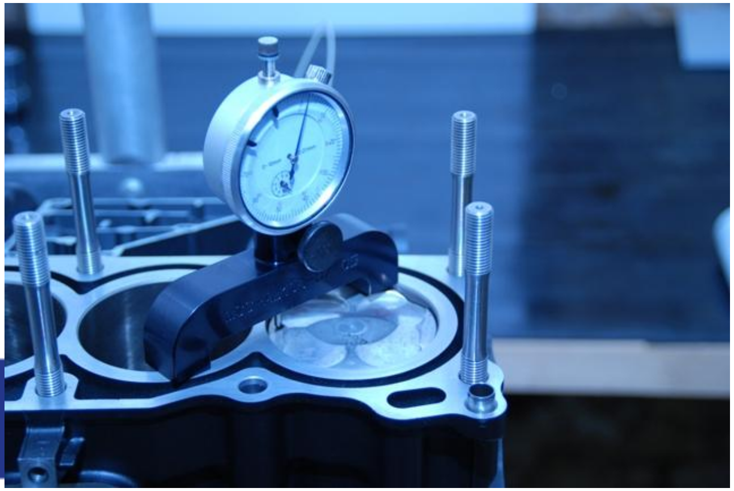
Squish measurement tool

2.3 - *Practical Method*

2.3.1 – Measurement of piston volume

The method of measurement of piston volume should be adapted to piston top shape. The simpler case is flat piston (YZF-R1 OEM parts). In that case, the piston never protrude cylinder upper face.
Racing pistons or standard R6 piston have top shape which rise upper cylinder face.

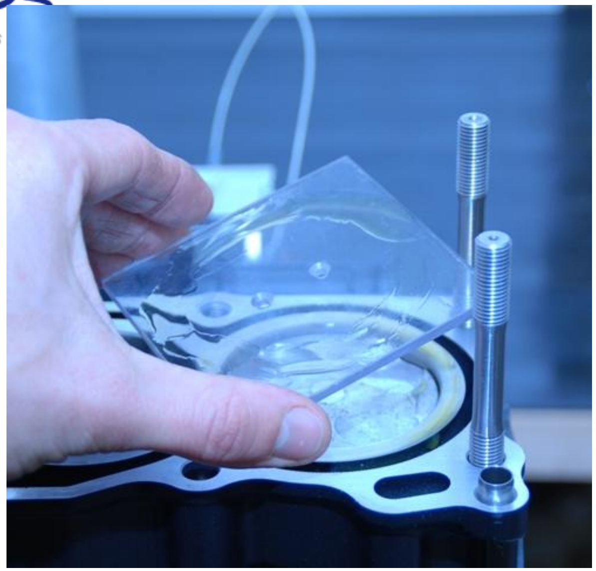
The pictures below are shot on an R6 engine (with roof piston).



The first stage consist to reach TDC following the method described during squish measurement.

Once the piston is at TDC, it is necessary to move down the piston in order to put piston top under cylinder face. With squish measurement tool, the piston **moved down of 3 mm** precisely.

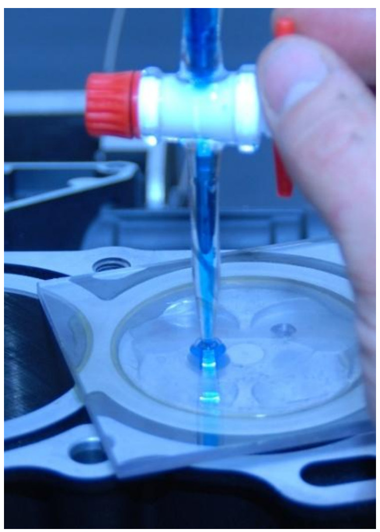
Then Plexiglas plate is “sealed” on cylinder body by grease.

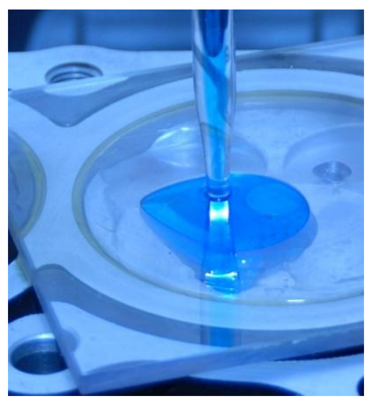


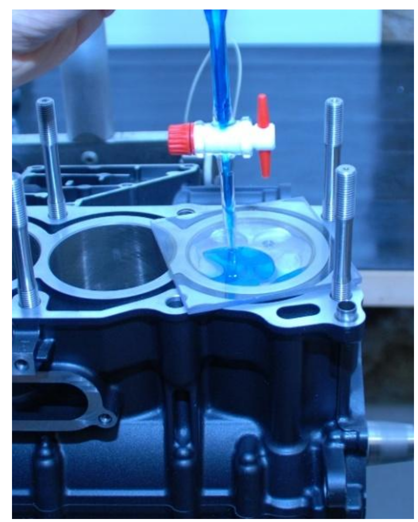
Once the Plexiglas is sealed, with a burette, fill the volume under this plate.
All the bubble will be removed by balancing engine body in order to drive out air and fill with oil.

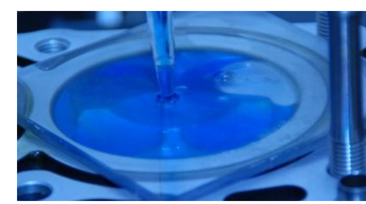
When the cylinder is filled, note the volume on the burette.

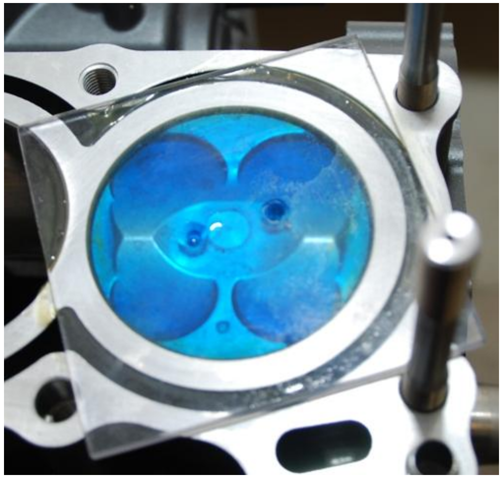
Then, it may be possible to calculate piston volume.











The piston volume is calculated with the following formula:

“Piston Volume” = “Measured volume on the burette” - “Cylinder volume generated when the piston was moving down (3mm)”

“Piston Volume (PV)” = “Measured volume on the burette” - (π * Cylinder diameter ^2 * 3 mm / 4)

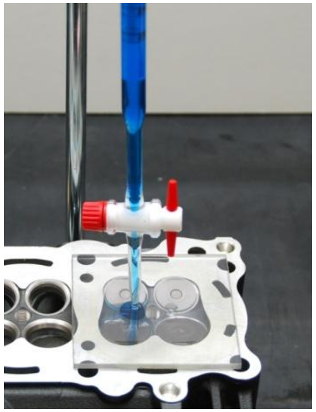
Caution: in some case, piston volume calculation may be negative, that means that piston top fill the combustion camber.

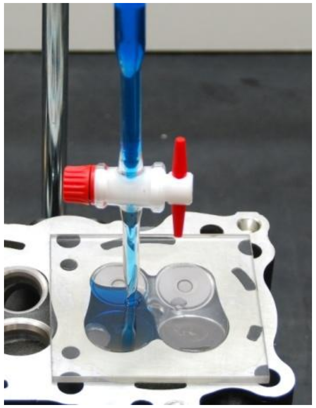
In order to remove oil from body cylinder, I suggest to use a syringe

2.3.2 – Measurement of cylinder head volume

The measurement of cylinder head volume is achieved in a similar way. Meanwhile, it may happen that valves edge rise up cylinder head surface. In that case, is it necessary to used grind Plexiglas with valve space.

Plexiglas plate is sealed on cylinder head with grease, then with burette fill combustion camber with the burette. This one was initially fill to “0” value.
When the camber is full of oil, the burette indicated the cylinder head combustion camber volume.





The burette deliver in that case the cylinder head camber volume.

"Cylinder Head camber volume (CC)" =
"Measured volume on the burette"

Note: Combustion camber volume may vary with tuning (cylinder head grinding, camber grinding, modification of valves shape or valve deph).

2.3.3 – Measurement of cylinder head gasket volume

The measurement of cylinder head gasket volume is the final and the easiest of those measures. To determine the head gasket, you need two information : gasket thickness and inner diameter (as it may vary from standard to kit gasket, it is necessary to measure this diameter.

"Gasket Volume (GV)" = (π * Inner diameter ^2 * Gasket thickness / 4)

2.3.4 – Calculation of compression ratio

"CR" = ("Unitary Cylinder volume" + "CC + PV + GV") / "CC + PV + GV"

Another way to define compression ratio:

$$\mathrm{CR} = \frac{\frac{\pi}{4} b^2 s + V_c}{V_c}$$

b: cylinder bore
s: piston stroke
Vc : Volume of combustion camber (including gasket volume)

Next month,

Technical letter n°9 will tackle about

Piston installation and conrod fitting.

Motorcycle Kit Parts Support

TECHNICAL LETTER N°7

Subject:

Camshaft

Practical

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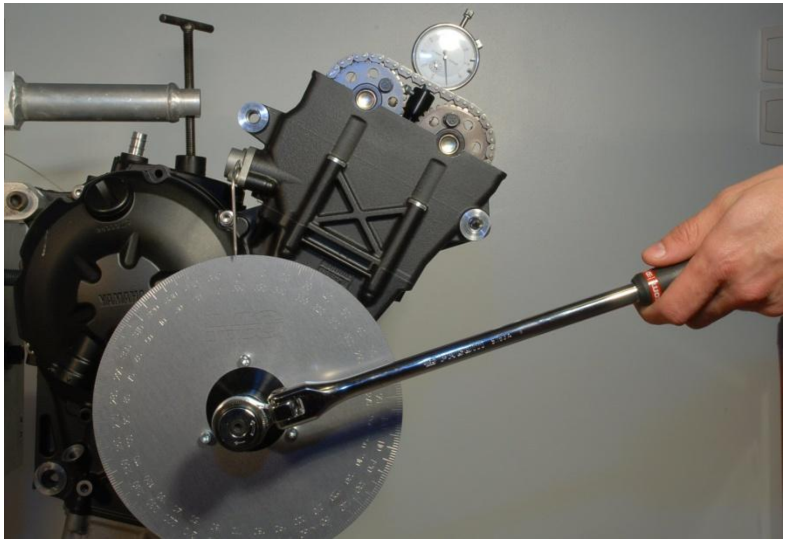
Introduction

This Technical Letter is the second edition concerning camshaft.
Through the following pages, I described one method to reach camshaft recommended event angle.

The previous Technical Letter described the vocabulary and the recommended camshaft settings, this new edition is the practical application.



Summary for Camshaft setting

- Introduction
- Basic Tools
- Spanner Equipment
- Camshaft Setting Practical Method

Camshaft Setting

1.1 - Introduction

You may meet different case when it is necessary to adjust camshaft timing.
Basically, you must control and or adjust camshafts timing in the following cases:

- When you replace standard camshaft by YEC Supersport or Superbike cams
- When you are tuning an engine in Stock condition
- When you change cylinder head gasket or cylinder base gasket thickness
- When you grind the cylinder head or cylinder body
- When you fit Superbike pistons

1.2 - Basic tools

We propose in our kit parts catalogue a “Basic kit of Adjustment tool”. This kit includes:

- Two gages to measure valve position
- One lever to lift up the valve
- One angle disc with axle to fit every engines
- One TDC detecting tools

Beside this basic kit, you must obtain the “Attachment tool” for your engine. An “Attachment Tool” is available for each engine.

Note : The “Attachement tool” set are delivered without dial gages.

1.3 - Spanner equipment

In order to work effectively and precisely, you need to use appropriate tools and spanner. To drive the disc, we recommend you to use a long ratchet wrench with 22mm socket. A **long wrench** will help you to **drive smoothly and precisely** the engine crankshaft. By this way, you will ensure to reach perfectly piston TDC.

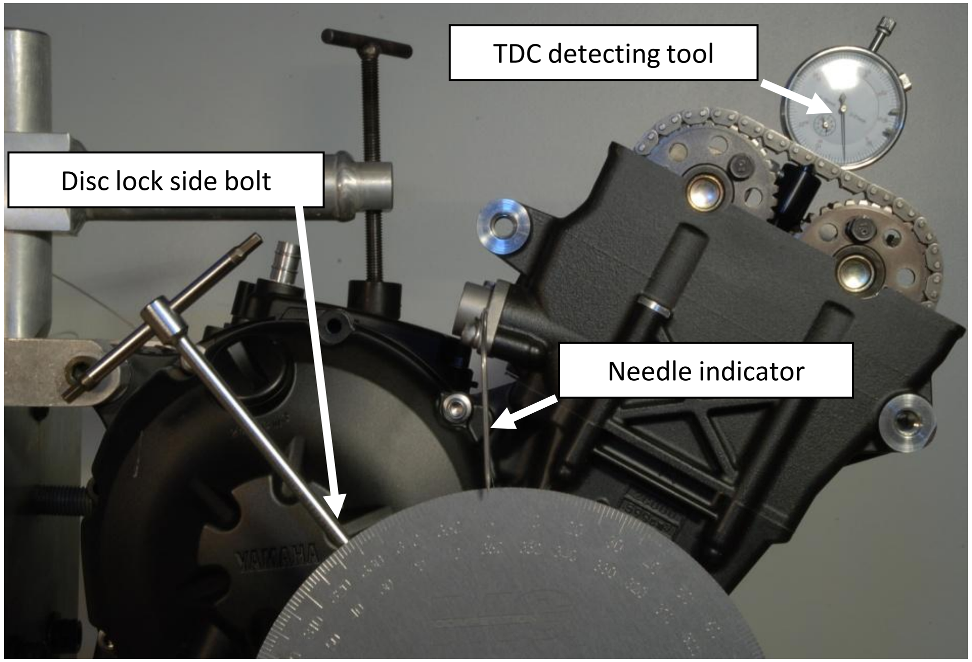
1.4 - *Practical Method*

1.4.1 - Locating angle disc to TDC

The first stage of camshaft setting consists to locate crankshaft position. Crankshaft position is displayed by an angle disc. To fit the disc to the engine, unscrew the bolt situated on the right side of the engine crankshaft. Then, with a 22mm socket on a ratchet, you can drive the engine crankshaft.

Then, fit a needle to indicate the crankshaft position.

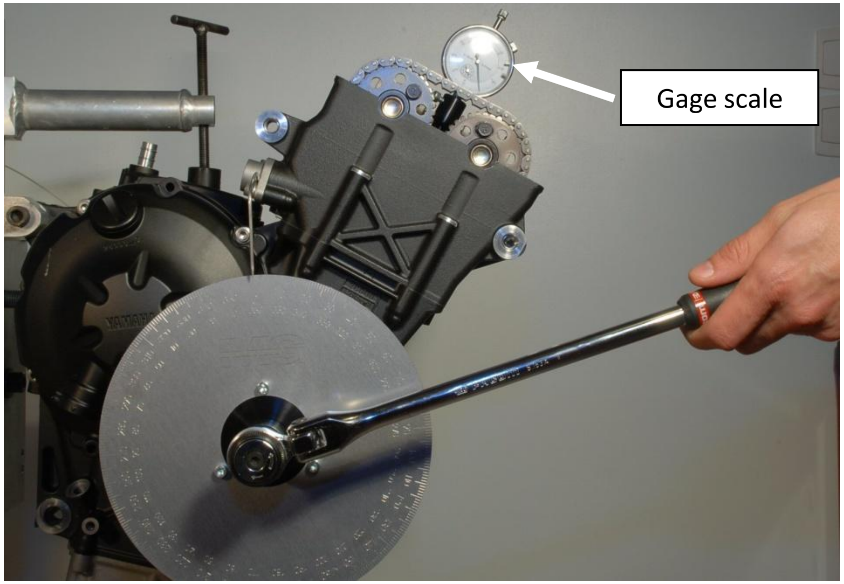
Finally, screw the TDC detecting tool in the spark plug hole.



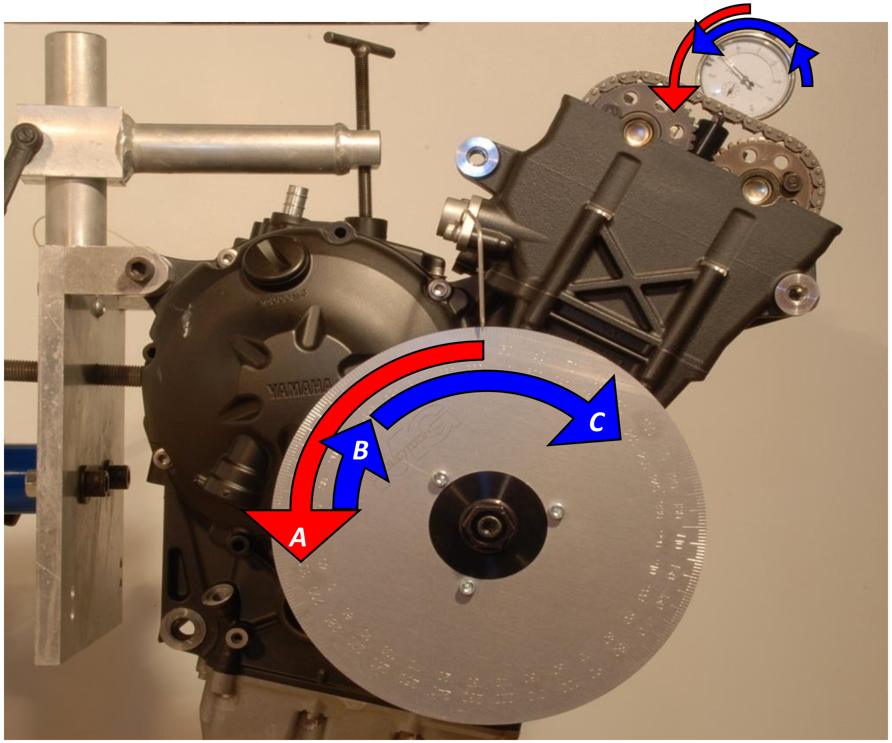
Once the tools are installed on the engine, you can start to locate TDC:

- Reach quickly the TDC (TDC dial gage detecting piston position. When dial gage indicate top position, turn the scaling in order to set 0 mm on the gage)

- Unscrew the lock side bolt of the disc and put the “0° ” angle in front of the needle



Once you set up roughly the disc position, you must control and re-adjust precisely the "0° " of the disc. Then, you will turn the crankshaft in order to move down the piston 2 mm on each side of the TDC (Before and After Top Dead Center). Meanwhile, each time, be aware the **crankshaft should be driven clockwise (usual crankshaft direction)** to clear out all back clearance from a counter-clockwise rotation**.** This remark is particularly important more specially during camshaft setting. In this case, we suggest driving backward (counter-clockwise) so that the piston goes down a minimum of 3mm (***Direction A on the picture next page)***. Then, you may run again the crankshaft clockwise to clear out back clearance ***(direction B and C on the picture next page)***.



			Piston position		
			2mm BTDC ***B position***	TDC	2mm ATDC ***C position***
Angle in Degree on the disc	Stage 1	Set disc position roughly		**" 0° "**	
	Stage 2	Measurement at 2mm before and after Top Dead Center	22°		24°
	Stage 3	1st adjustement of the disc	22,5°		23,5°
	Stage 4	2nd adjustment of the disc	23°	**0°**	23°

The angle indicated above are an example. You may measure different values

Symmetrical degree on each side of the disc =>
the disc correctly indicate TDC at " 0° "

You must go through this steps has there is a wide angle (about 2 to 3 degrees) when the piston does not move. You will repeat the stages in order to get the same angle on the disc when the piston is 2mm symmetrically before and after the Top Dead Center.

On the sample, in stage 4, the disc is in a correct position. **This is the starting point for the measurement of the camshaft event angle**.

1.4.2 Setting the exhaust camshaft

As the exhaust camshaft is the first one driven by the chain, **we recommend starting camshaft setting on exhaust side**. To measure cam position, fit the "*Adjustement Tool*" on the left side of the cylinder head.
Be aware of the gage should measure a complete valve stroke (Drive 360° the camshaft to control the gage stroke). You may adjust the gage altitude with the clamp screw. Once you have been through this point, you may start camshaft position measurement.

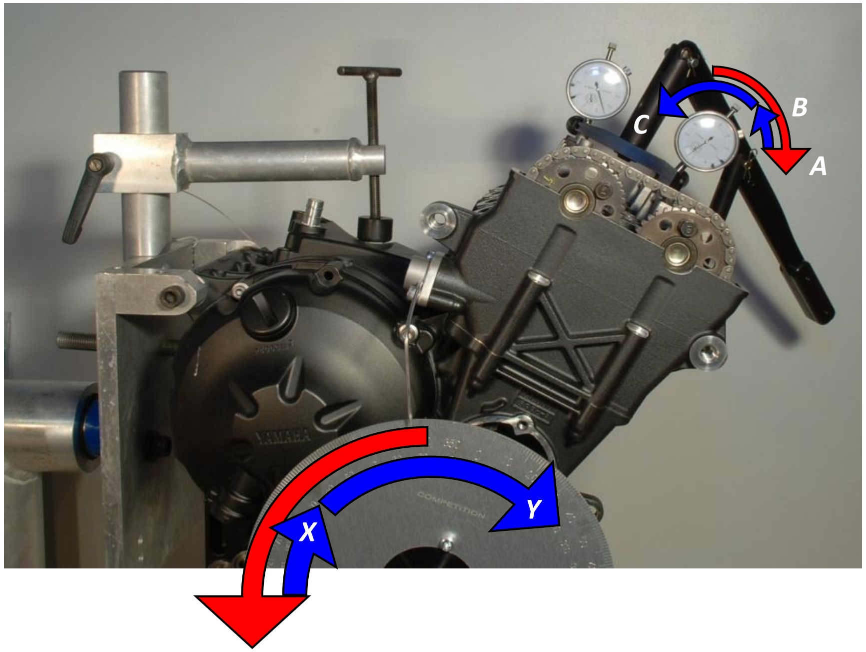
- ***Measurement of event angle***

By definition, event angle means the crankshaft position at maximum valve lift.

First of all, you have to reach quickly the maximum valve lift. Then, adjust the valve gage scaling to "0 mm" position. In a similar way as the method we used to reach the piston TDC, we are going to measure crankshaft angle on each side of the maximum valve lift. Moreover, to clear out clearance between chain and cam sprocket, **it is imperative to drive the crankshaft clockwise**.

Symmetrically around the maximum valve lift, we are reading the crankshaft position on the disc. With these two values, we are calculating the exhaust camshaft event angle.

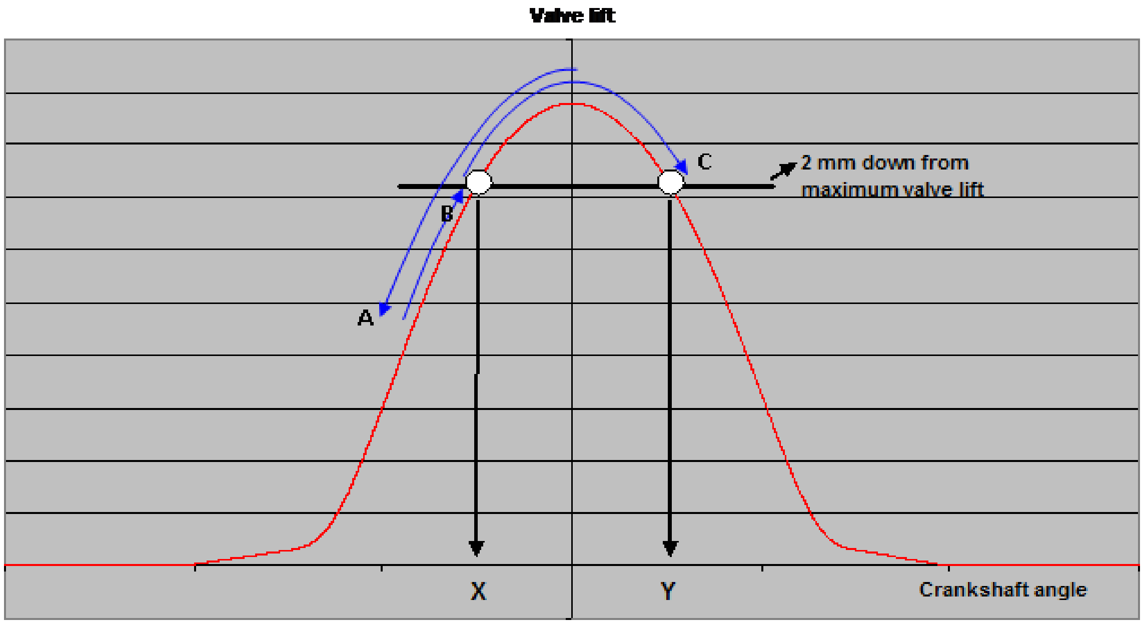
To get disc angle, follow the steps below:



a) turning the crankshaft counter-clockwise with minimum **3mm down on the valve** (***A***)
b) turning the crankshaft clockwise in order to clear out the clearance from chain and camshaft sprocket and reach the position of the valve **2 mm down before maximum lift** (the value on the disc is "***X***" from outside angle scale on the disc) (***B***)
c) then drive again the crankshaft clockwise to reach **2mm down after maximum lift** and note the crankshaft angle (value on the disc is "***Y***" from outside angle scale on the disc) (***C***)
d) Then calculate camshaft event angle:

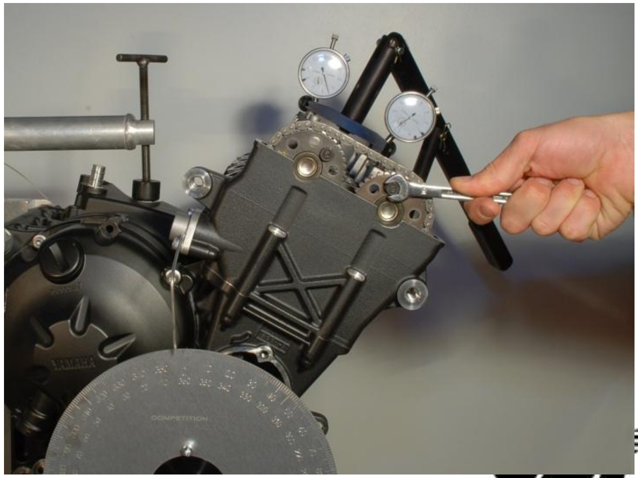
Exhaust event angle = (X+Y) / 2 (From outside disc angle scale)

The graph below describe the valve opening curve.



Once you have measure the position of the camshaft, you may need to change it. In any case, you have to follow **recommended data from the Kit Manual.**

To change the position of the camshaft, unscrew the sprocket bolts and drive the crankshaft to make the sprocket turning a tiny angle around the camshaft. Then, tight the bolts and measure again the position of the camshaft.



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You must repeat this operation till you reach the recommended camshaft position. This is a method by iteration.

			Valve position		
			2mm down Before maximum lift	Maximum lift	2mm down After maximum lift
Angle in Degree on the disc	Stage 1	Measurement of the original camshaft position		**115°**	
	Stage 2	Second measurement after modifying camshaft position		**108°**	
	Stage 3	Third measurement after modifying camshaft position	169°	**111°**	53°
	Stage 4	Fourth measurement after modifying camshaft position	168°	**110°**	54°

The angle indicated above are an example. You may measure different values

Following several camshaft positions the recommended target is reached

- ***Measurement of valve to piston clearance***

Once the camshaft has reached the event angle target, you must control the clearance from the valve to piston. On exhaust side, the minimum distance from valve to piston is situated at 10 degrees before TDC.

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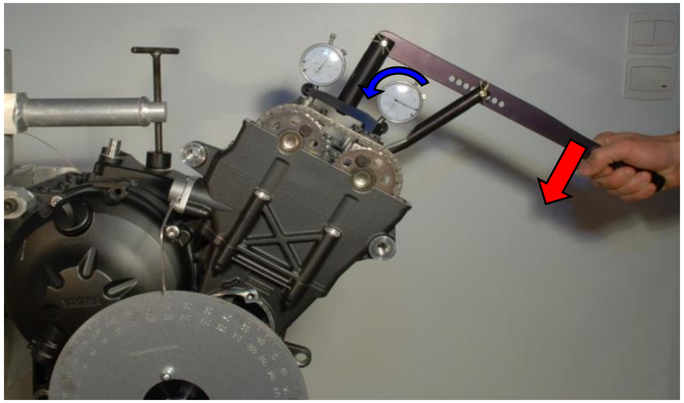
To measure this clearance, the Kit Adjustment tool includes a lever. This lever as you may see on the following picture is pushing the tappet valve. The distance from valve to piston is displayed on the gage.



Stage of the valve to piston measurement:

- Place the crankshaft 10° BTDC
- Turn the gage scaling so that the needle display “0mm”
- Apply a force on the lever in order to lift the valve till the valve hit the piston
- Read the position of the needle on the gage

The minimum distance between valve and piston is mentioned on the Kit manual. To avoid any engine failure, you can not go lower than the recommended values. Moreover, in case of a distance between valve and piston measured under the minimum value (due to the use of special parts), it is recommended to move out the camshaft in order to secure the valve to piston distance.

Valve to piston distance has the priority on the event angle.

Once the exhaust camshaft event angle has reached Kit Manual recommended value and valve to piston clearance over the minimum secure distance, you can start to set up intake camshaft.

1.4.3 - Setting intake camshaft

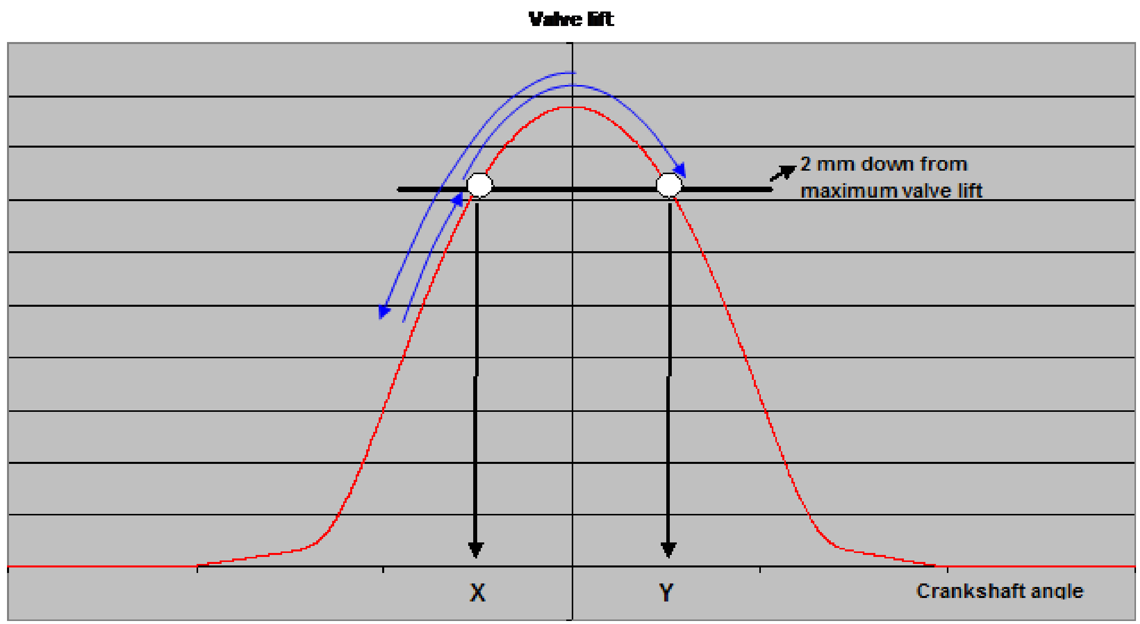
The method that consists to set up intake camshaft is similar to exhaust setting.

- **Measurement of event angle**

  - Reach maximum lift of intake valve by driving crankshaft
  - Adjust intake gage scaling in "0 mm" position
  - Lift down intake valve about 3mm by turning crankshaft counter-clockwise
  - Lift up the valve to reach 2mm before maximum lift by turning the crankshaft clockwise (position of the disc = ***X*** from inside angle on the disc)
  - Symmetrically after maximum lift, lift down the intake valve to 2mm by turning the crankshaft clockwise (position of the disc =***Y*** from inside angle on the disc)
  - Calculate camshaft event angle by using the following formula:

Intake event angle = (X+Y)/2 *(From inside disc angle scale)*

The graph below describe the movement of the intake valve through crankshaft position



In case of re-adjustment of camshaft event angle, you may proceed in a similar way as the method presented on paragraph concerning the exhaust camshaft.

➢ Measurement of the valve to piston clearance

The final intake camshaft setting require to control the distance from valve to piston. This parameter got the priority to the event angle.

The minimum distance from valve to piston is mentioned on the kit manual. This value may change according to the engine specification.

The method of the measurement is similar to the exhaust case. Meanwhile, the minimum distance from intake valve to pistons occur at 10 degrees After TDC.

Stage of the valve to piston measurement:

- Place the crankshaft 10° ATDC
- Turn the gage scaling so that the needle display “0mm”
- Apply a force on the lever in order to lift the intake valve till the valve hit the piston
- Read the position of the needle on the gage

1.4.4 - Recommended camshaft setting

The recommended camshafts setting (event angle and clearance from valve to piston) are mentioned in the Kit manual.

The parameter can change year by year and model by model. Then it is necessary to refer your engine model to the matching kit manual.

1.4.5 - Resume of camshaft setting stages

- Fitting the angle disc so that 0° of the scale indicate piston Top Dead Centre
  - Reach roughly TDC and set 0mm on the TDC dial gage
  - Check disc angle symmetrically when piston is 2mm down Before and After TDC
  - Re-adjust disc position if necessary

- Setting exhaust camshaft
  - Reach maximum exhaust valve lift and set 0 mm on the dial gage
  - Measure crankshaft angle position when valve is symmetrically 2mm down from maximum lift
  - Calculate camshaft event angle
  - Adjust camshaft event angle if necessary
  - Measure valve to piston clearance
  - Re-adjust camshaft event angle if necessary

- Setting intake camshaft
  - Reach maximum intake valve lift and set 0 mm on the dial gage
  - Measure crankshaft angle position when valve is symmetrically 2mm down from maximum lift
  - Calculate camshaft event angle
  - Adjust camshaft event angle if necessary
  - Measure valve to piston clearance
  - Re-adjust camshaft event angle if necessary

Next month,

Technical letter n°8 will tackle about

Squish measurement & compression ratio.

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TECHNICAL LETTER N°6

Subject:

Camshaft

Theory

yamaha-racing parts.com

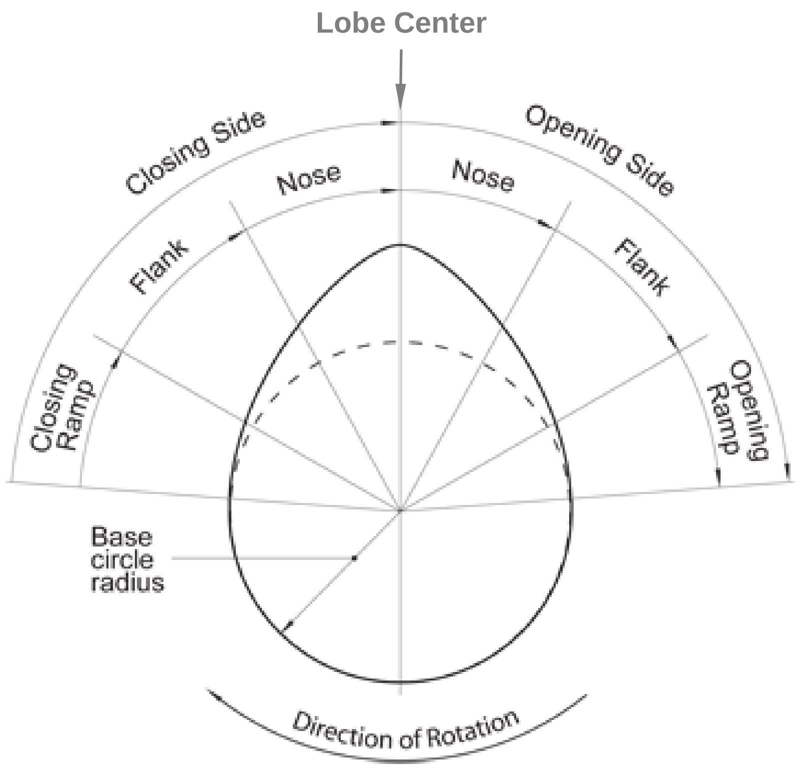
Introduction

This new edition of Technical Letter presents the first approach of camshaft.
This document, is a reminder of camshaft vocabulary and basic knowledge in order to prepare practical camshaft setting which will be presented on the next Technical Letter.

Summary

- Vocabulary and Camshaft Theory
- Camshaft setting
- Kit camshaft specification
- Camshaft reference table

Vocabulary and Camshaft Theory



CAMSHAFT DEFINITIONS

When discussing camshafts, enthusiasts often get confused with the terminology used to describe the various parts of the camshaft. We hope the diagram on the left and the definitions below will help enthusiasts better understand camshafts and the related terminology.

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- **RAMP:** The textbook definition of ramp is the section of the cam from the base circle to where the valve physically begins to open, or finishes closing. It is also commonly referred to as a clearance ramp; or in other words the part of the cam lobe where the camshaft will close up the initial tappet clearance (lash) and the tappet/follower will make initial contact (on the opening side) or end its contact with the camshaft (on the closing side)

- **FLANK:** is defined as the end of the ramp section to the point where the valve reaches maximum velocity.

- **NOSE:** is defined as the section between the maximum velocity on the opening side and maximum velocity on the closed side, or rather the section of the cam where the valve spring forces are keeping the valve train from separating from the cam surface.

- **LOBE CENTER:** is described as the maximum valve lift or nose center.

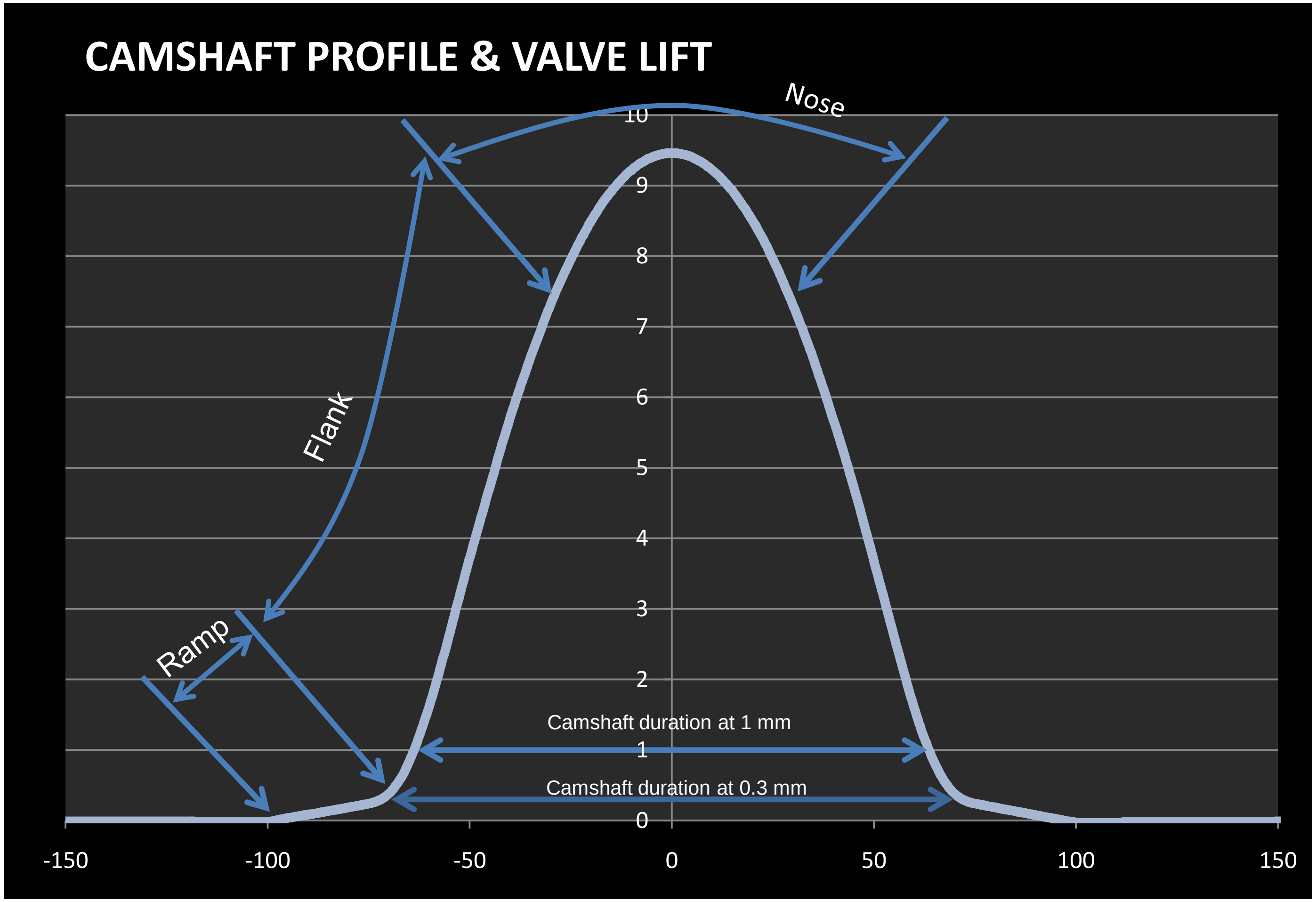
- **TDC: T**op **D**ead **C**enter : This term is used when the piston is located on higher position (Top)

- **BDC: B**ottom **D**ead **C**enter : This term is used to define piston in Bottom position

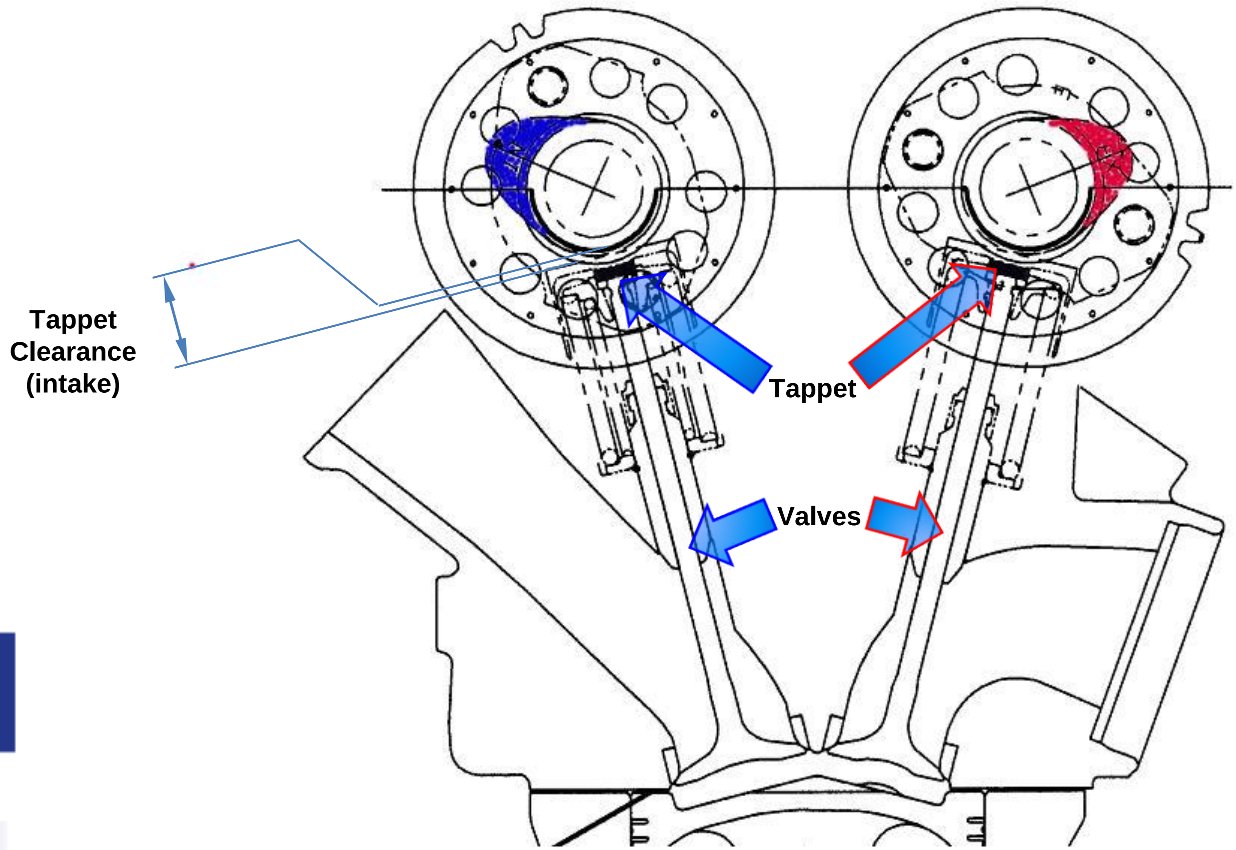
- **ATDC: A**fter **T**op **D**ead **C**enter => define piston position After TDC

- **BTDC: B**efore **T**op **D**ead **C**enter => define piston position Before TDC

• **Valve lift and duration:** the lift is defined as the linear movement of the valve. The maximum lift is reached at lobe center. Valve opening duration is a parameter which is used to defined the duration (in angle) of opening valve. This parameter is given at 0.3mm of valve lift sometimes at 1mm. On kit manual book, this parameter is given at 0.3mm.



Adjusting tappet clearance



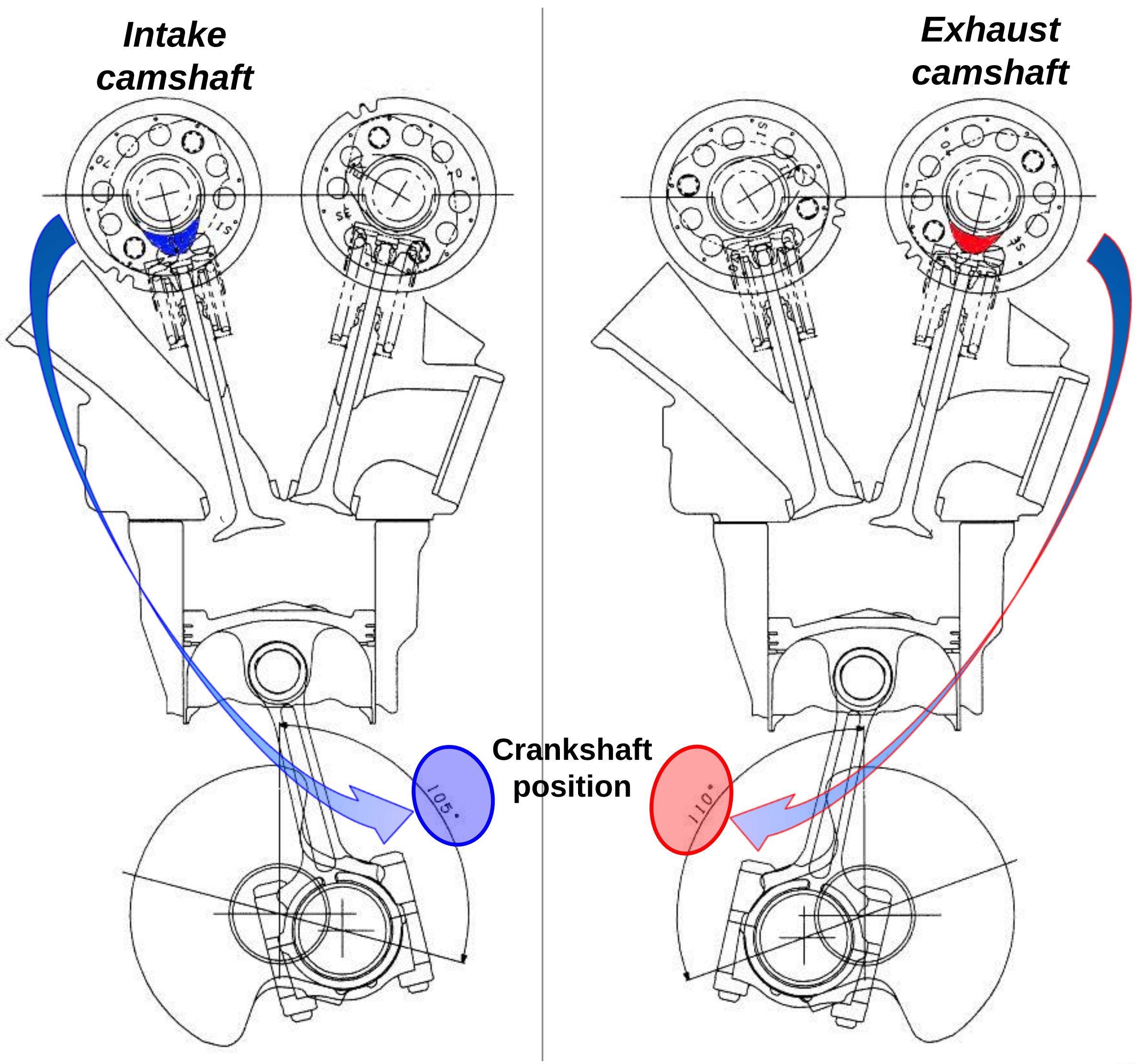
• **TAPPET Clearance:** The tappet clearance is the distance from the camshaft base circle to the lifter valve. This clearance is maximum when the cam lobe is in opposit position to valve steam. This clearance is closed up when the camshaft ramp come in contact with lifter valve.

This clearance is defined on Kit Manual Book and established to compensate valve steam elongation with engine heat.

	Valve (tappet) Clearance
Intake	0,17 to 0,23 mm
Exhaust	0,27 to 0,33 mm

Camshaft setting

First stage : Adjusting camshaft event angle



• **Event angle:** is defined as the crankshaft angle position when camshaft intake or exhaust is located at maximum valve lift.

The Event angle of both camshaft intake and exhaust should follow the recommended values in kit manual book.

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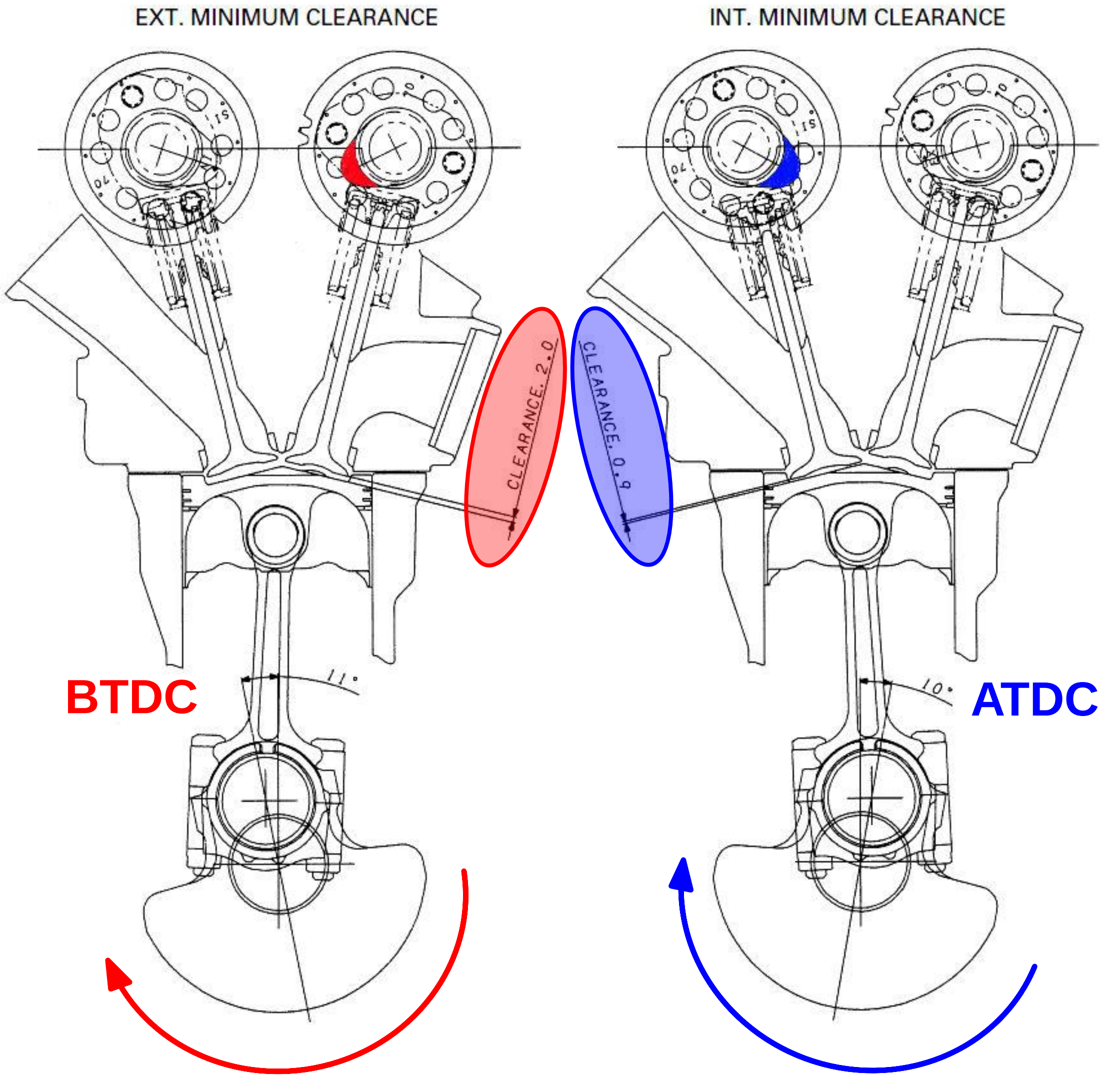
Second stage : Checking Valve to Piston clearance



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- **Valve To piston clearance:** camshaft event angle define the position of camshaft regarding crankshaft angle. Meanwhile, due to engine tuning specifications, camshaft position measurement should be combine to the clearance from valve to piston.

This clearance got **priority** to camshaft position. This clearance is mentioned on kit manual book.

Clearance from valve to piston on exhaust side is controlled Before TDC.
Clearance from valve to piston on intake side is controlled After TDC.

The angle of control at BTDC and ATDC is mentioned in kit manual book with camshaft recommended event angle.

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Camshaft recommended setting

Year / Model	R1 Intake (Event angle / clearance)	R1 Exhaust (Event angle / clearance)
2010	110° (1mm / 10°)	105° (2mm va/pis)
2009	110° (1mm / 10°)	110° (2mm /10°)
2008	110° (1,28mm / 10°)	110° (2,58mm / 10°)
2007	110° (1,28mm / 10°)	110° (2,58mm / 10°)
2006	105° (1,3mm / 10°)	105° (2,5mm / 10°)
2005	105° (1,3mm / 10°)	105° (2,5mm / 10°)
2004	105° (1,3mm / 10°)	105° (2,5mm / 10°)

Event angle

Clearance

Angle of control

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Year / Model	R6 Intake (Event angle / clearance)	R6 Exhaust (Event angle / clearance)
2010	110° (1,05mm / 12°)	115° (1,62mm / 12°)
2009	110° (1,1mm / 12°)	110° (1,62mm à 12°)
2008	110° (1,1mm / 12°)	110° (1,62mm à 12°)
2007	110° (1,1mm / 12°)	110° (1,62mm à 12°)
2006	105° (1,1mm / 12°)	109° (1,62mm à 12°)
2005	105° (0,75mm / 10°)	105° (1,75mm à 11°)

R6 Camshafts Reference Table

	R6	
Year / Model	Intake	Exhaust
2010	2C0-12171-71	2C0-12181-71
2009	2C0-12171-71	2C0-12181-71
2008	2C0-12171-71	2C0-12181-71
2007	2C0-12171-71	2C0-12181-71
2006	2C0-12171-70	2C0-12181-70
2005	5SL-12171-80	5SL-12181-80

R1 Camshafts Reference Table

Year / Model	R1 Intake	R1 Exhaust
2010	14B-12170-70	14B-12180-70
2009	14B-12170-70	14B-12180-70
2008	4C8-12171-80	4C8-12181-80
2007	4C8-12171-70	4C8-12181-70
2006	5VY-12171-71	5VY-12181-71
2005	5VY-12171-71	5VY-12181-71
2005 (Standard lift)	*5VY-12171-81*	*5VY-12181-81*

Next month,

Technical letter n°**7** will tackle about

camshafts practice

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TECHNICAL LETTER N°5

Subject:

Racing Kit Wire Harness

For YZF – R1

YEC
yamaha-racingparts.com

Introduction

Following the presentation *(TL n°4)* of YAMAHA YZF-R6 wire harness, *TL n°5* presents YEC racing kit wire harness for YAMAHA YZF – R1.

Several pictures will help users to understand functions, to recognise sensors and associated couplers.

Summary

- General other view of *Racing Kit Wire Harness*
- Detail of each couplers and sensors
- Wire Harness reference table

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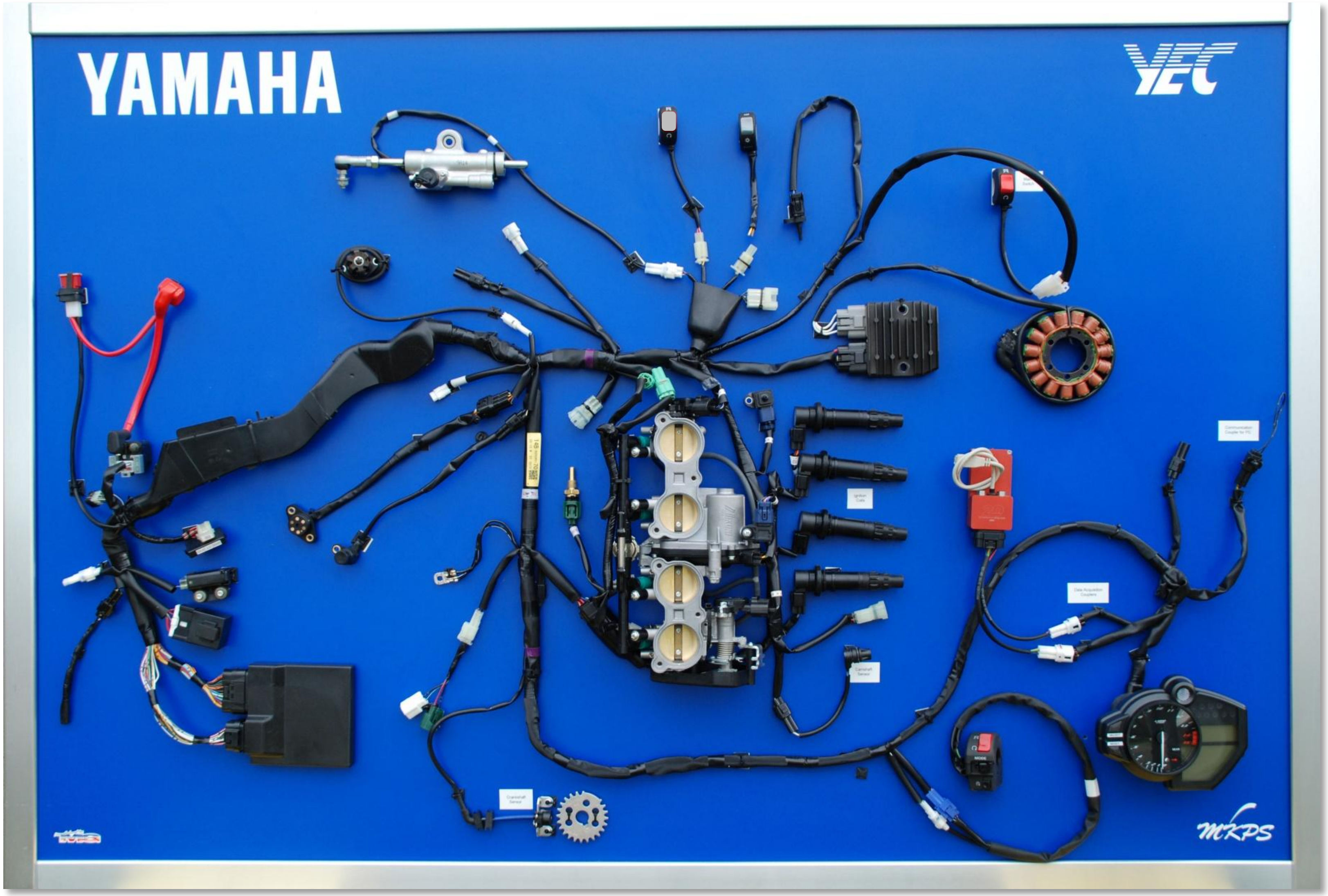
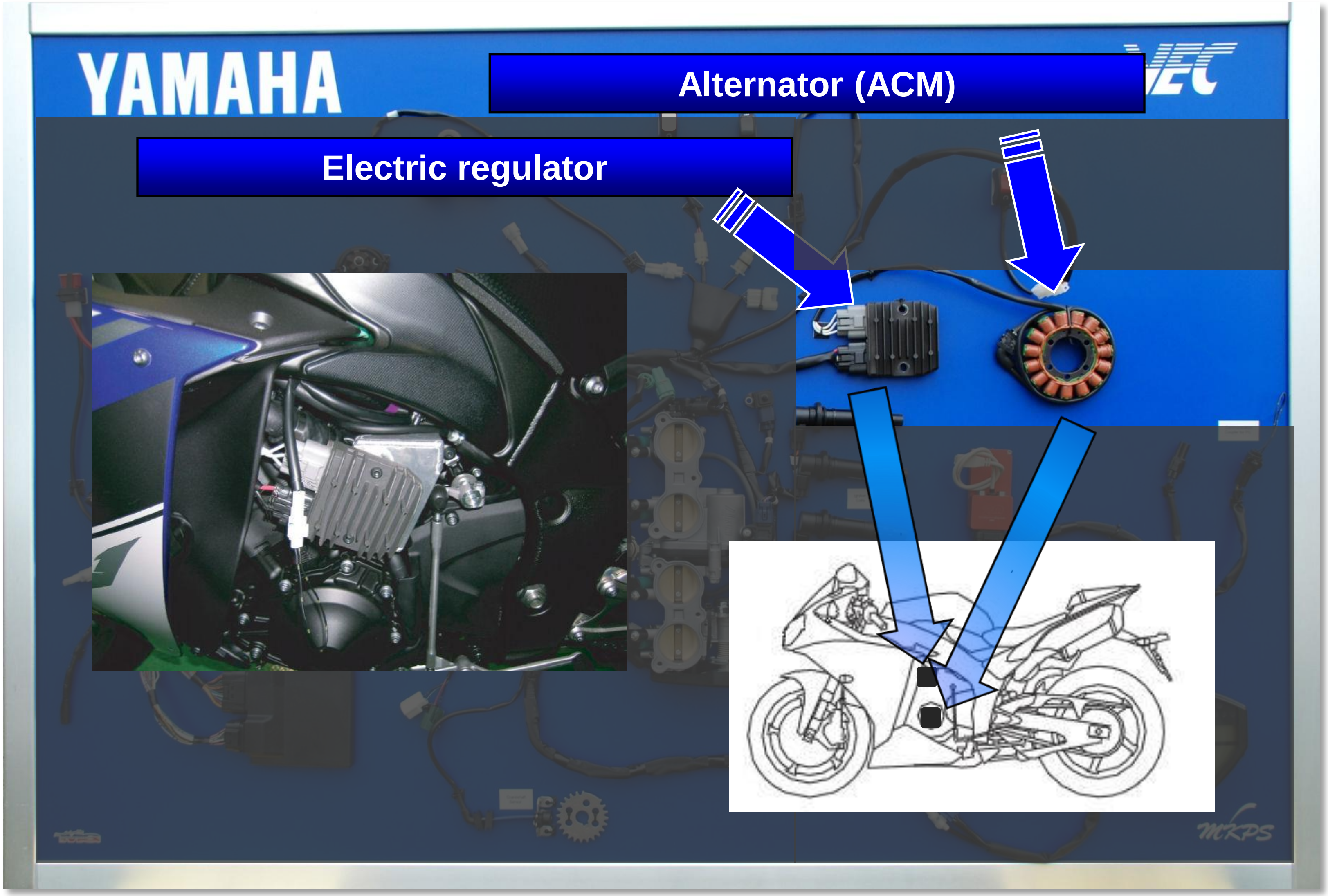
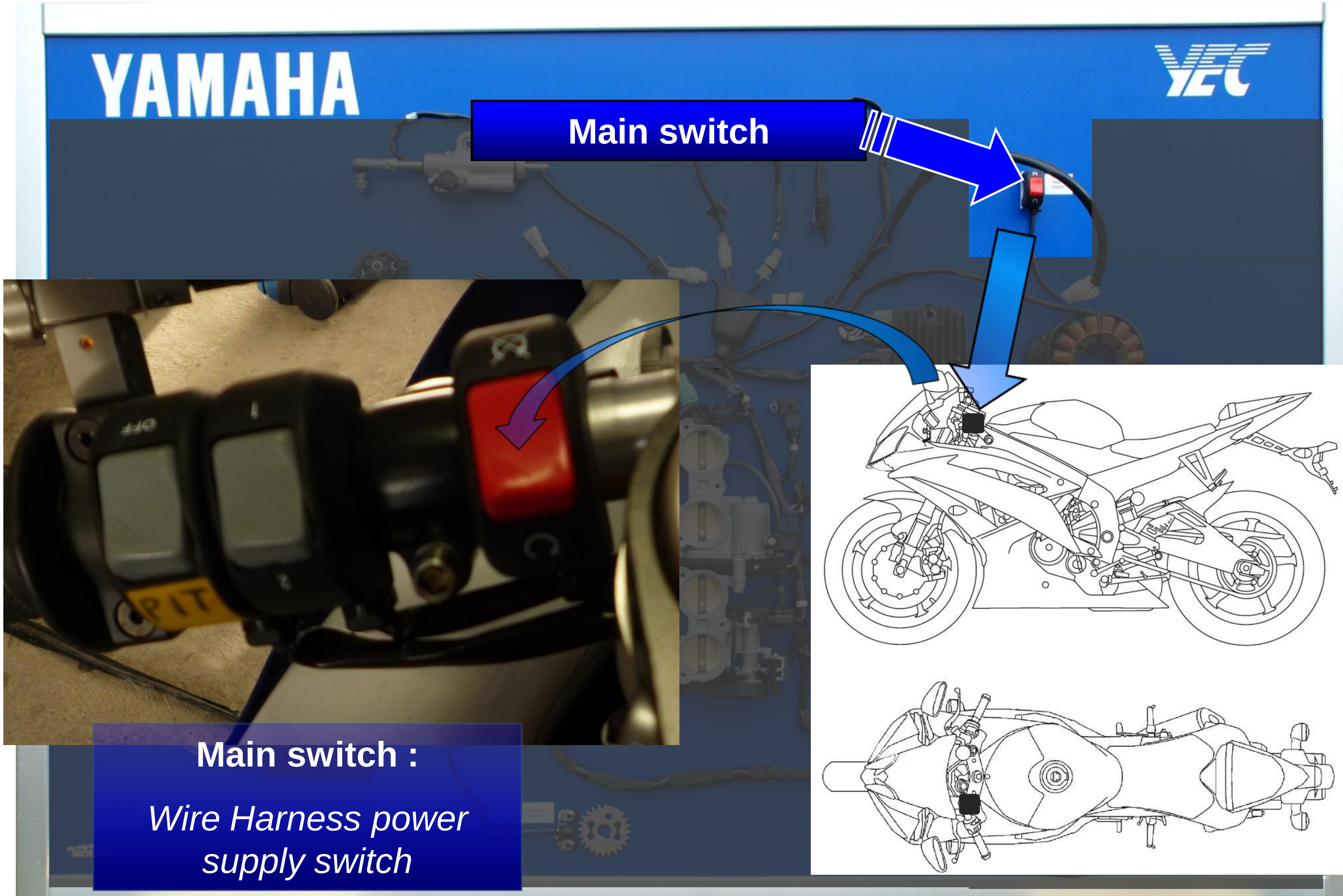
General over view of YZF – R1 Racing Wire Harness



YEC
yamaha-racingparts.com

Detail of each parts of Wire Harness



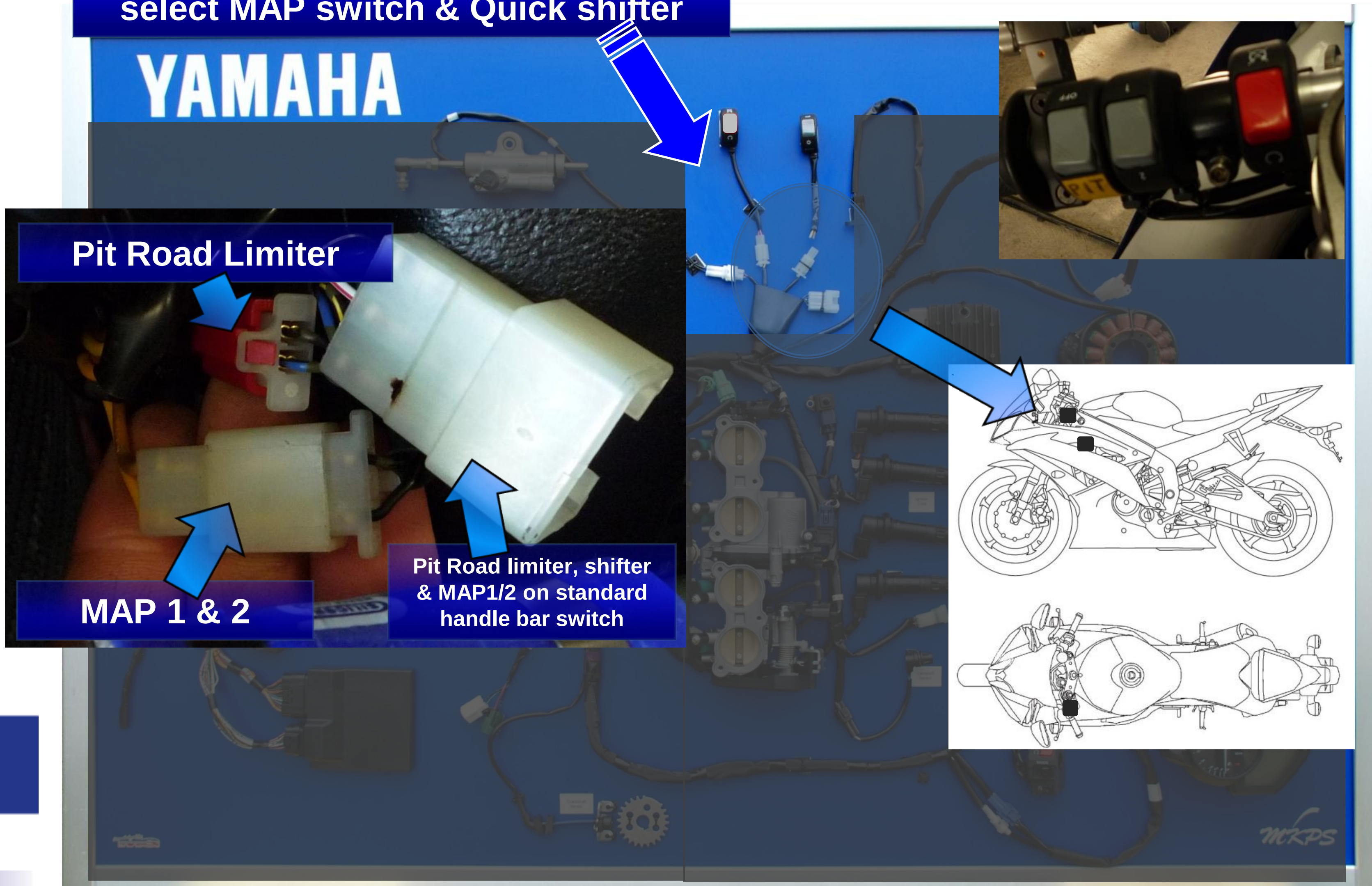


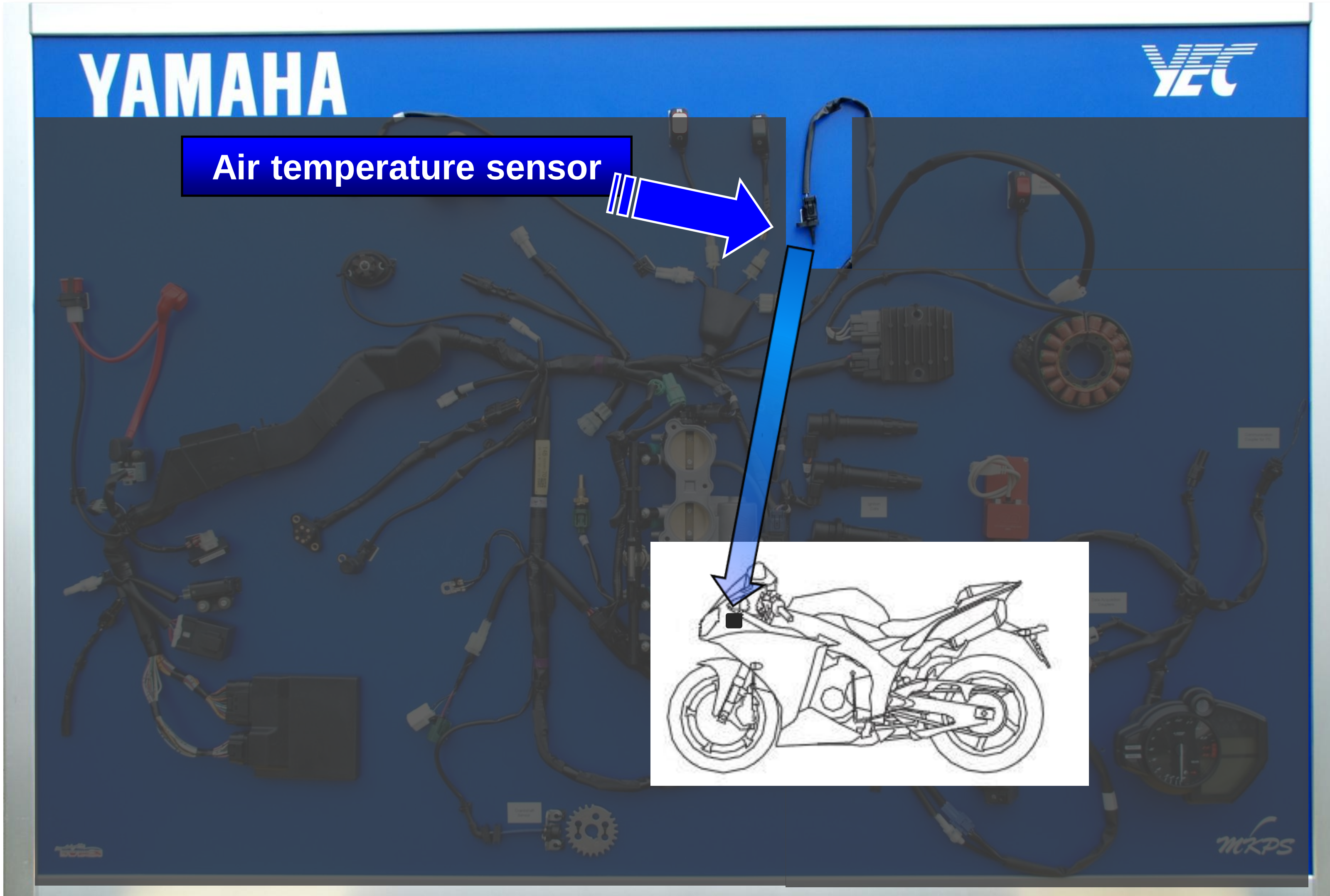
Main switch

Main switch :

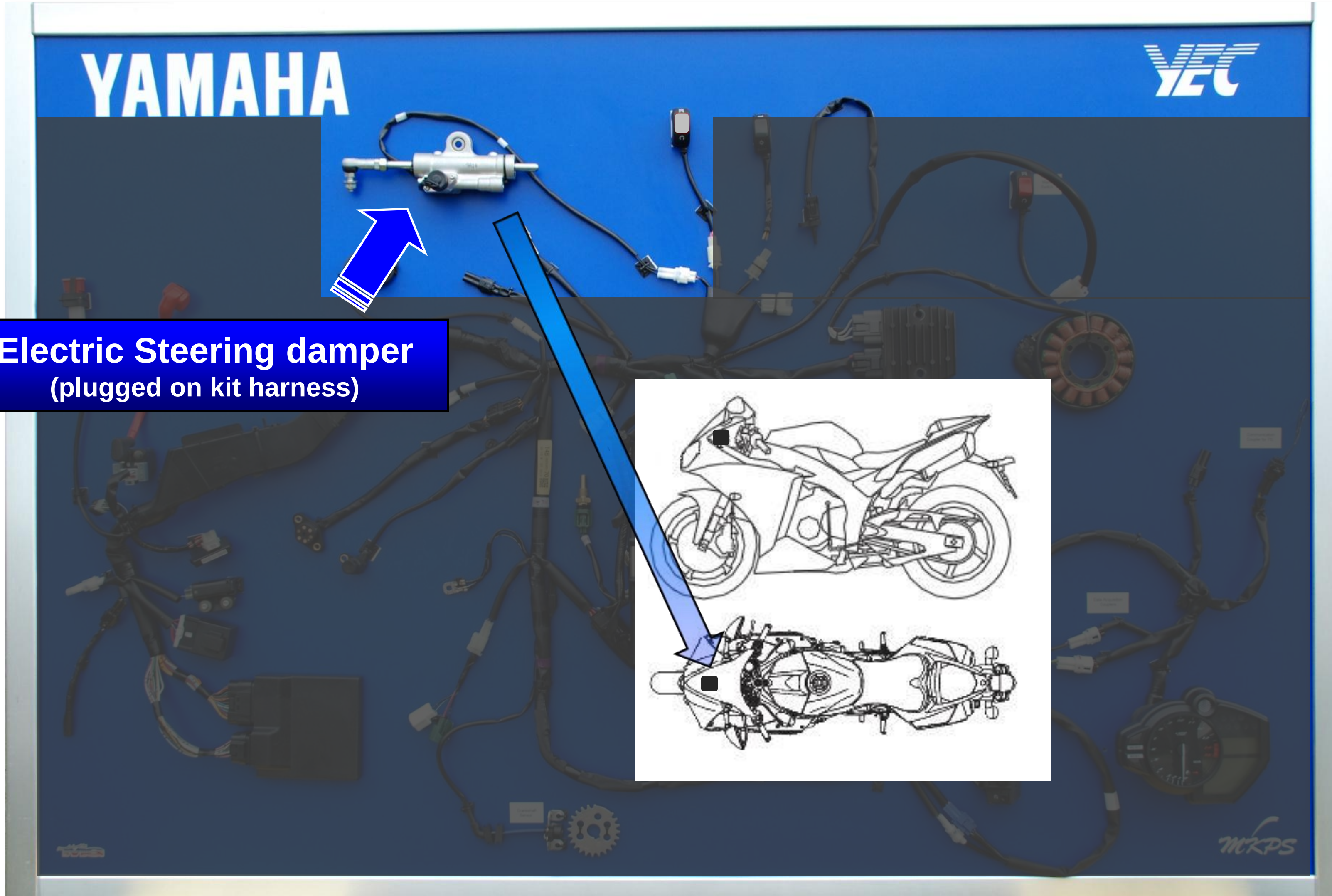
Wire Harness power supply switch

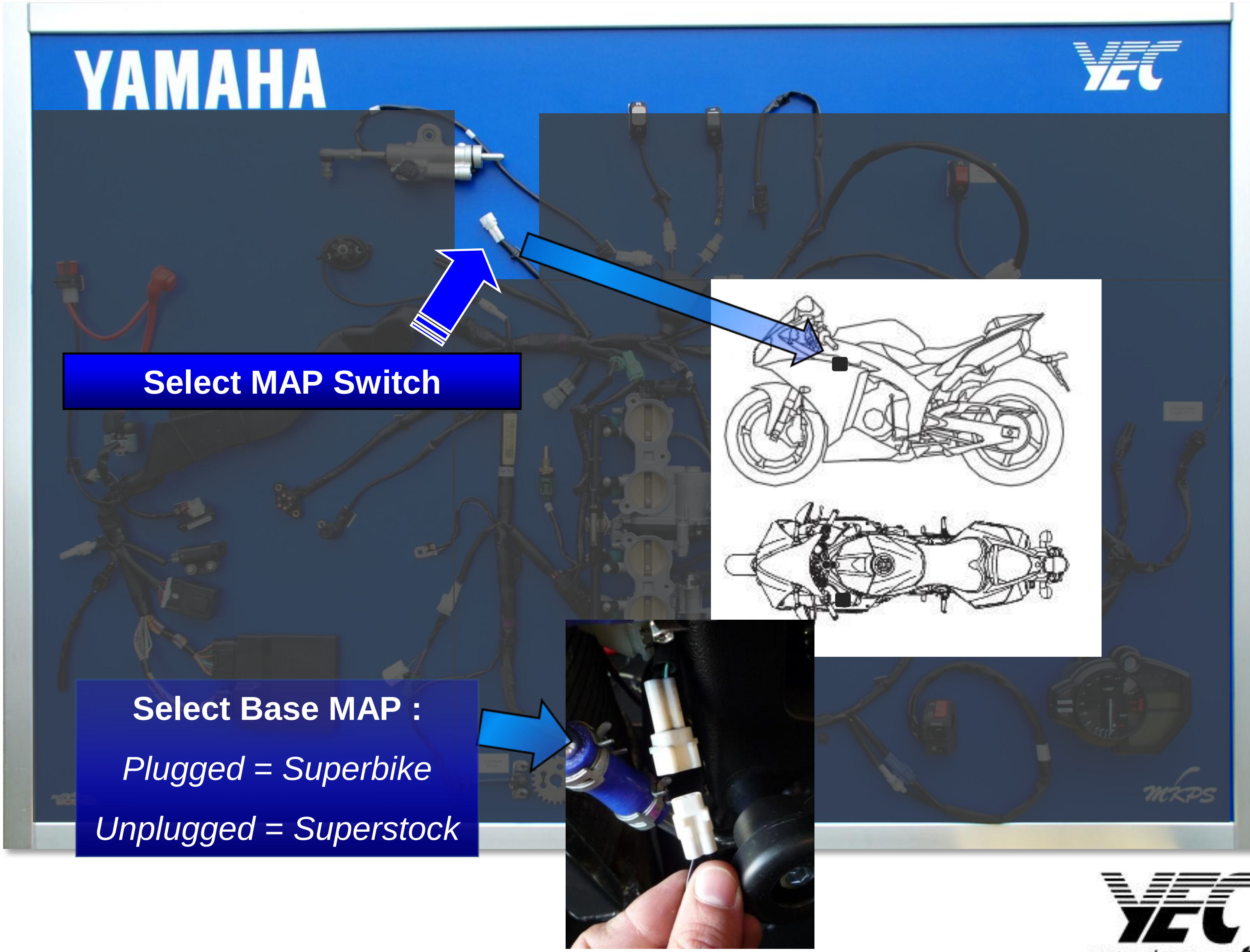
Pit Road Limiter, select Base MAP, select MAP switch & Quick shifter




YAMAHA
Air temperature sensor

Electric Steering damper
(plugged on kit harness)



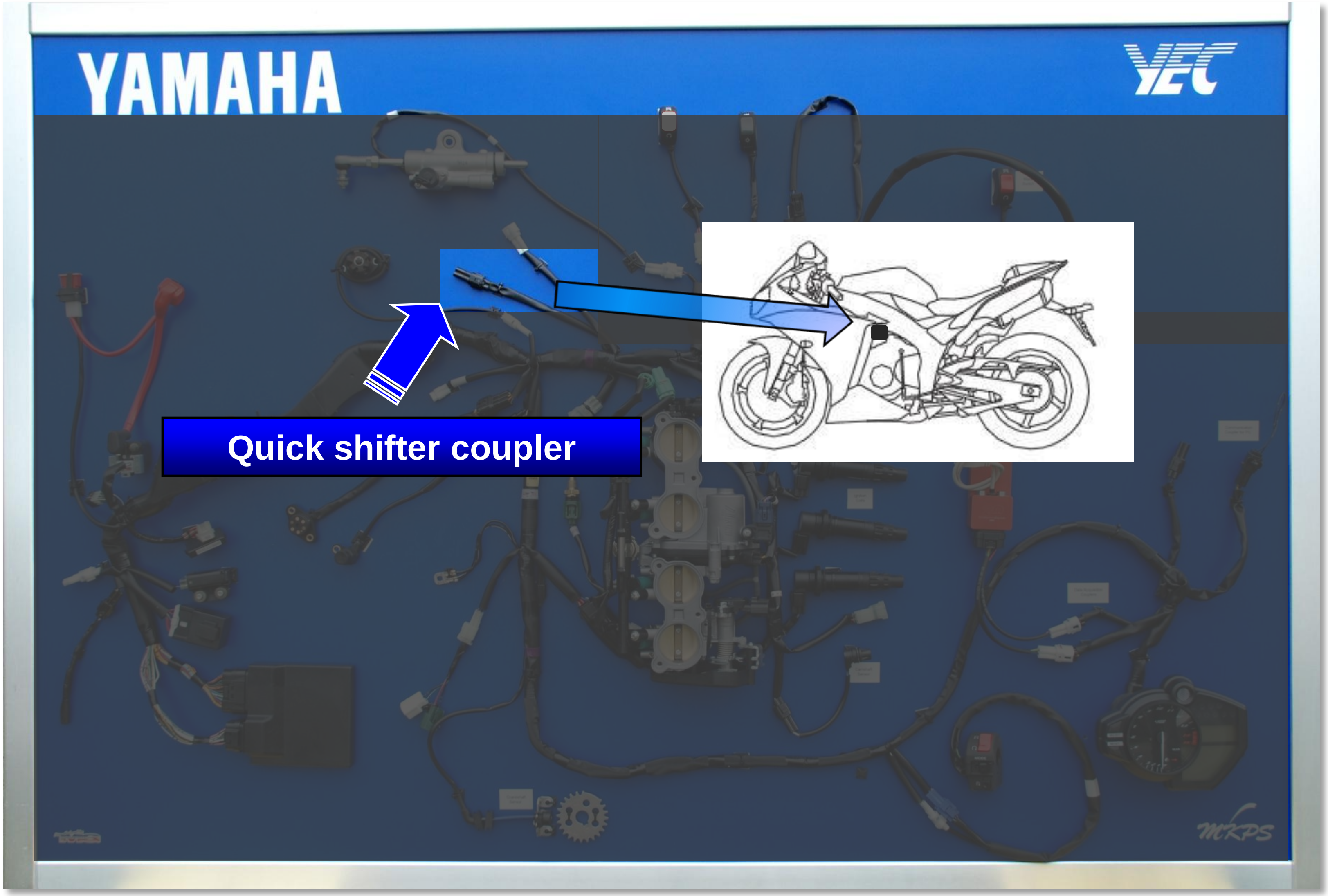


Select MAP Switch

Select Base MAP :

Plugged = Superbike

Unplugged = Superstock


YAMAHA
Quick shifter coupler

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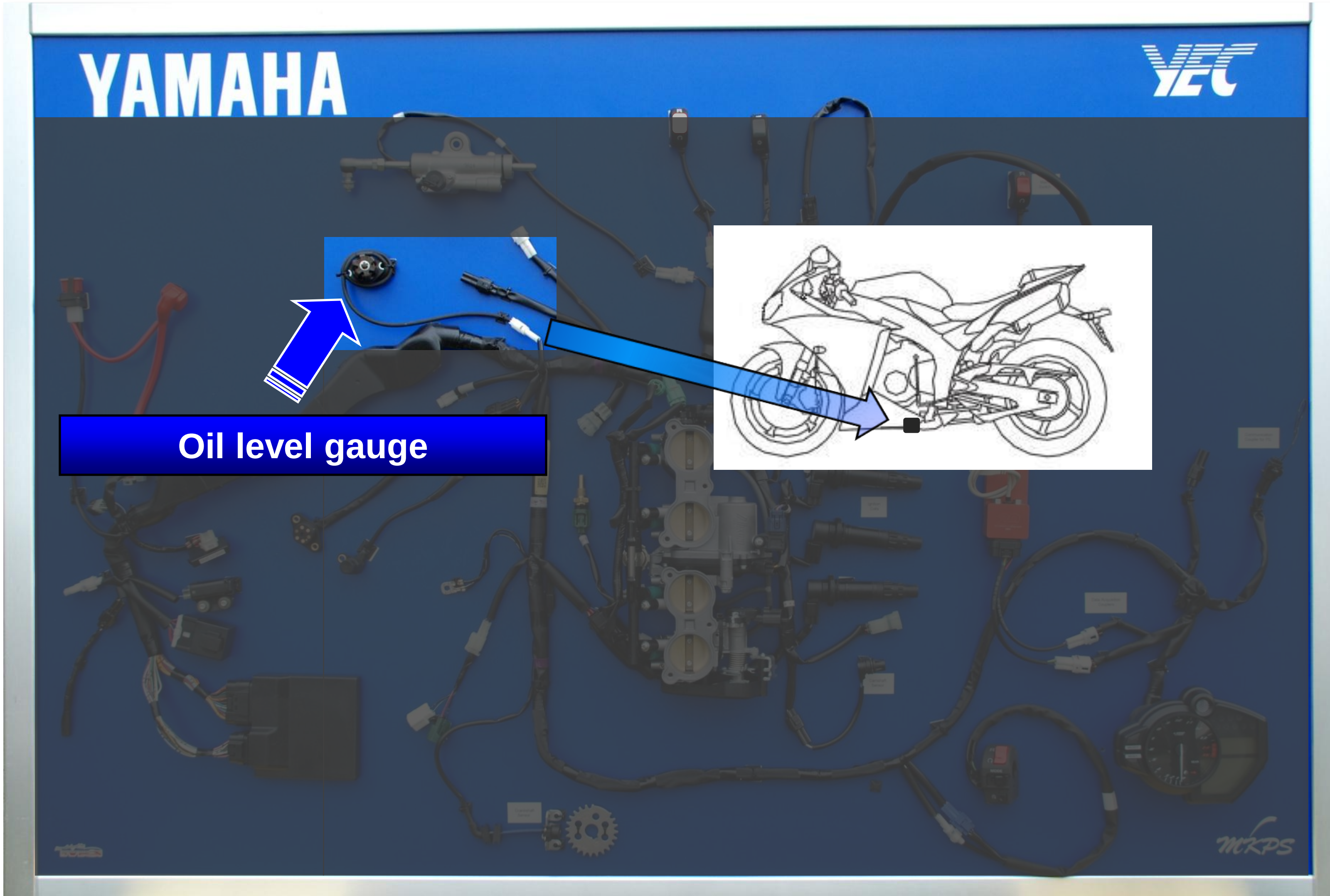

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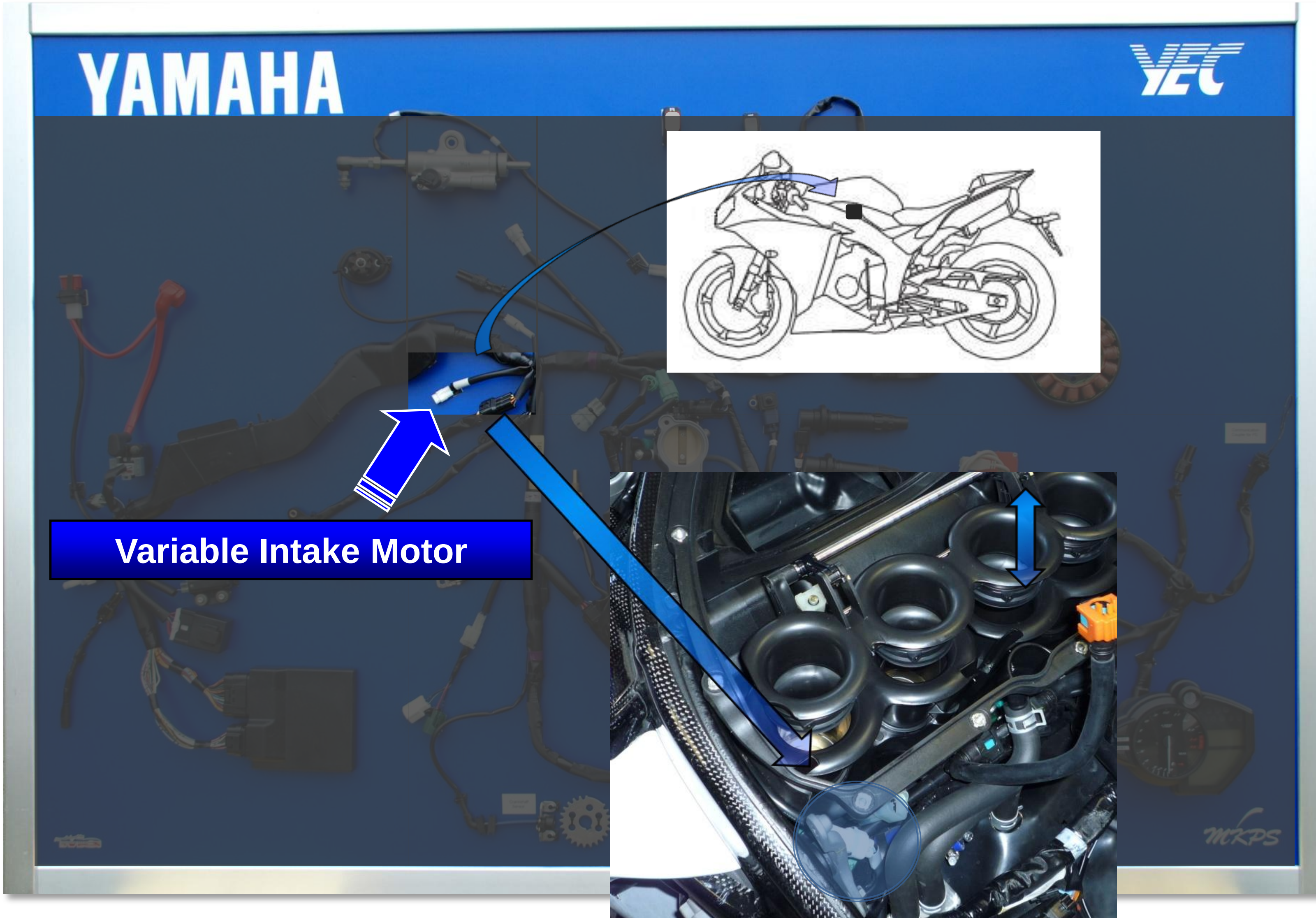
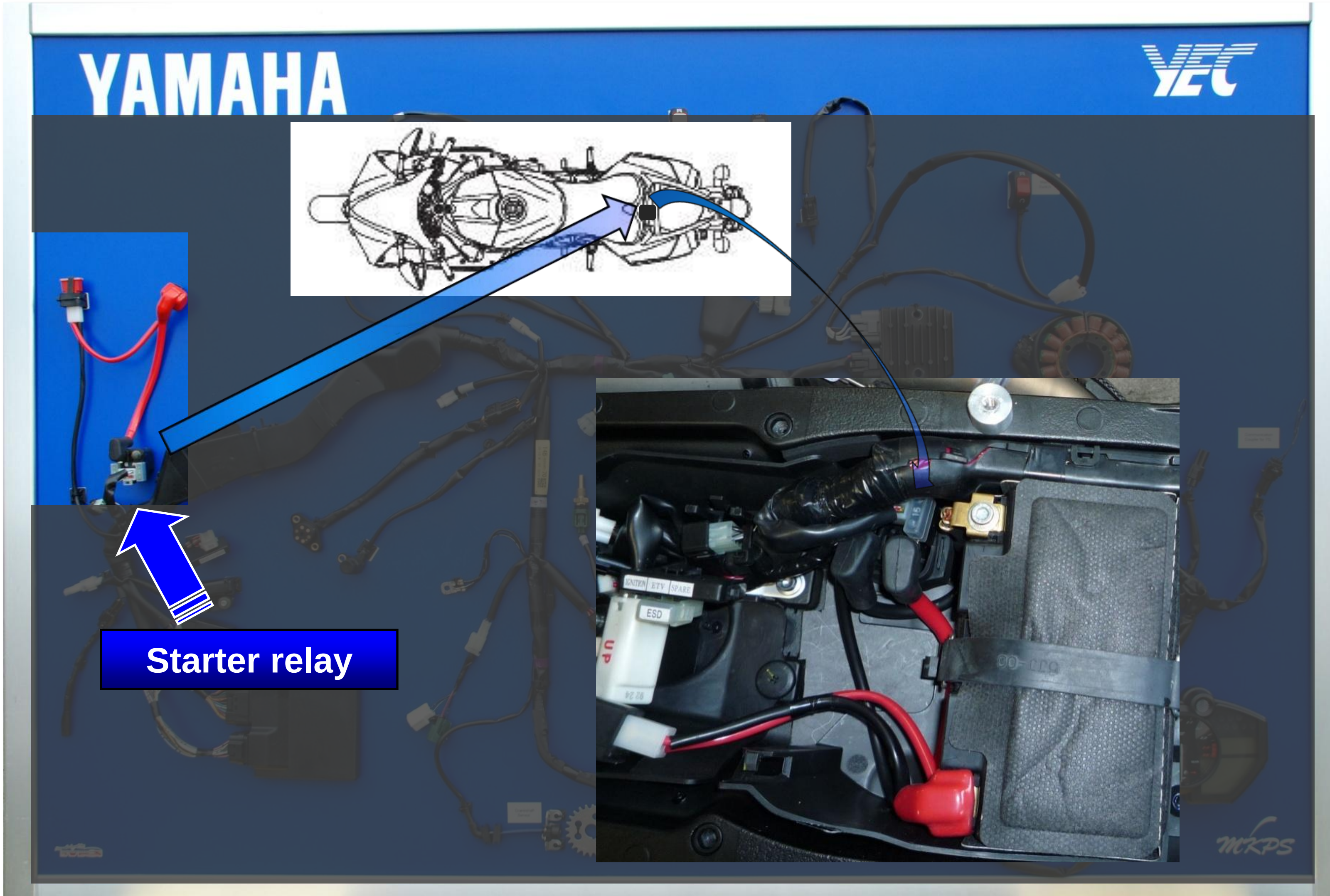

YAMAHA
Variable Intake Motor


YAMAHA
Starter relay

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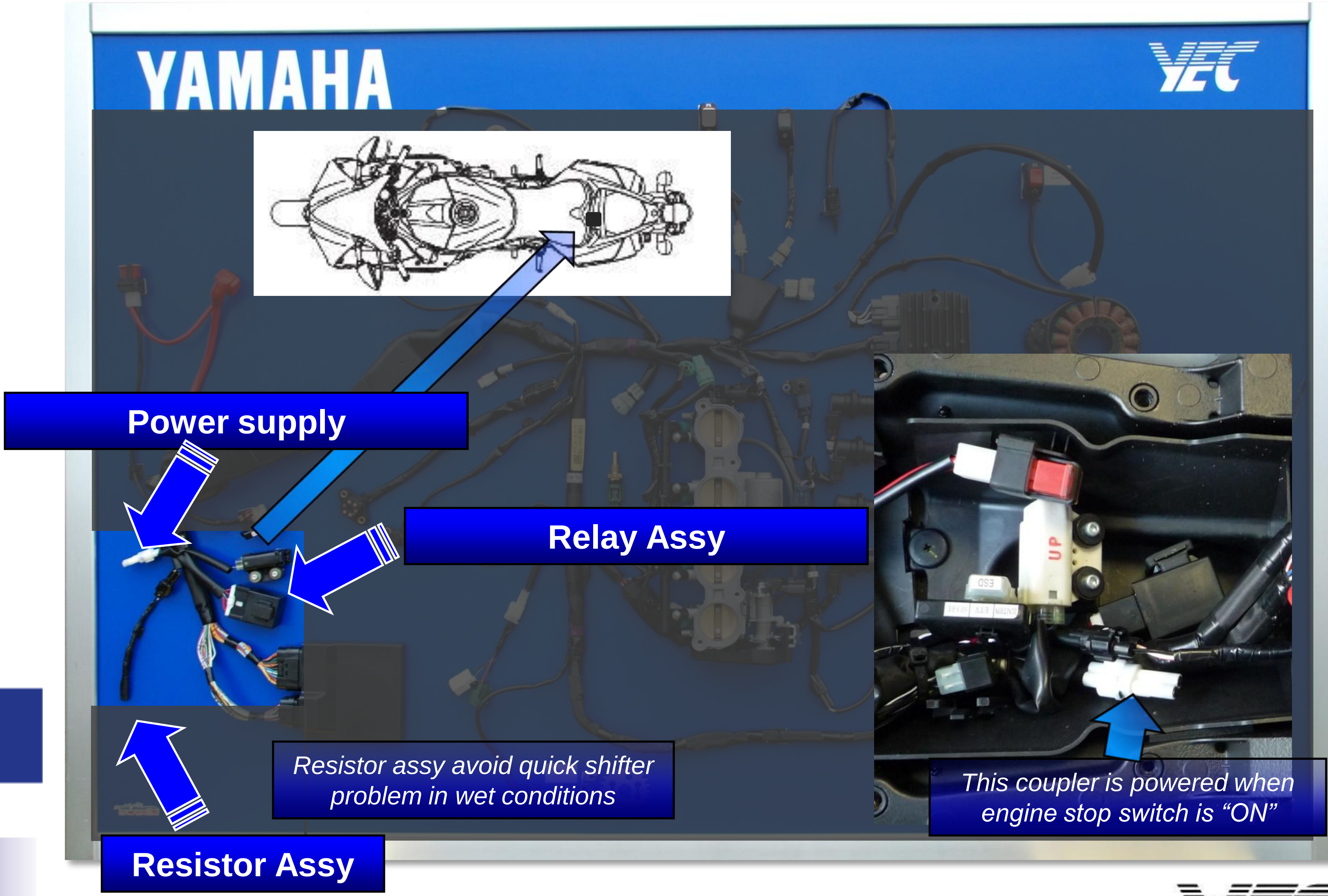

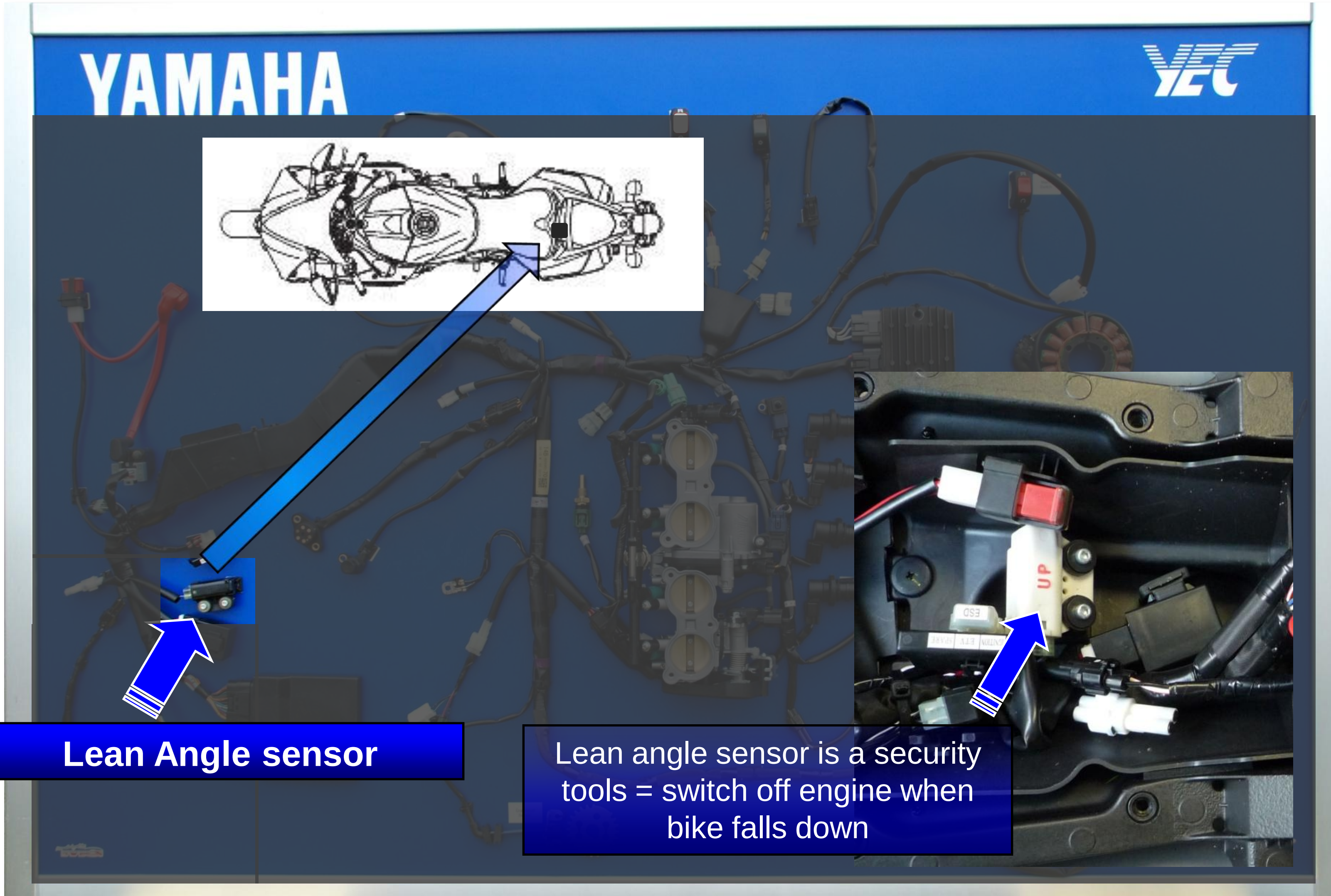

Lean Angle sensor

Lean angle sensor is a security tools = switch off engine when bike falls down

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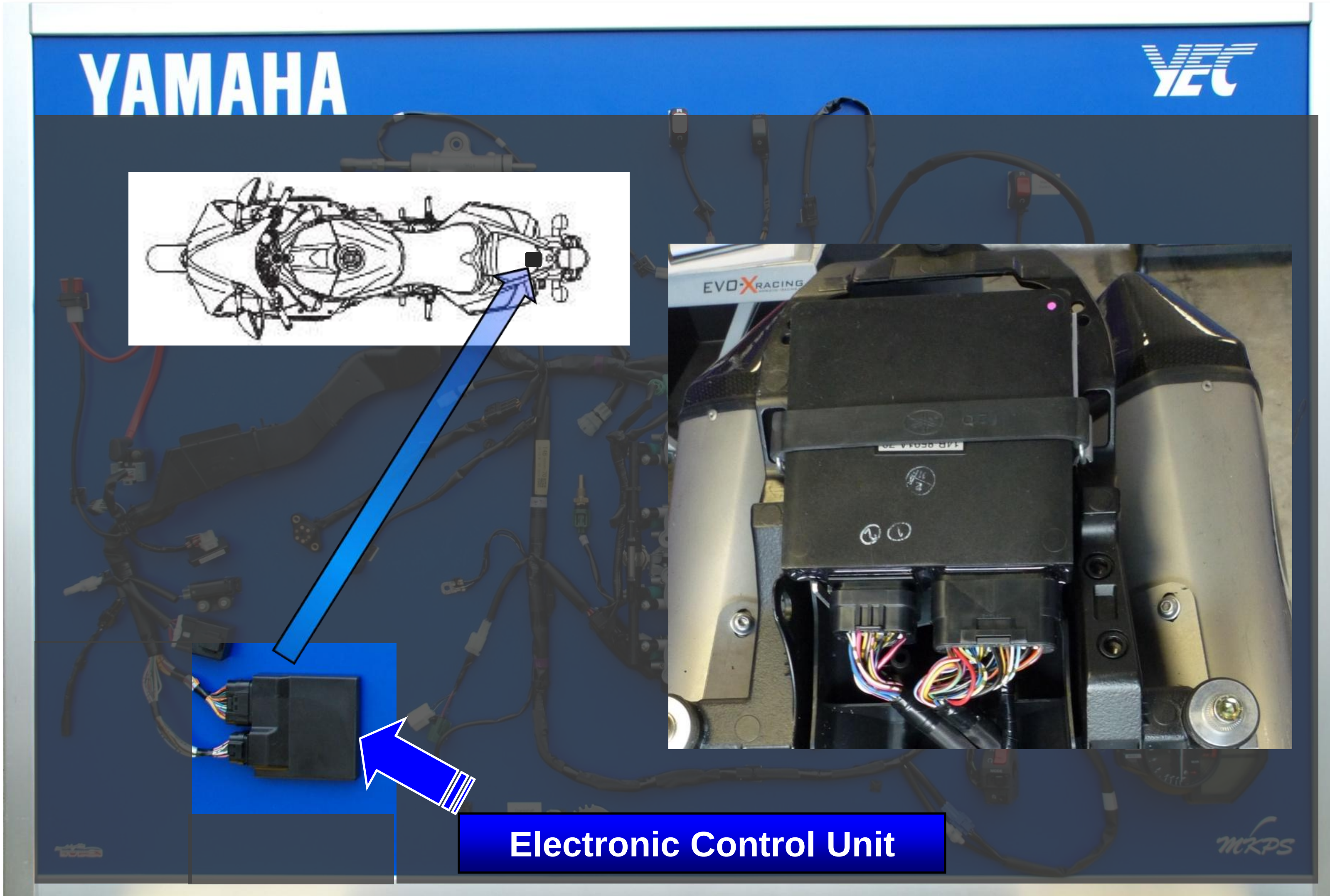

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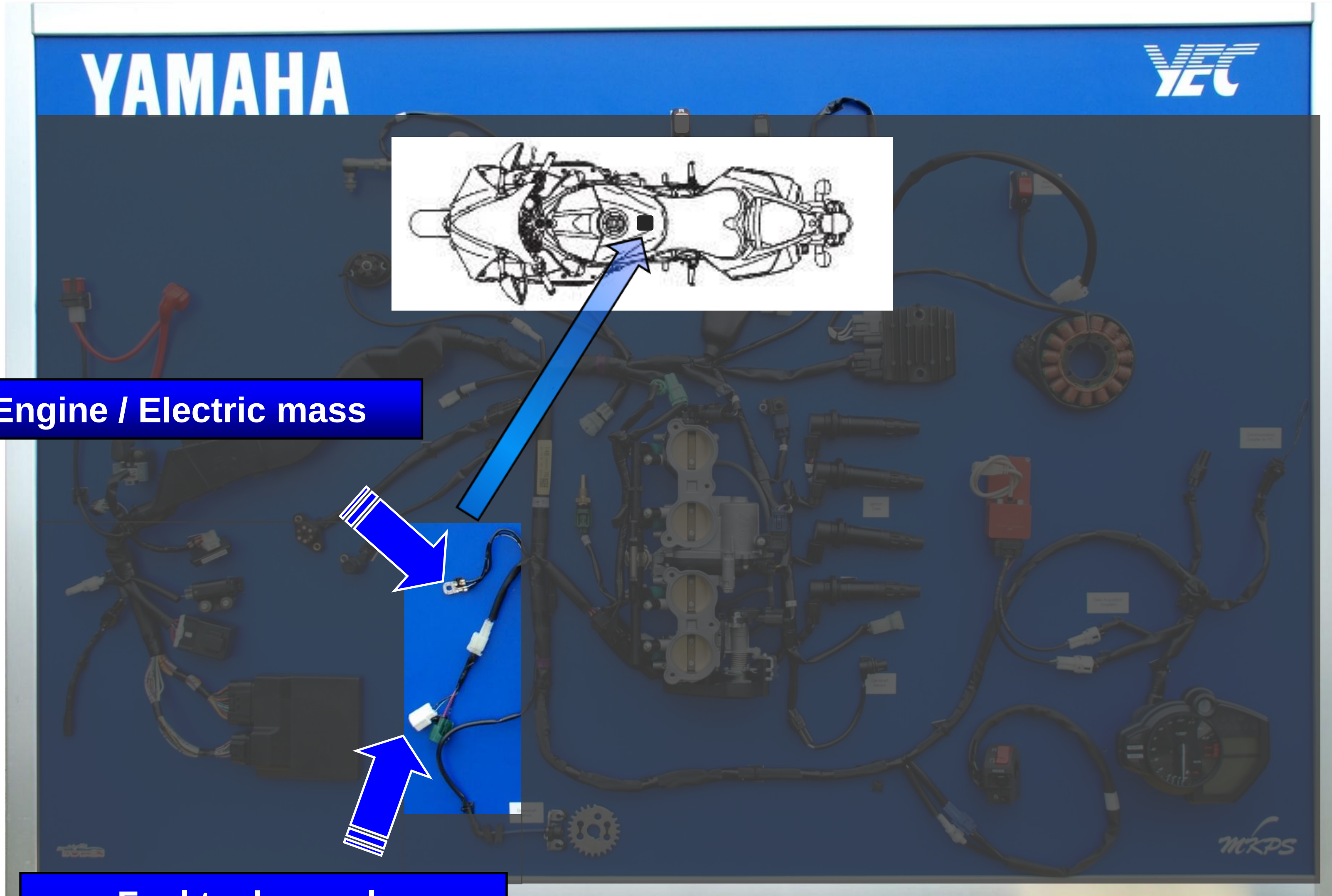
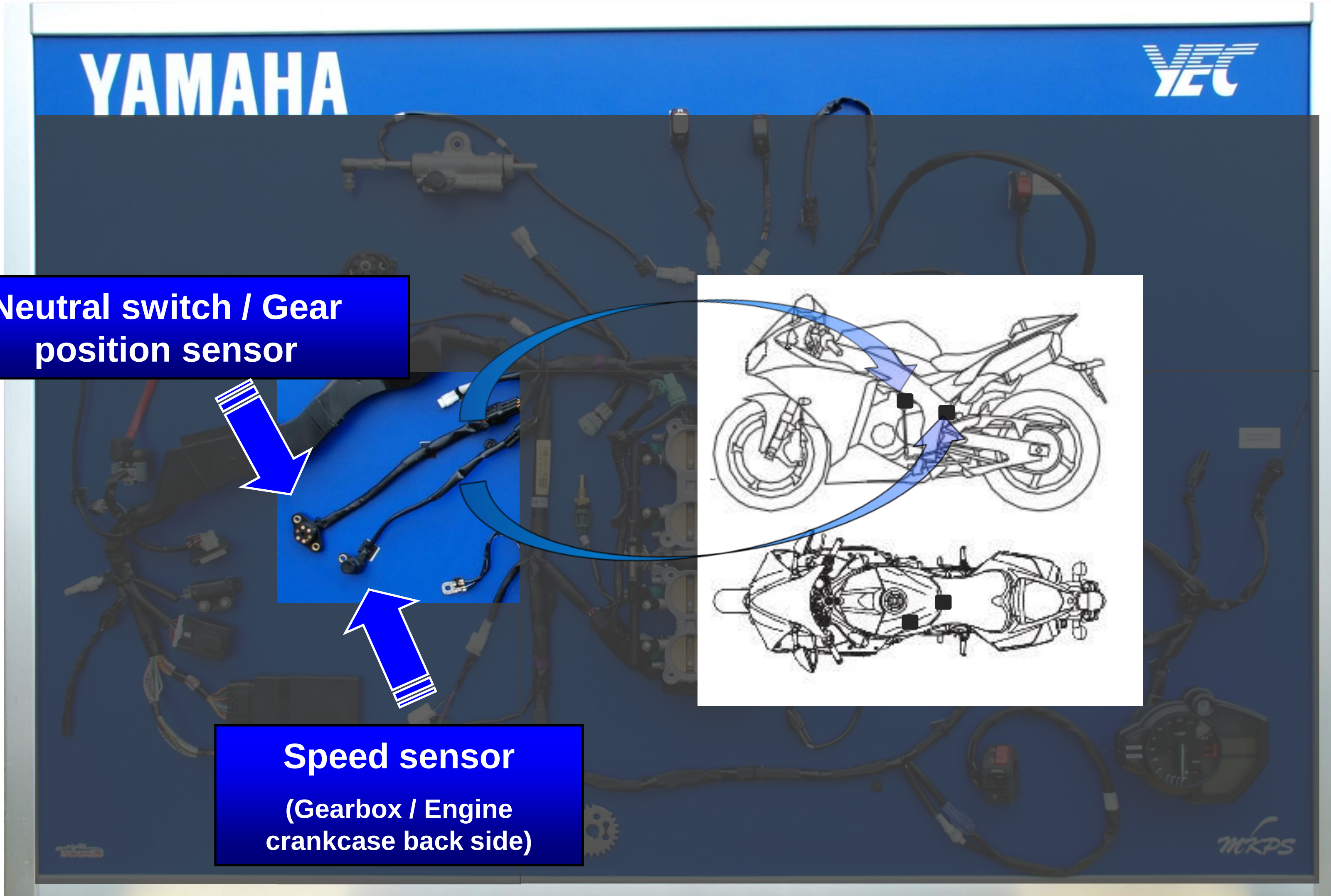
Motorcycle Kit Parts Support



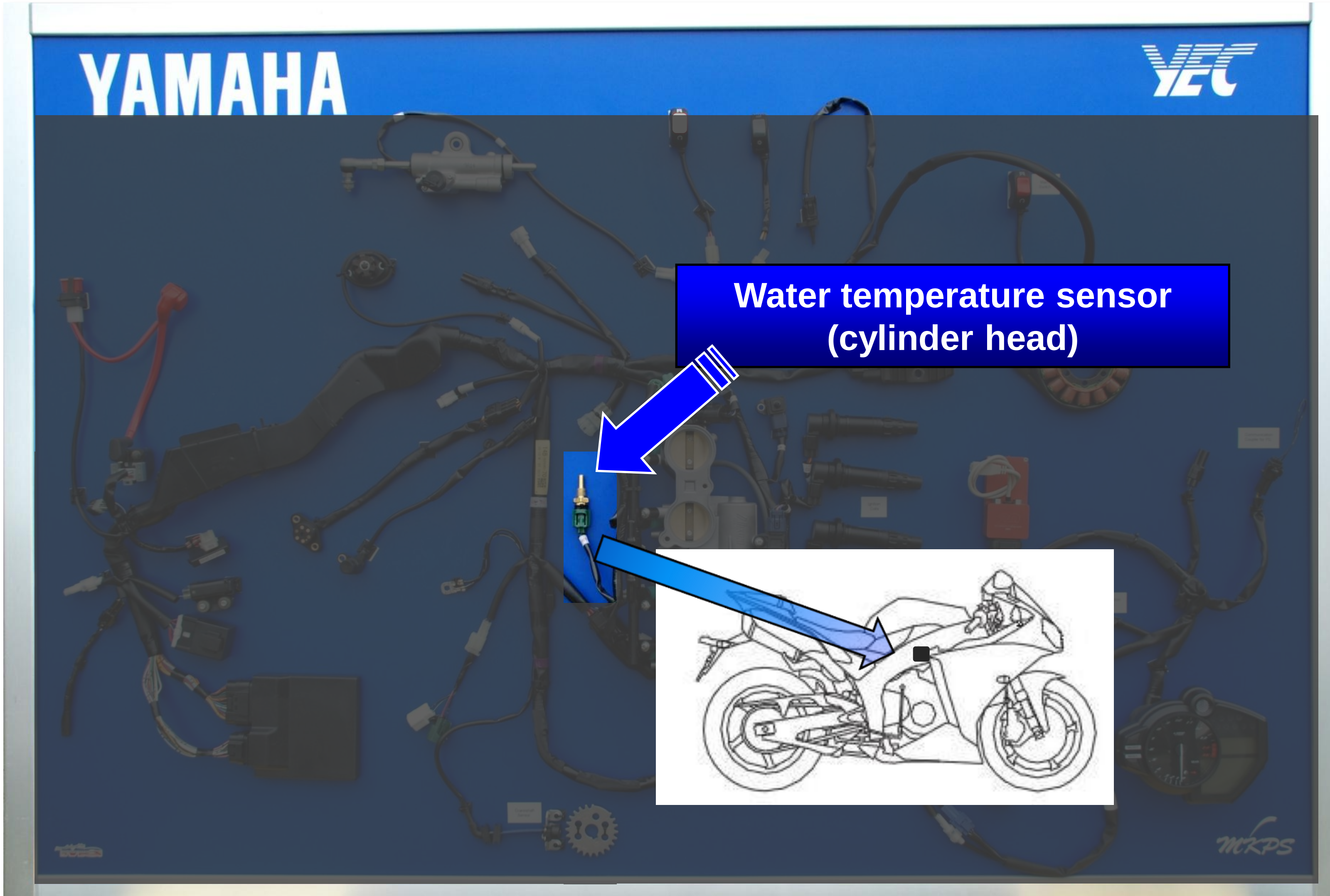
Engine / Electric mass

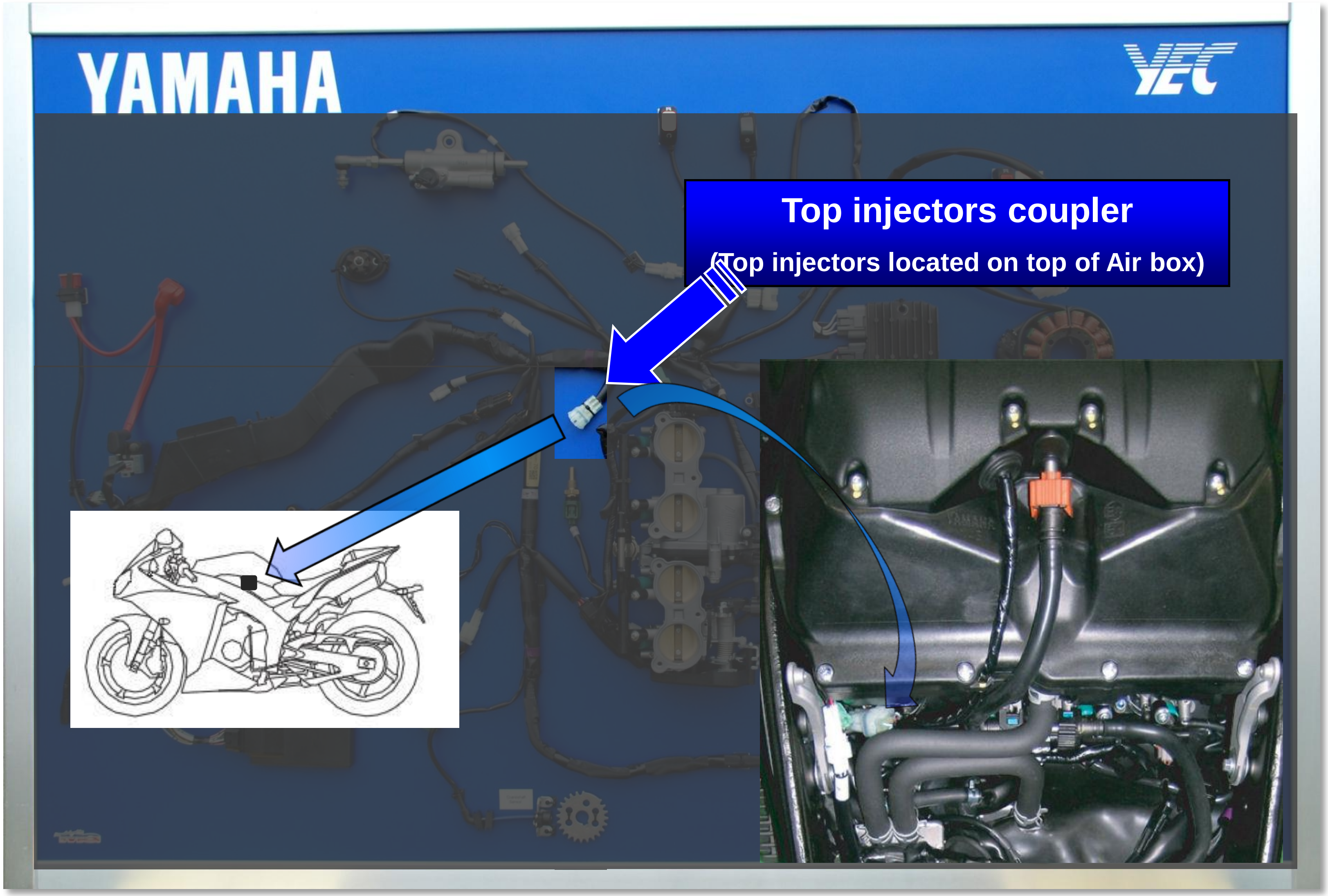
Fuel tank coupler

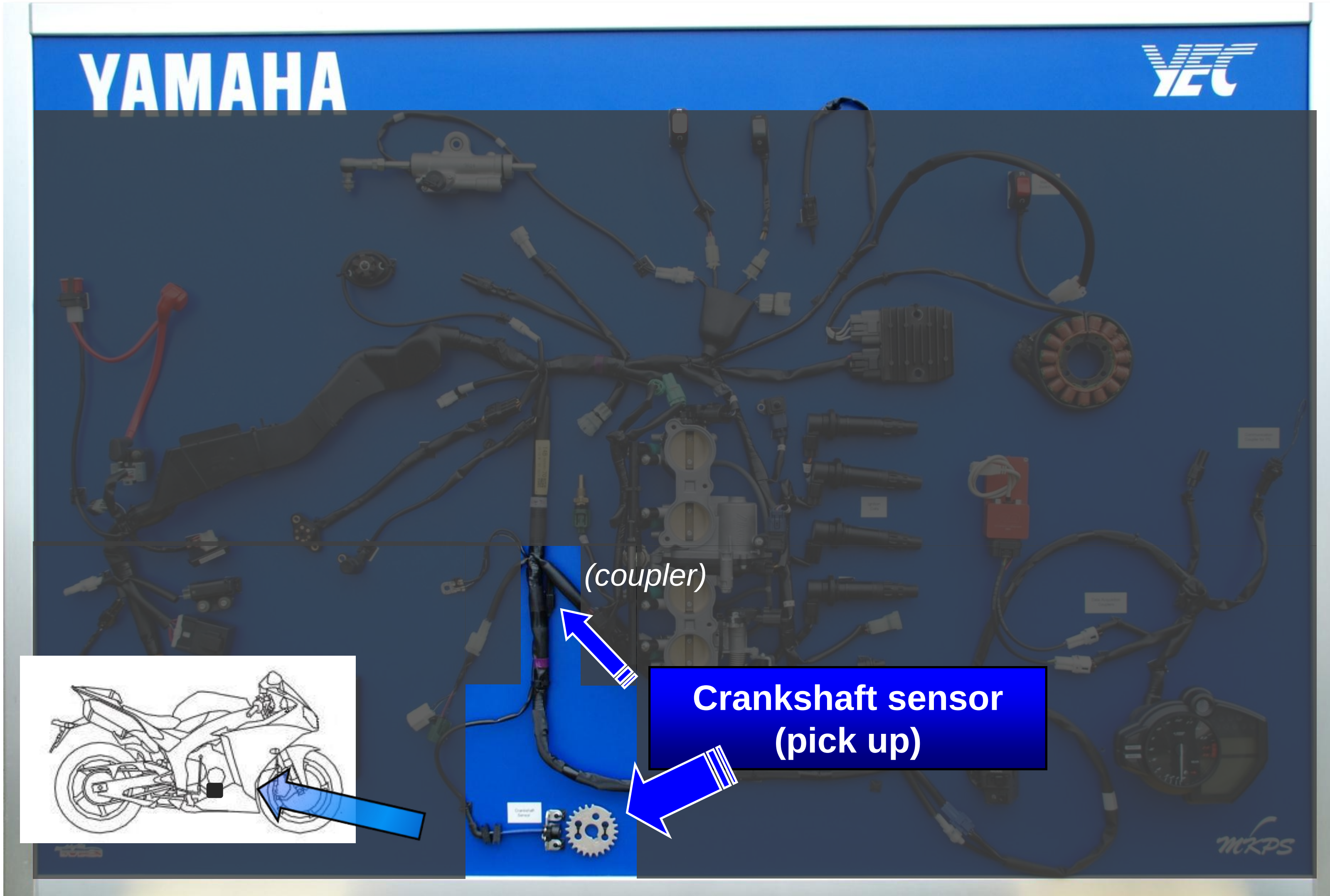
(Pump and Gauge)

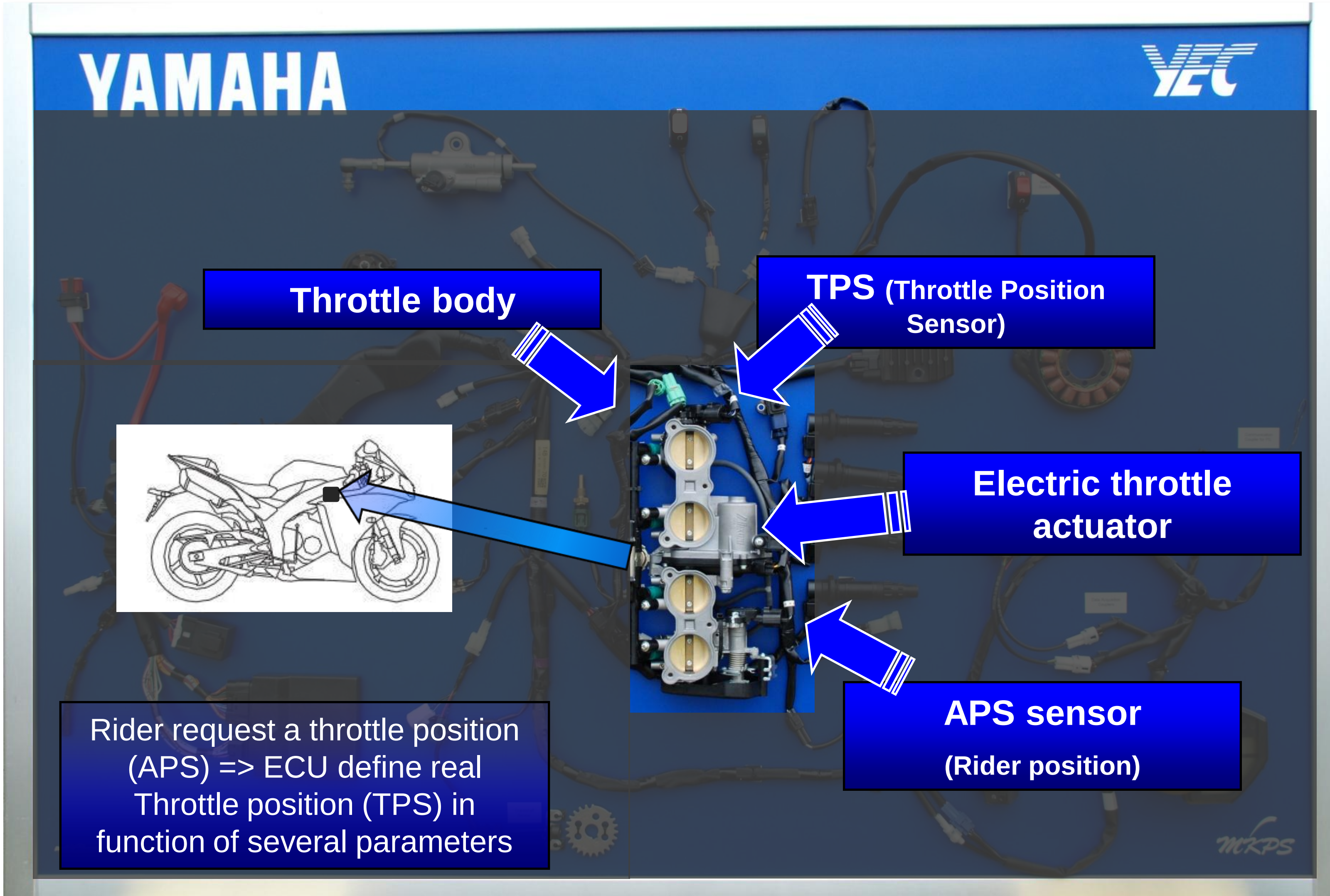

YAMAHA
Neutral switch / Gear position sensor
Speed sensor
(Gearbox / Engine crankcase back side)

TL n°5




YAMAHA
YEC
Top injectors coupler
(Top injectors located on top of Air box)


YAMAHA
YEC
(coupler)
Crankshaft sensor
(pick up)


YAMAHA
Throttle body
TPS (Throttle Position Sensor)
Electric throttle actuator
APS sensor
(Rider position)
Rider request a throttle position (APS) => ECU define real Throttle position (TPS) in function of several parameters

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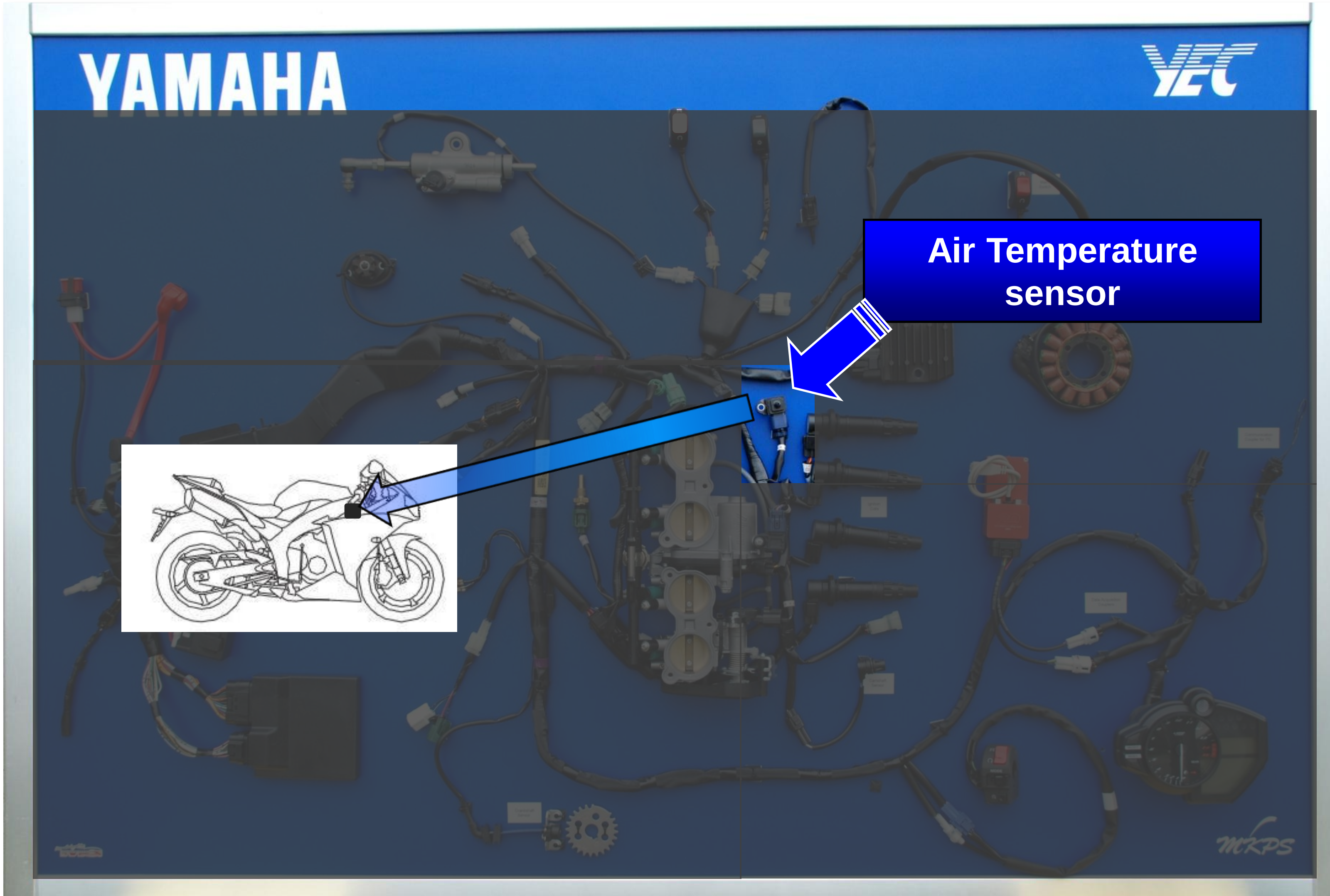

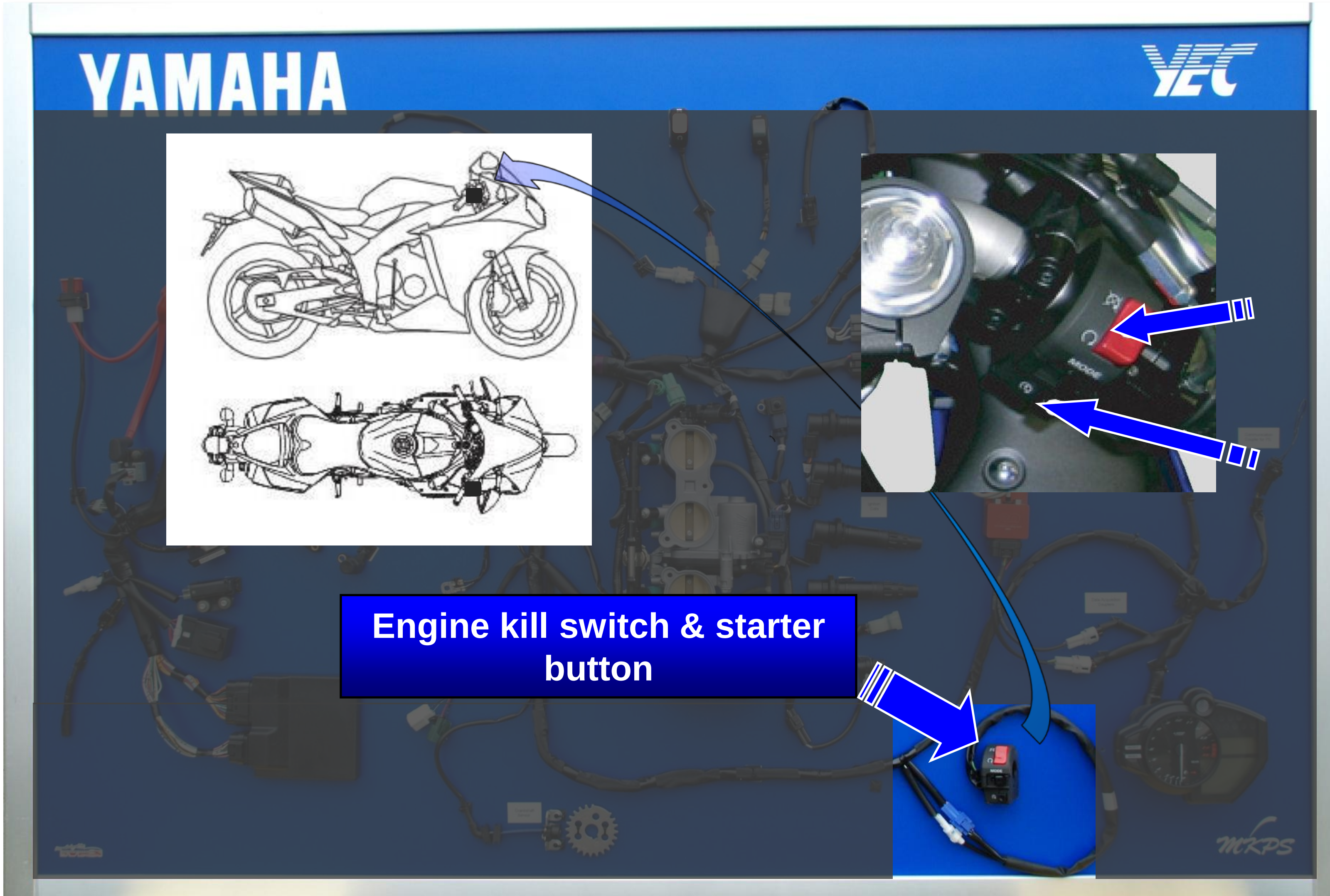
YAMAHA
Engine kill switch & starter button

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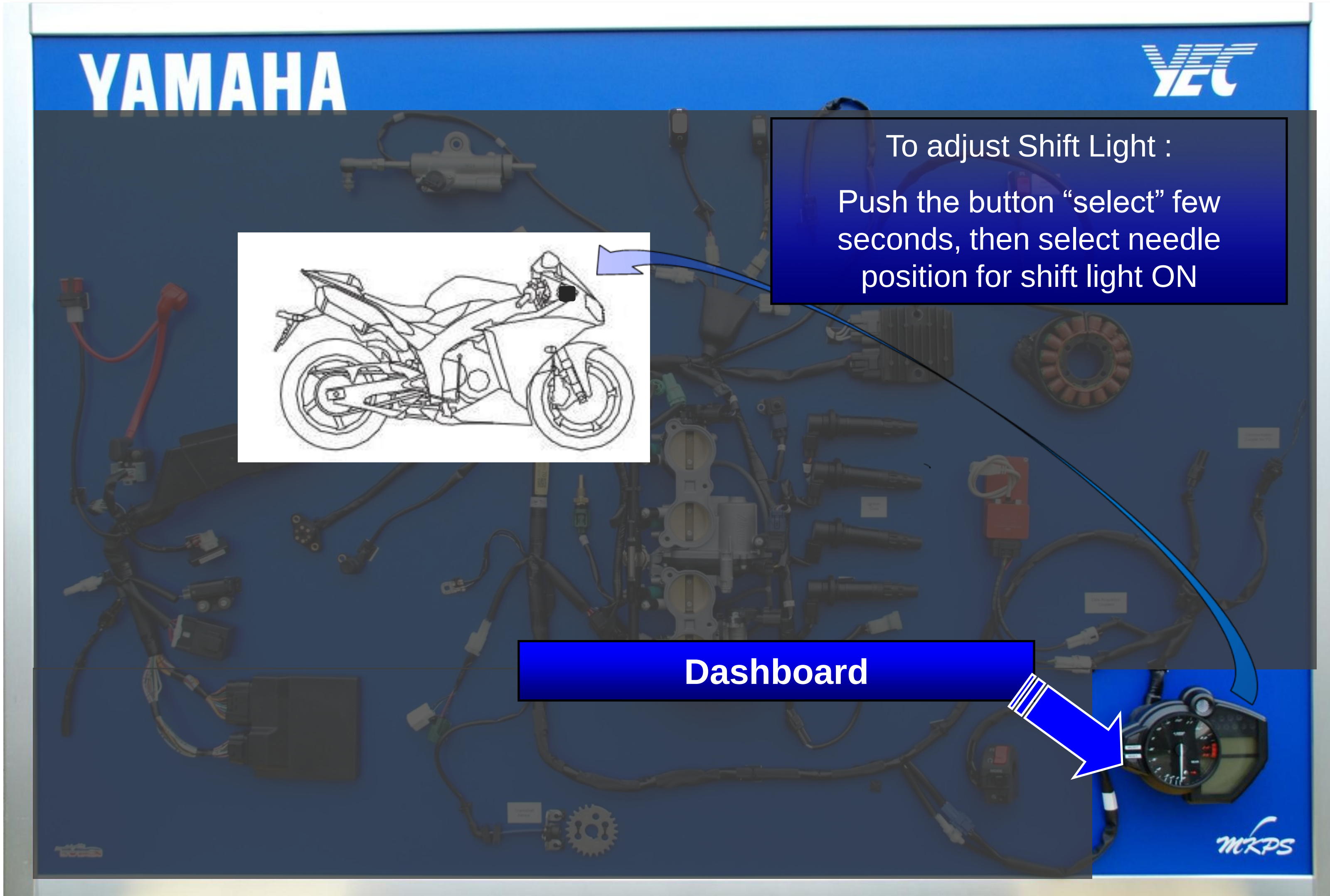
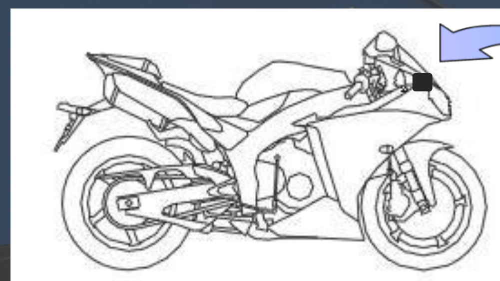
TL n°5



To adjust Shift Light :

Push the button “select” few seconds, then select needle position for shift light ON

yamaha-racing parts.com



- 2 pins coupler = power supply

(Black = GND ; Red/White = Power)

- 4 pins coupler = signals

(Green/White = Water temperature ; White/Yellow = Bike Speed ; Yellow = Throttle Position Sensor ; Yellow/Black = Engine revolution)

Data acquisition couplers

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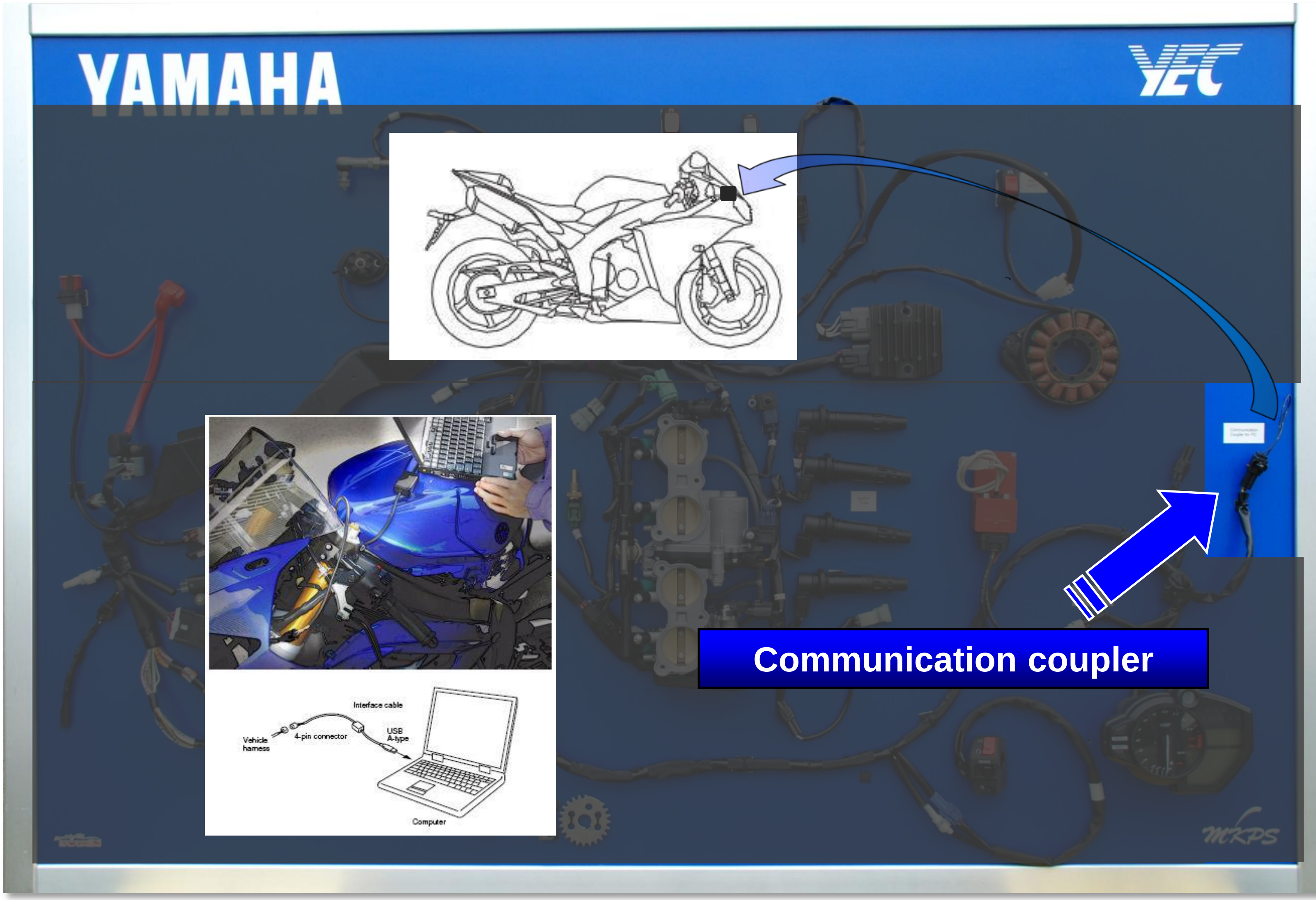

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Motorcycle Kit Parts Support

Wire Harness Reference Table

Year / Model	R1 ECU	R1 Wire Harness
2010	14B-8591A-71	14B-F2590-70
2009	14B-8591A-70	14B-F2590-70
2008	4C8-8591A-80	4C8-F2590-80
2007	4C8-8591A-70	4C8-F2590-70
2006	5VY-8591A-72	5VY-F2590-71
2005	5VY-8591A-71	5VY-F2590-70
2004	5VY-8591A-70	5VY-82590-70

YEC
yamaha-racingparts.com

Next month,

Technical letter n°6 will tackle about camshafts.

TECHNICAL LETTER N°4

Subject:

Racing Kit Wire Harness

For YZF - R6

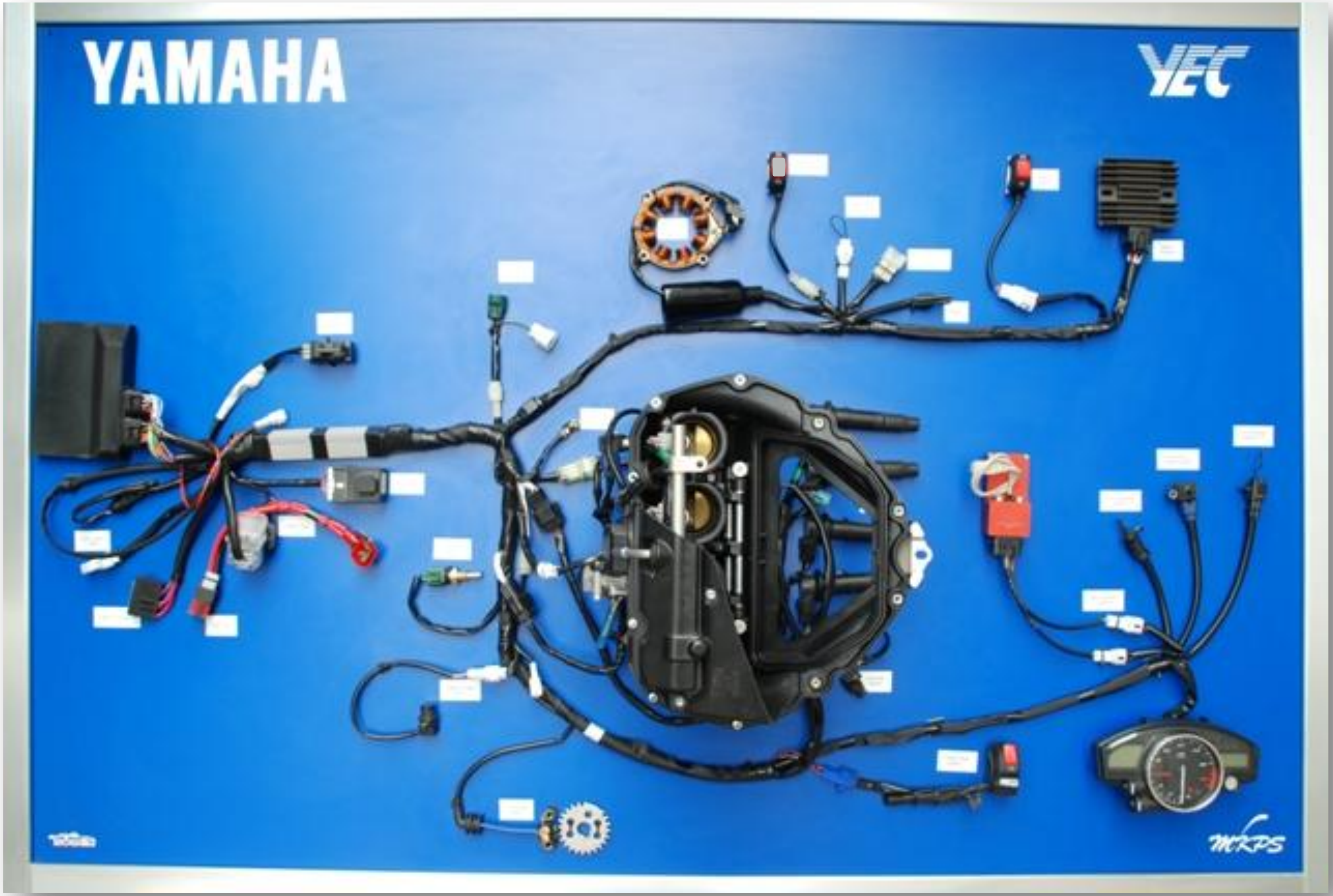
Introduction

To complete previous *Technical Letters,* I present in two *Technical Letters* racing kit wire harness. *TL n°4* is presenting YEC racing kit wire harness for YAMAHA YZF – R6. The *TL n°5* will be dedicated to YZF – R1.
Several pictures will help users to understand functions, to recognise sensors and associated couplers.

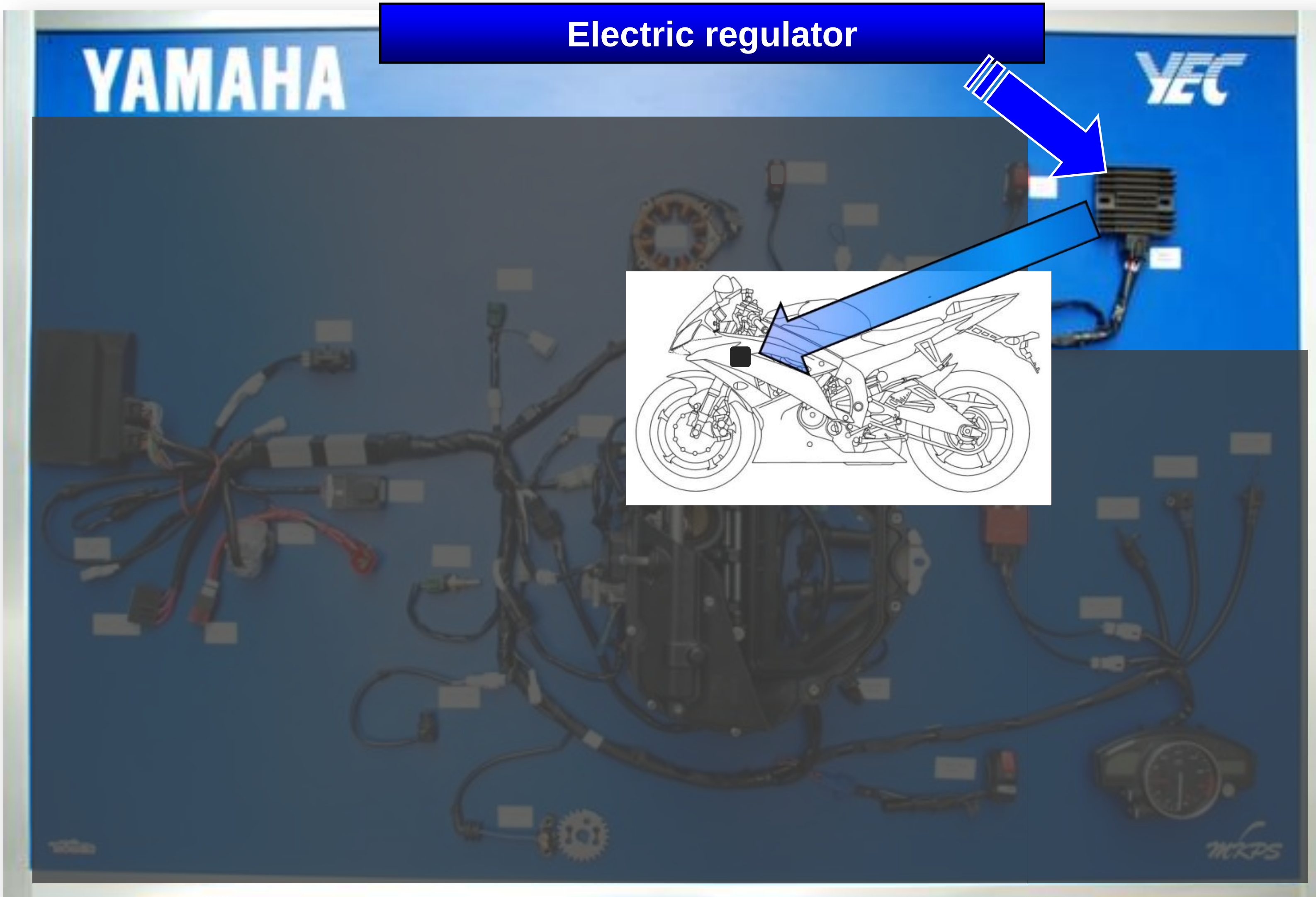
Summary

- General other view of *Racing Kit Wire Harness*
- Detail of each couplers and sensors
- Wire Harness reference table

General over view of YZF – R6 Racing Wire Harness



Detail of each parts of Wire Harness



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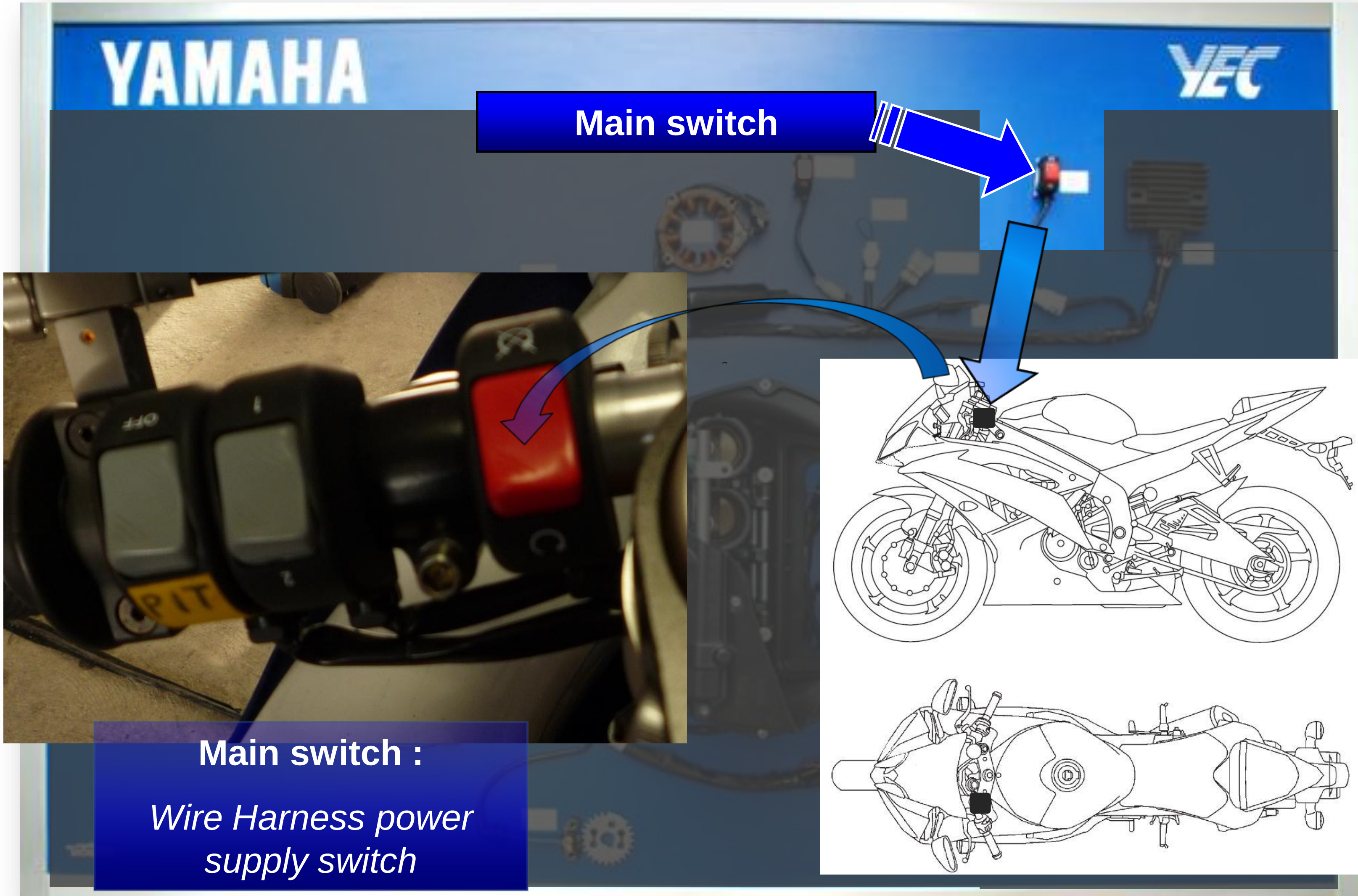

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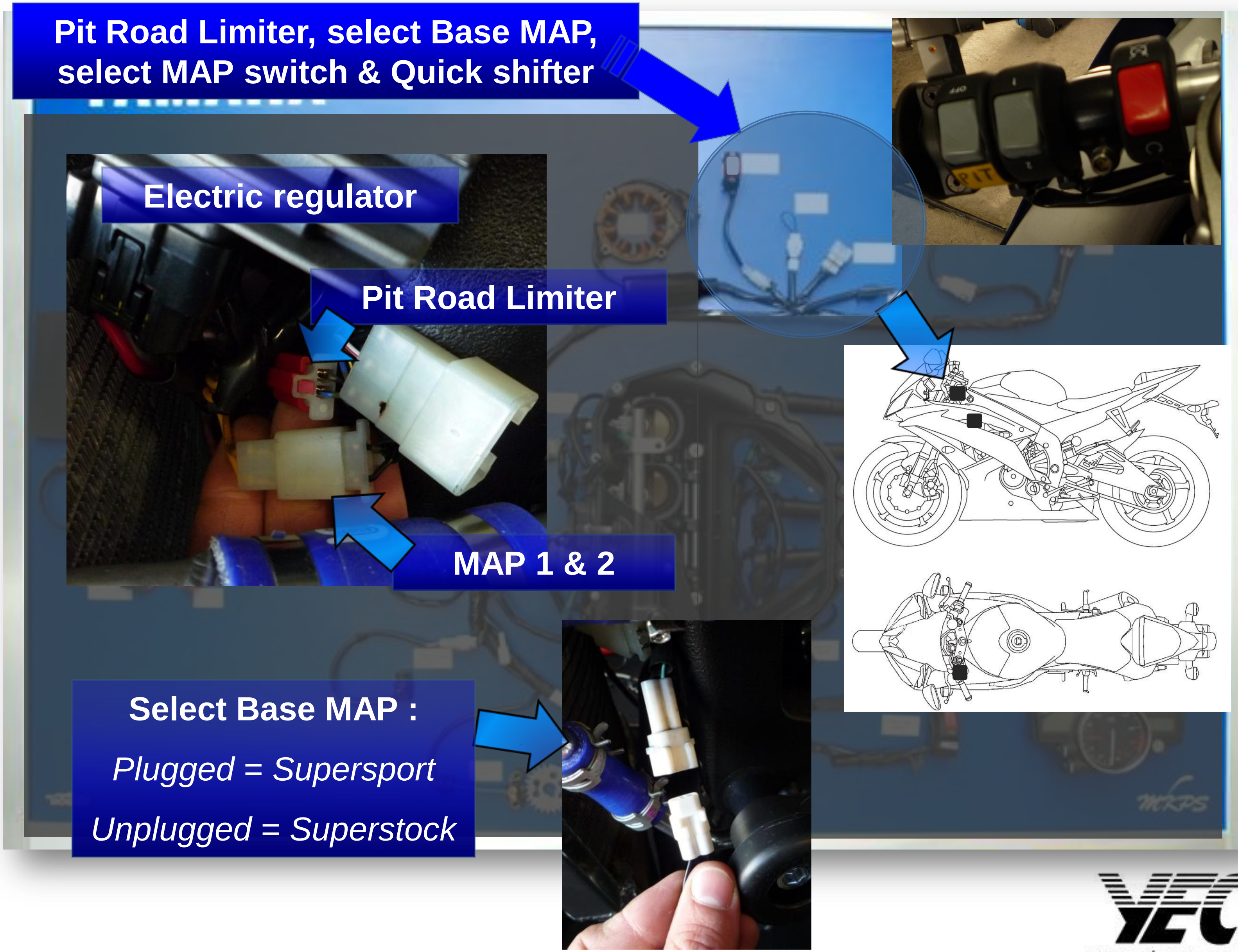
Pit Road Limiter, select Base MAP,
select MAP switch & Quick shifter
Electric regulator
Pit Road Limiter
MAP 1 & 2
Select Base MAP :
Plugged = Supersport
Unplugged = Superstock
PIT

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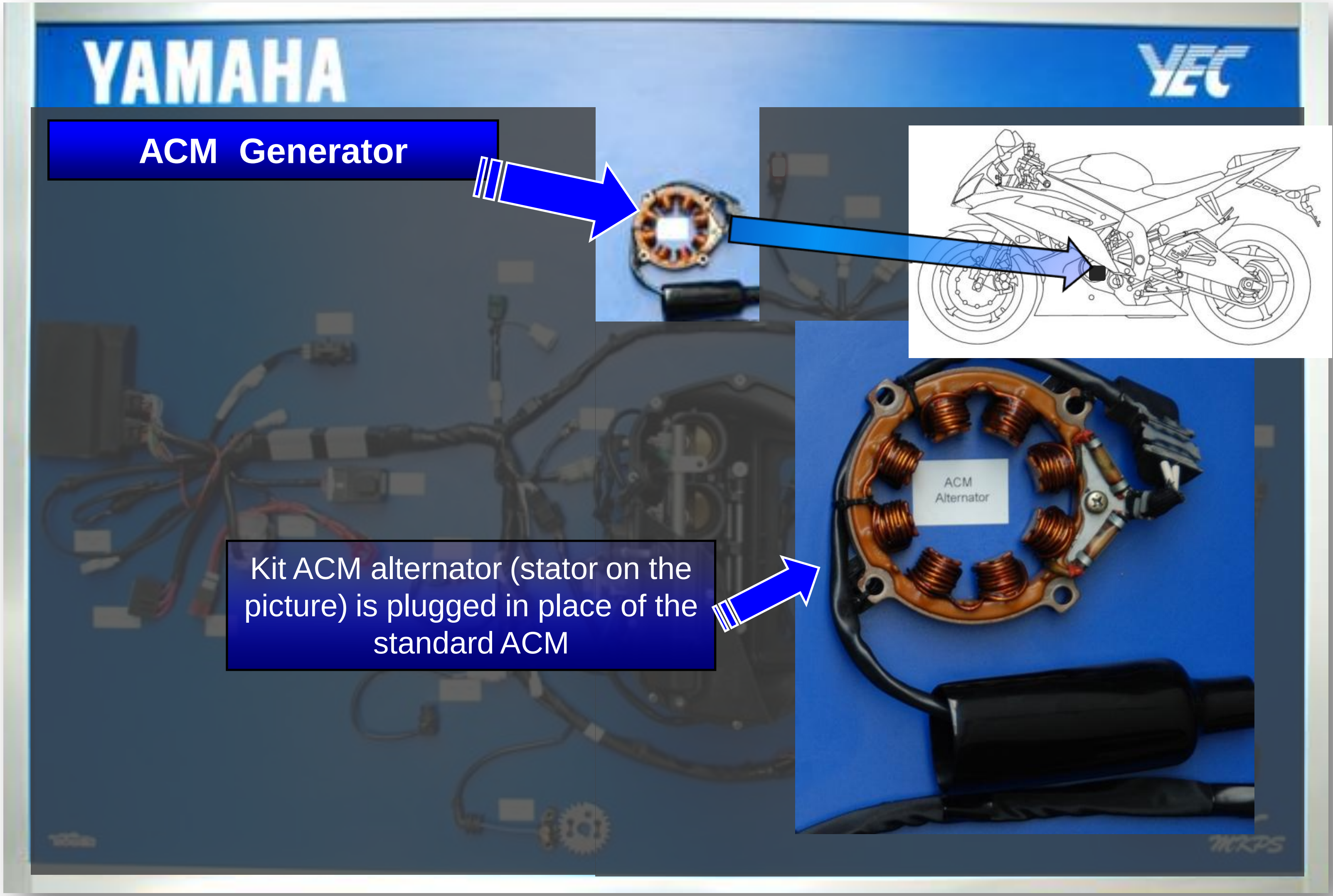
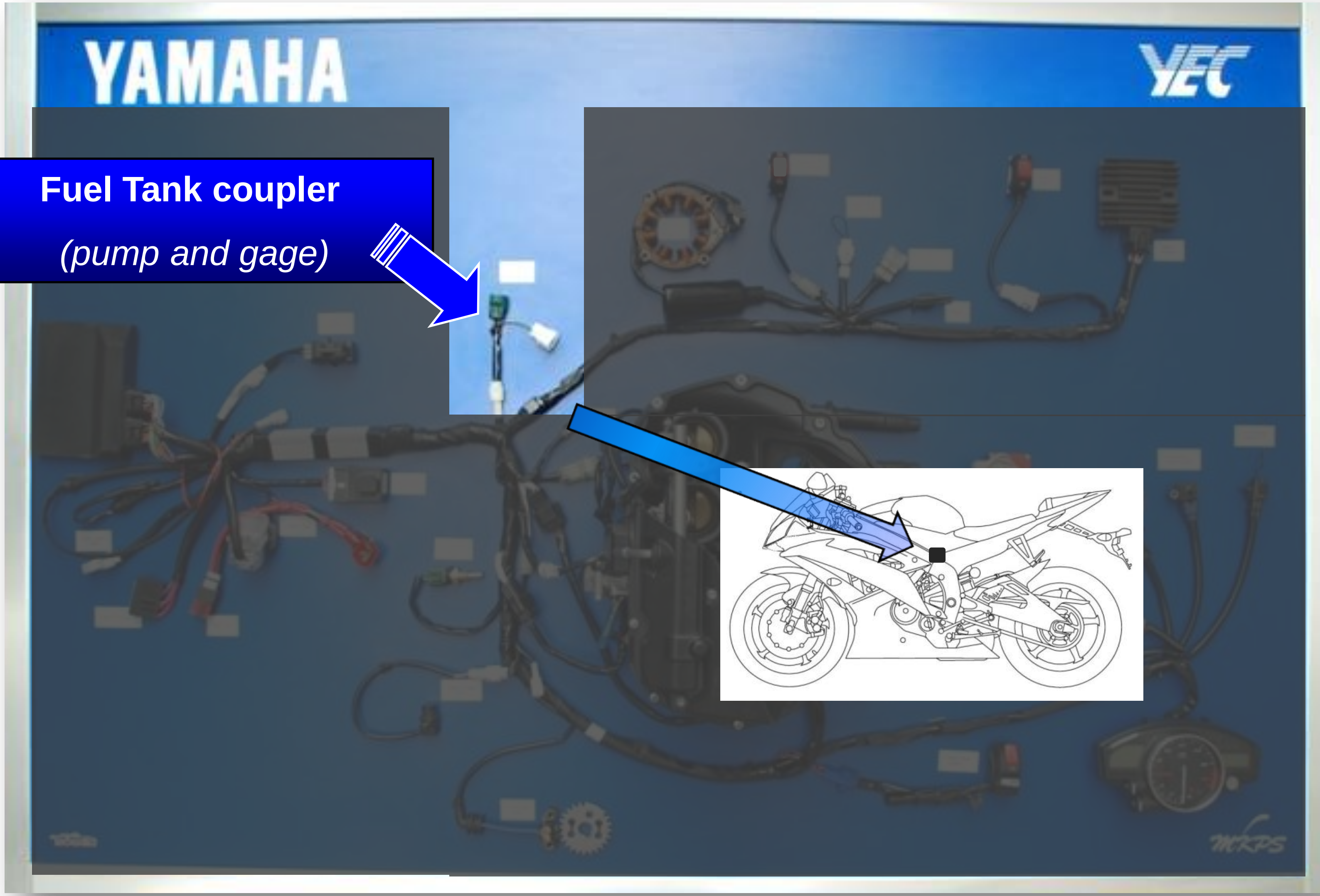
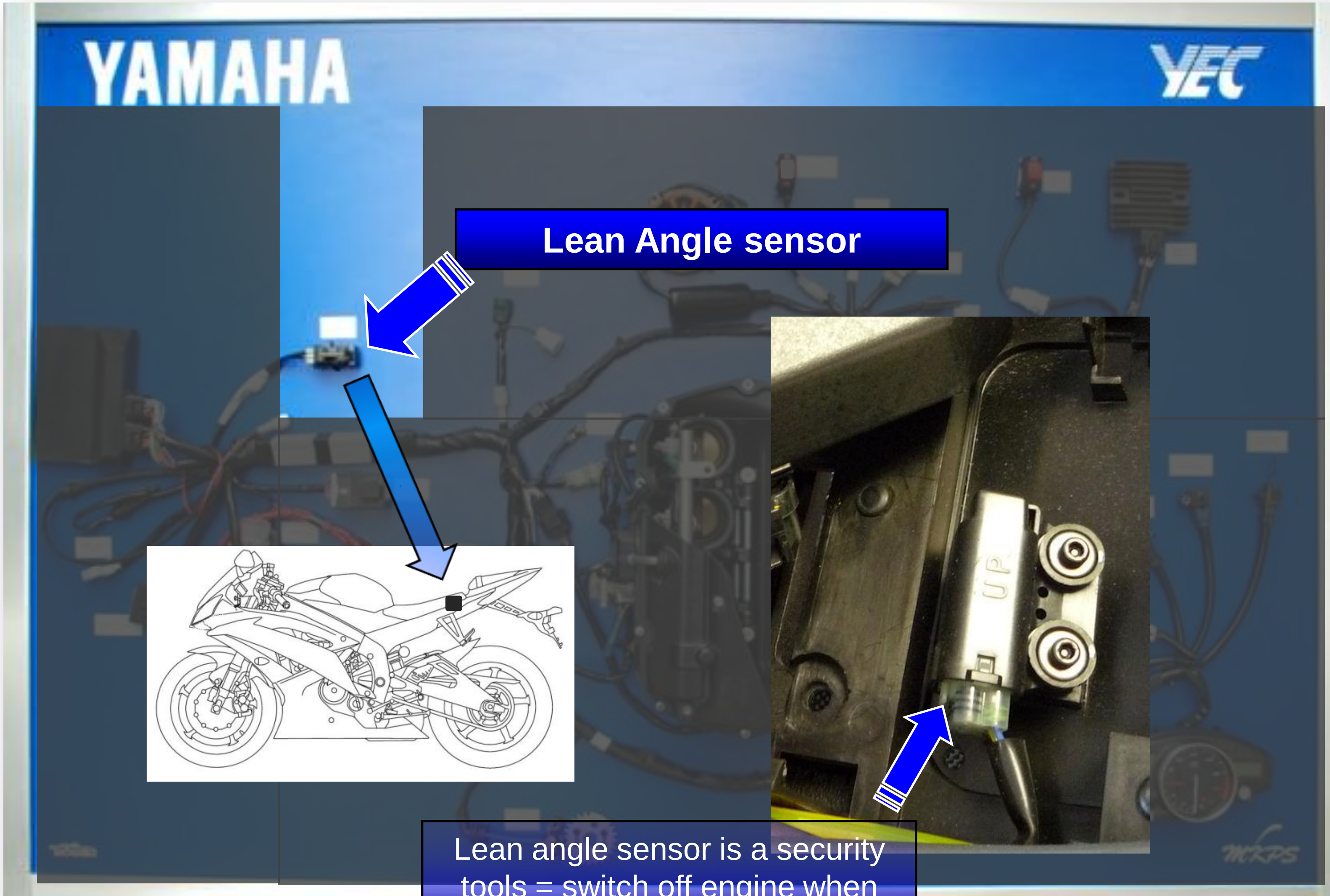
ACM Generator



Kit ACM alternator (stator on the picture) is plugged in place of the standard ACM

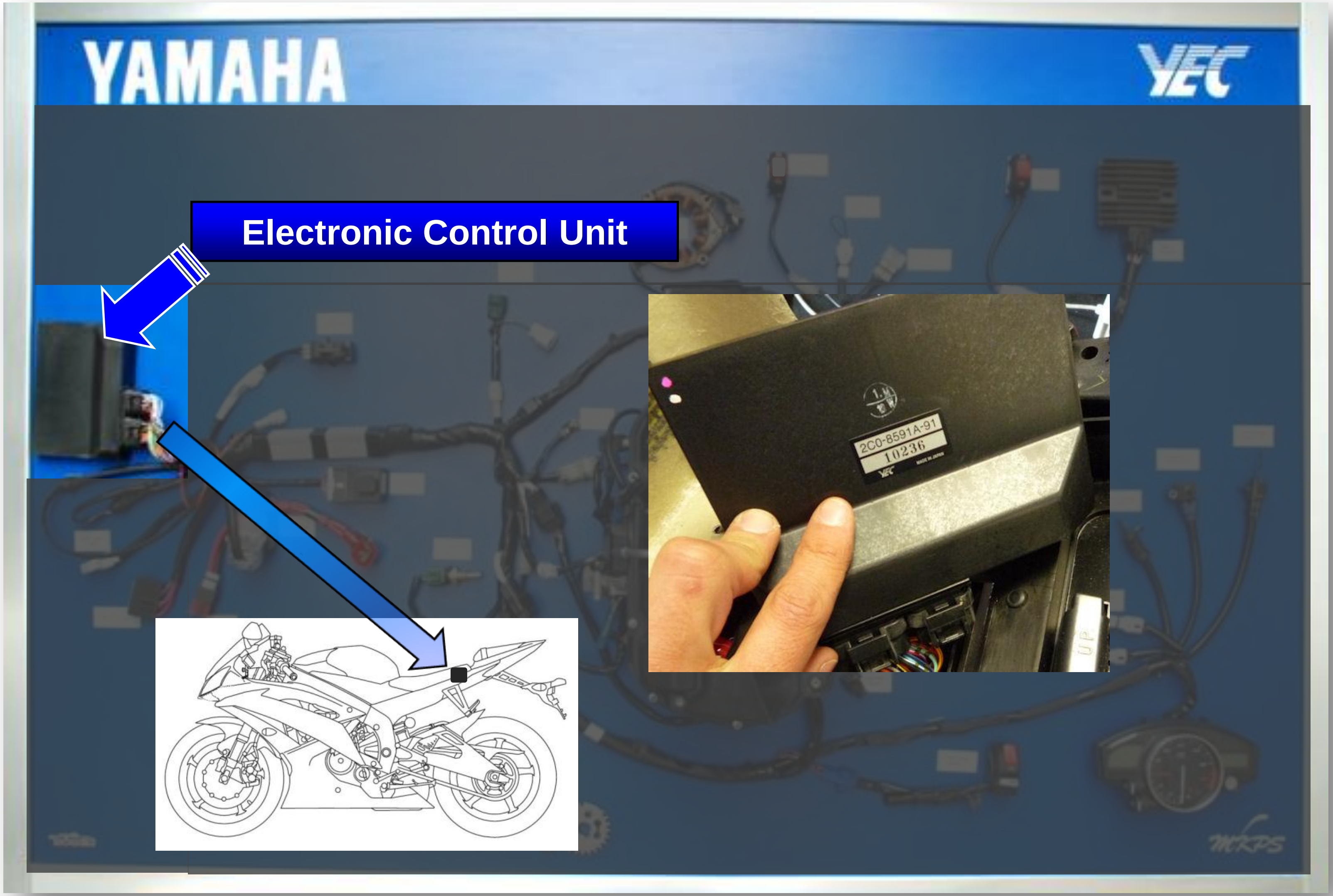

YAMAHA
Fuel Tank coupler
(pump and gage)

Lean Angle sensor



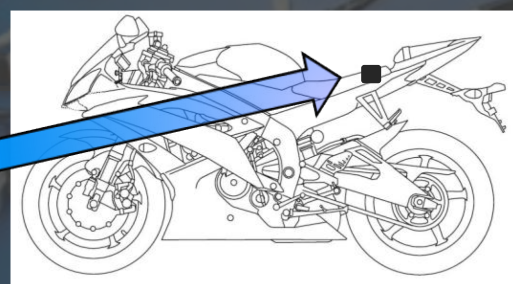
Lean angle sensor is a security tools = switch off engine when bike falls down

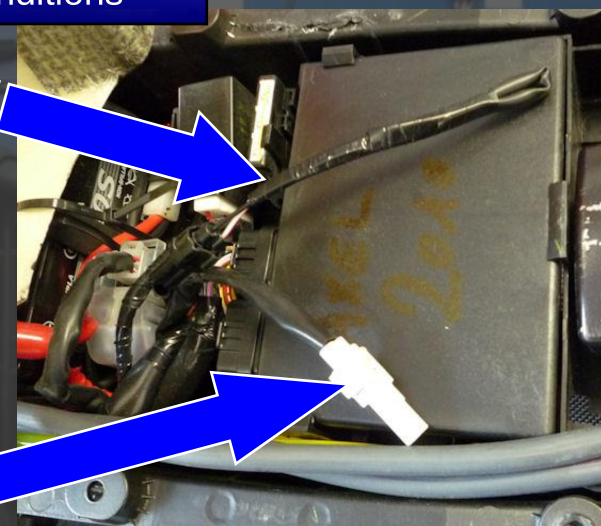
MKPS
Motorcycle Kit Parts Support



Resistor assy avoid quick shifter problem in wet conditions

Resistor Assy





Power supply (rear)

This coupler is powered when engine stop switch is “ON”

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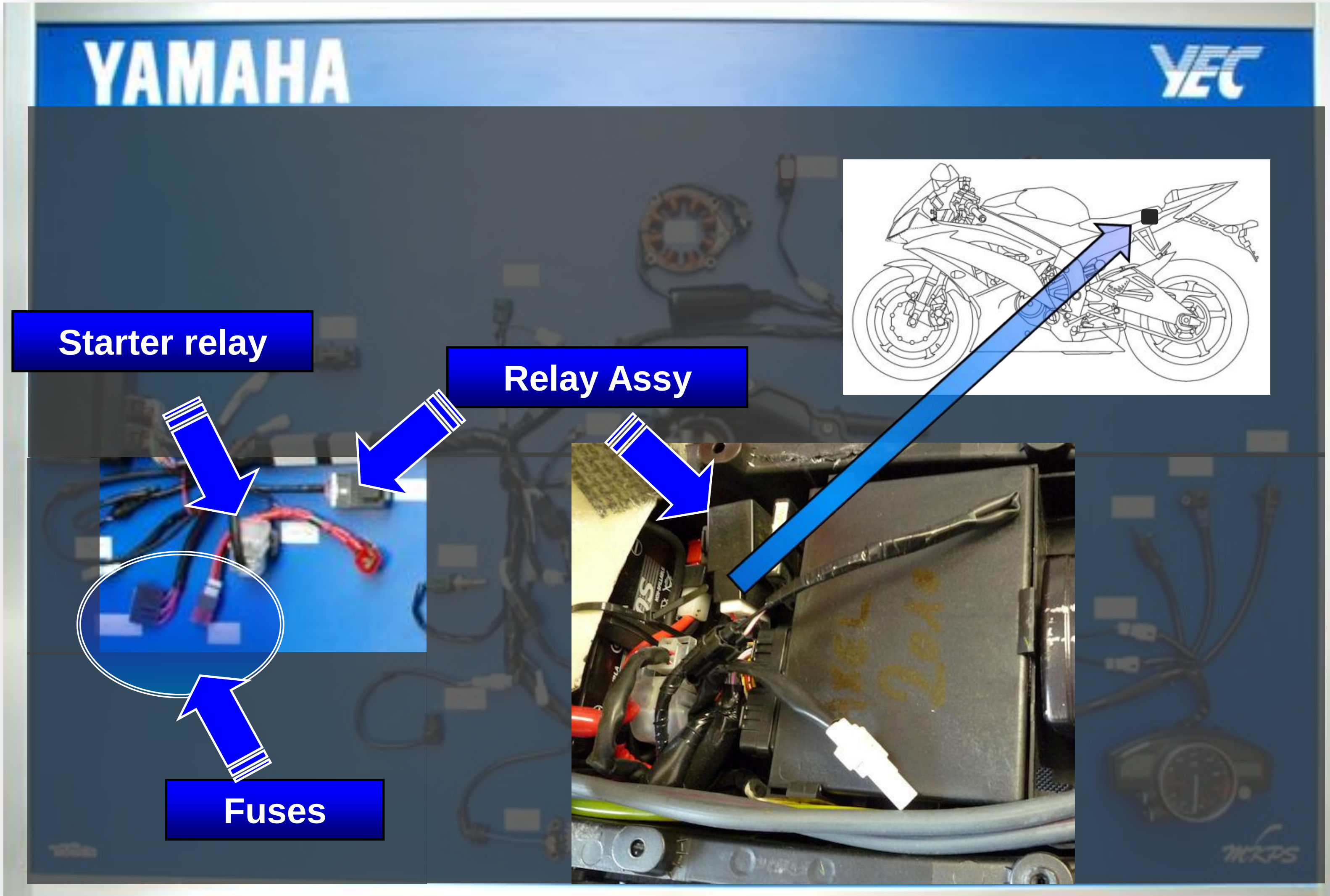
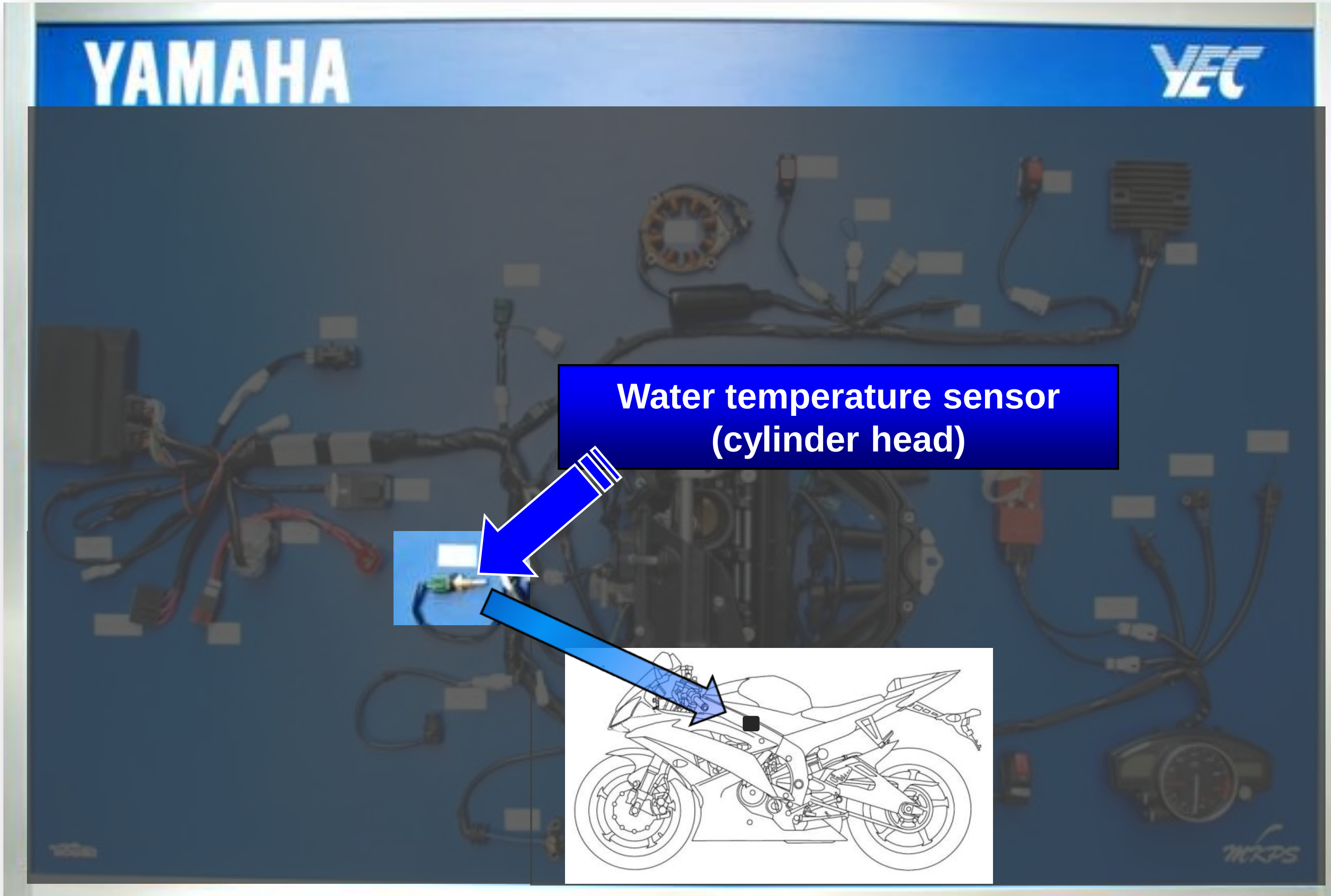
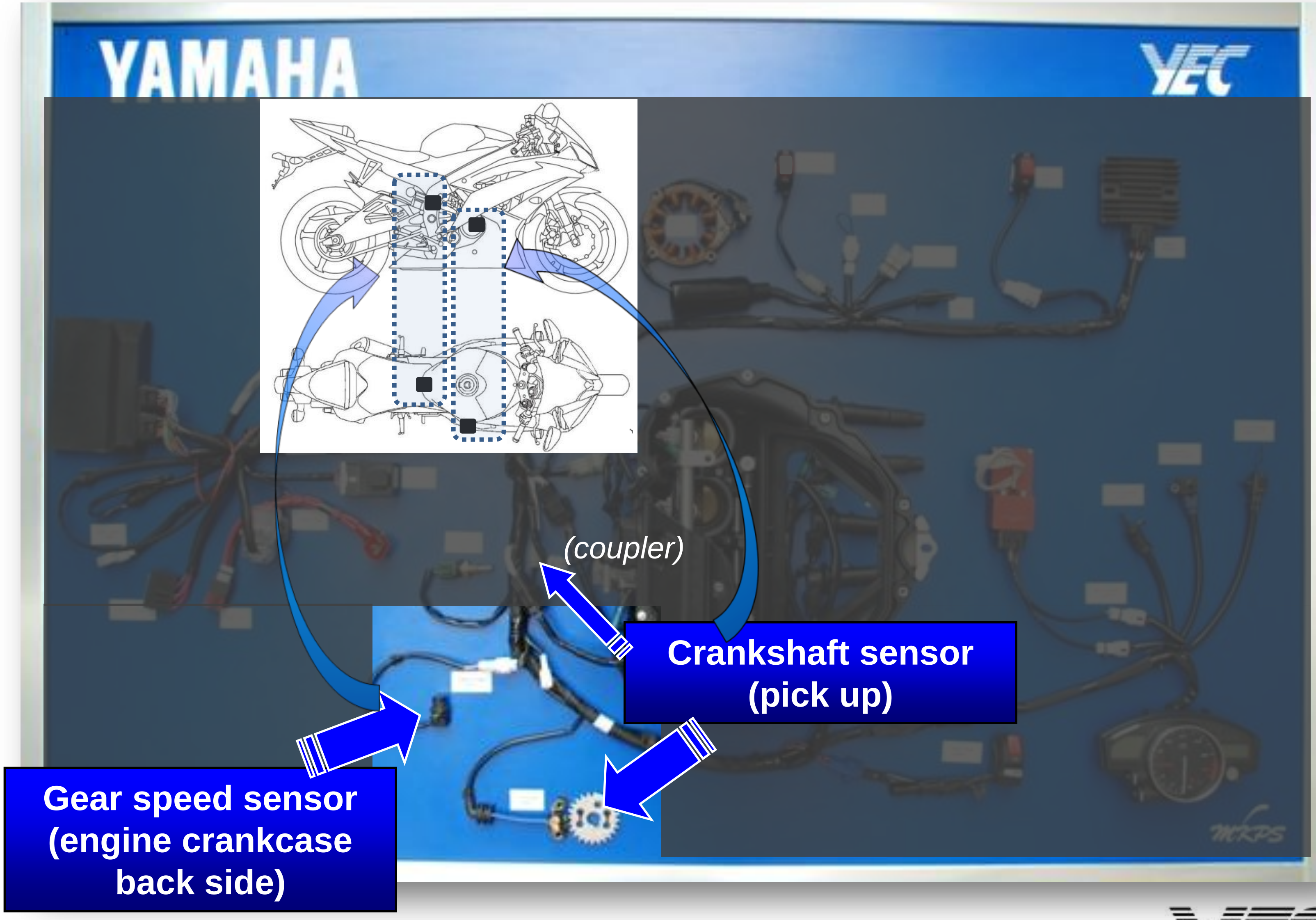
Motorcycle Kit Parts Support




YAMAHA
YEC
Water temperature sensor
(cylinder head)


YAMAHA
YEC
(coupler)
Crankshaft sensor
(pick up)
Gear speed sensor
(engine crankcase
back side)

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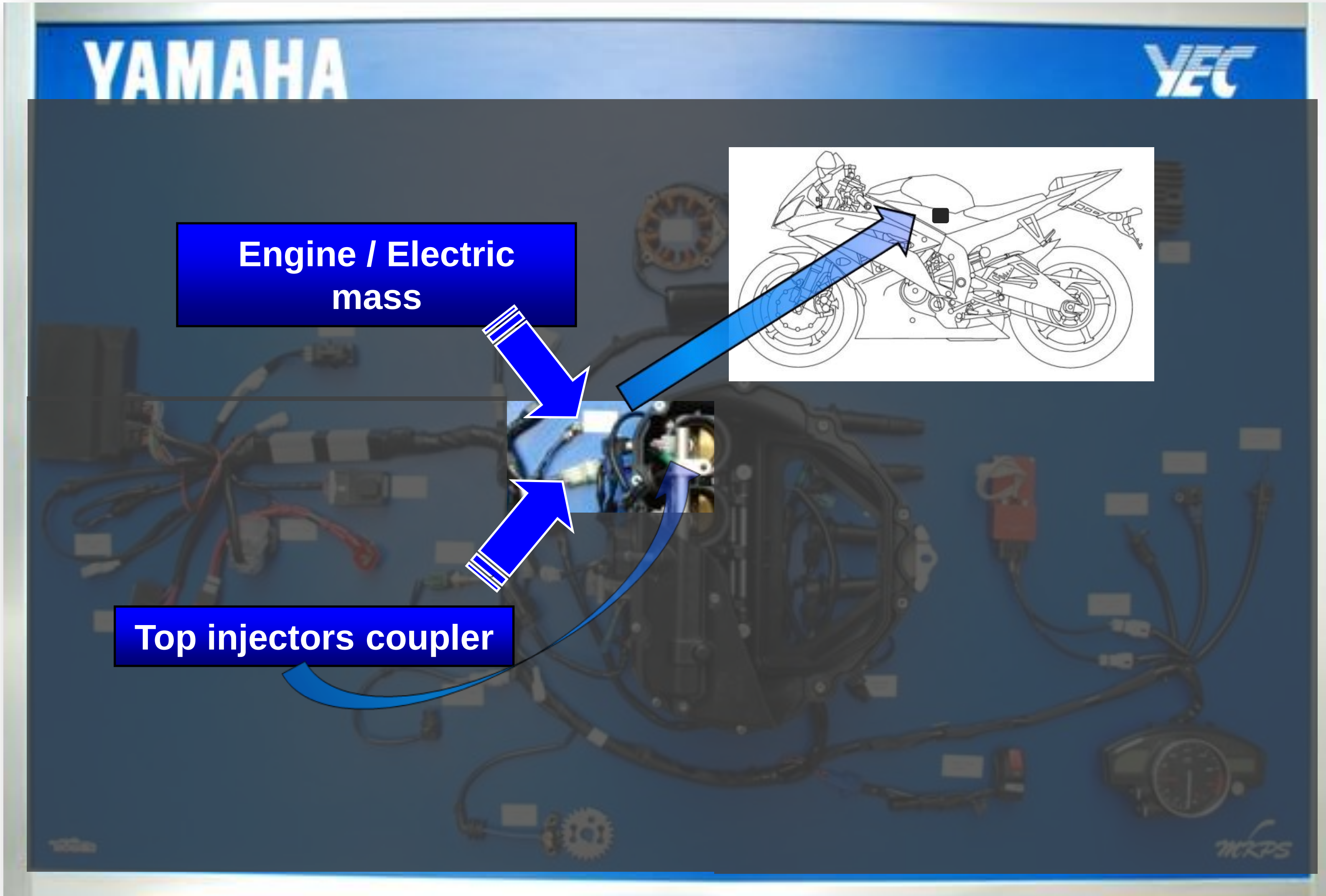

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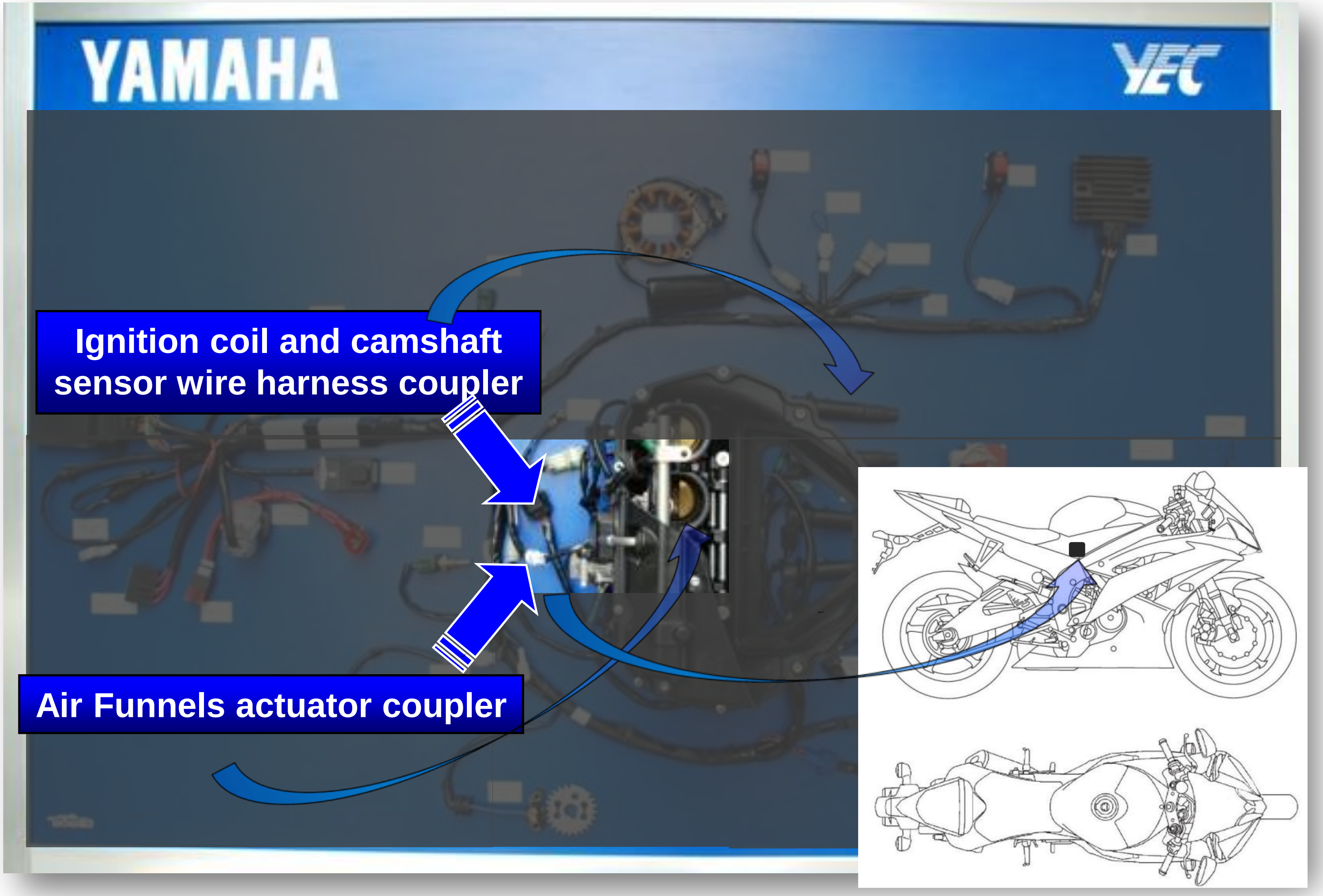

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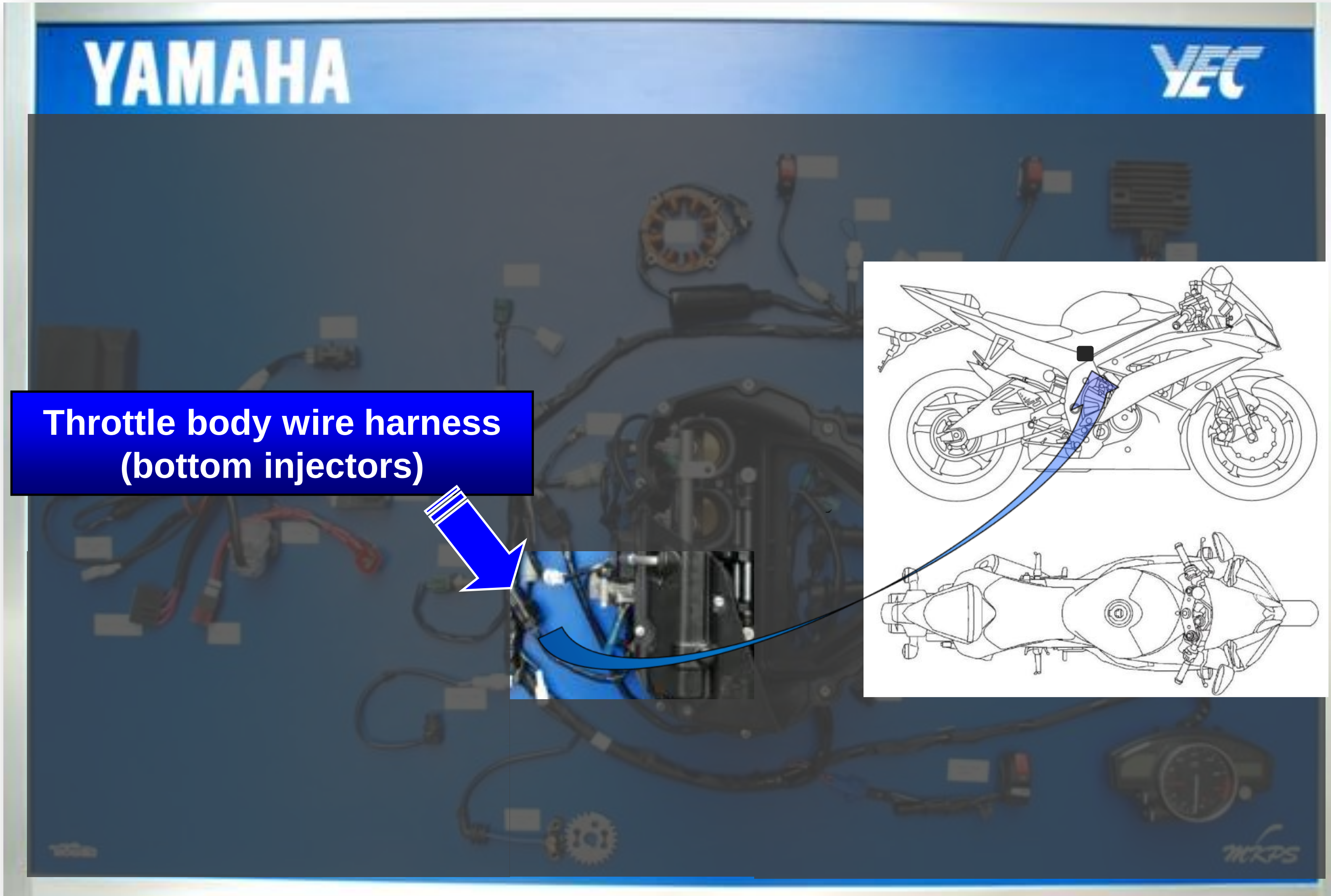
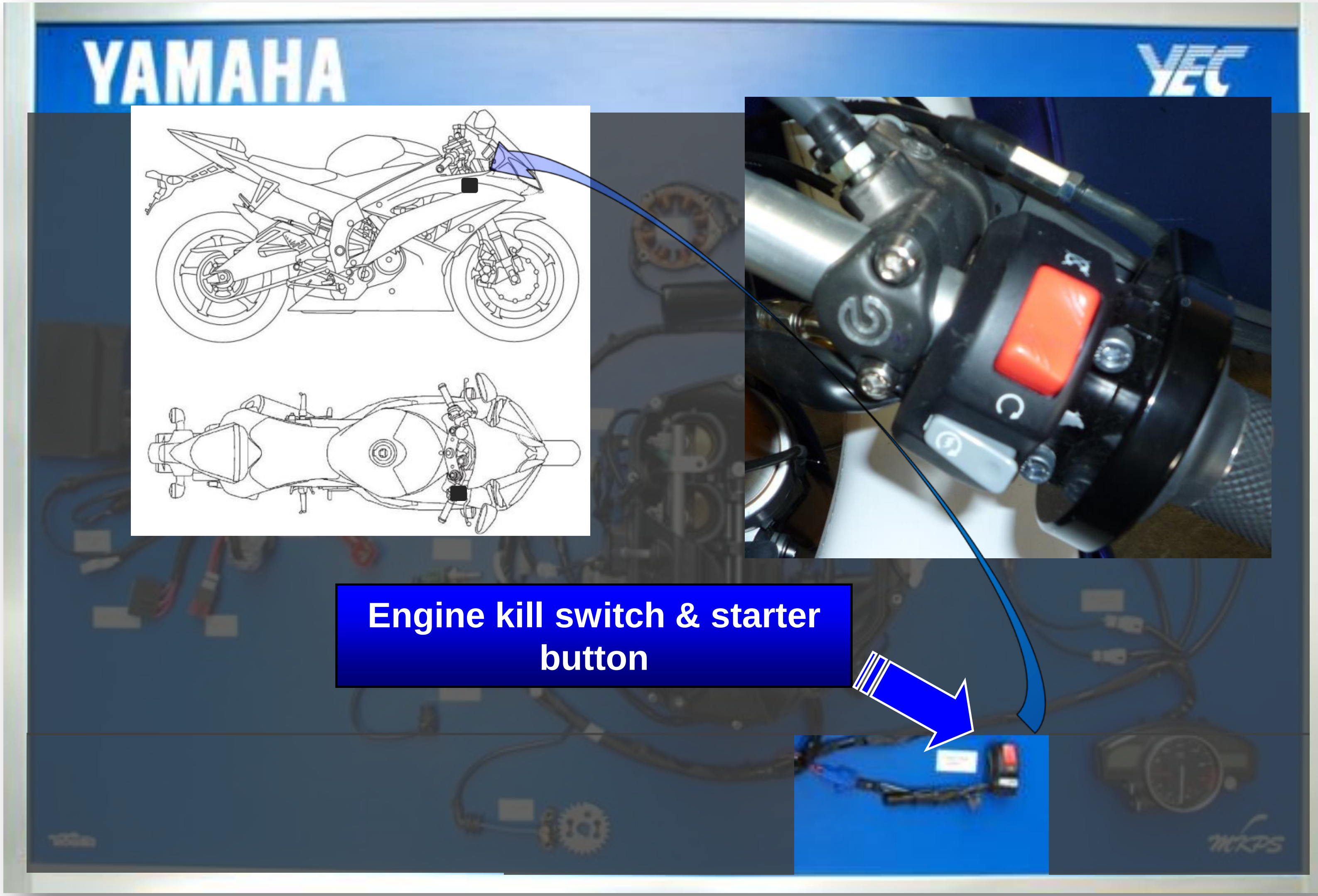


YEC
yamaha-racing parts.com


YAMAHA
Engine kill switch & starter button

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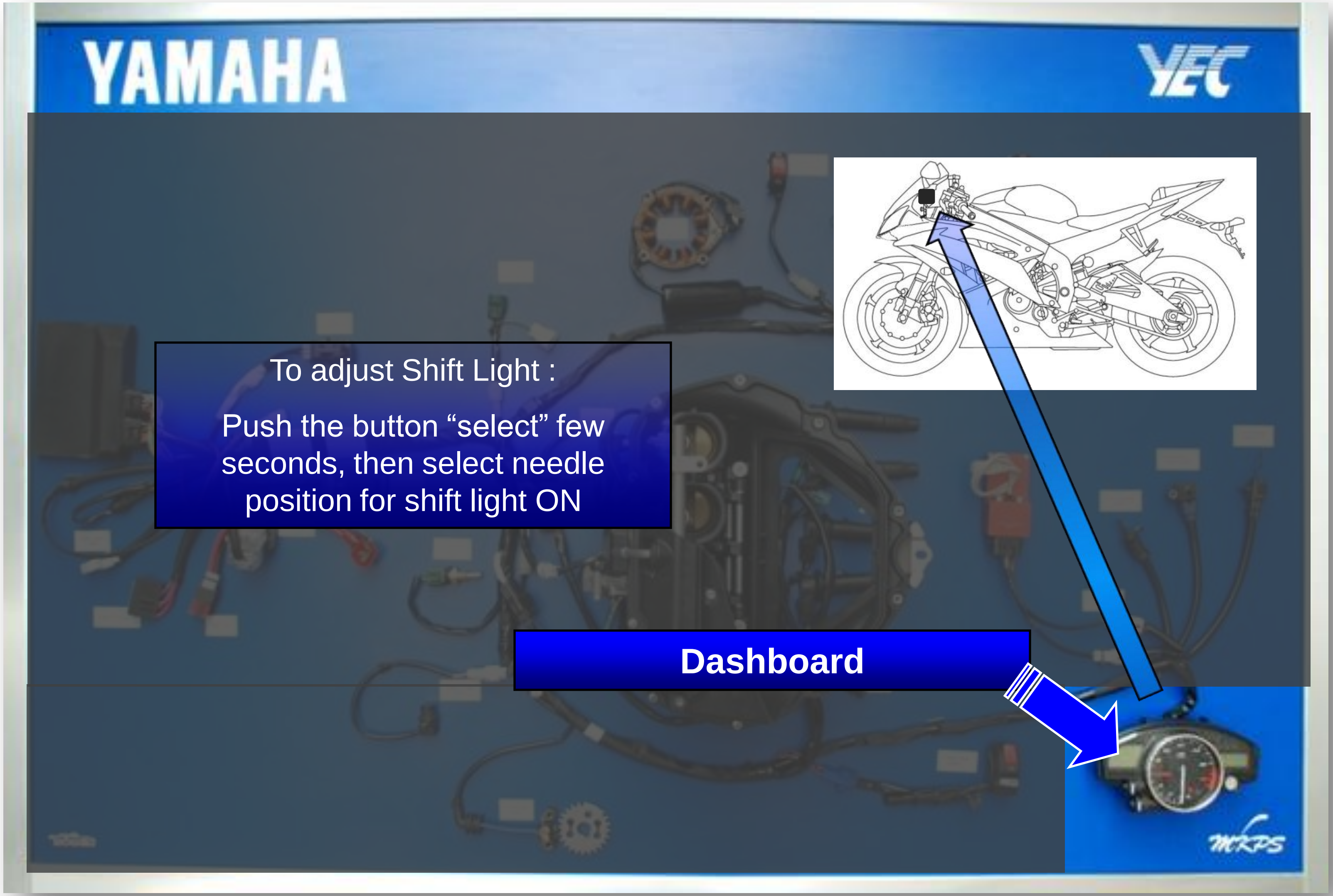
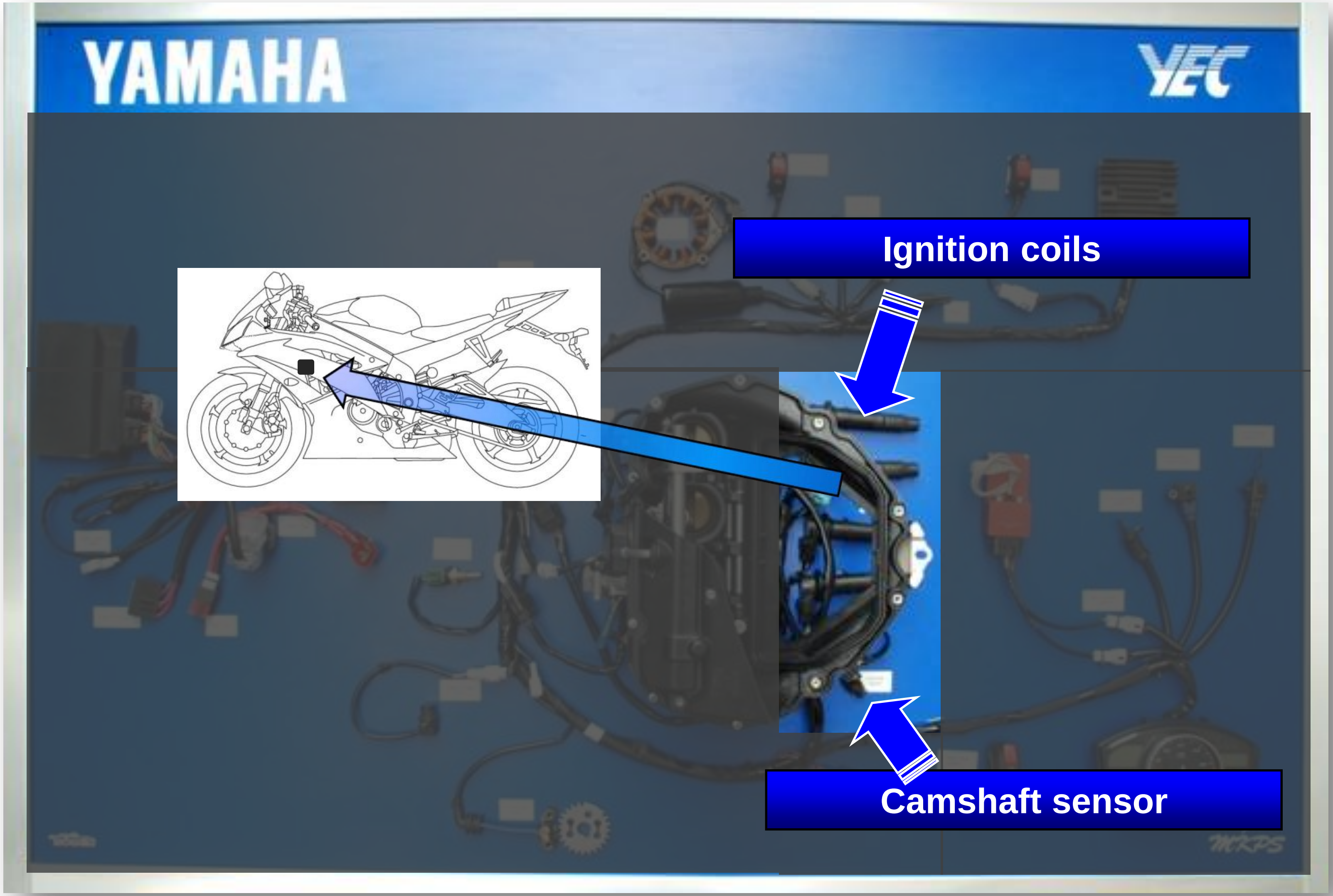
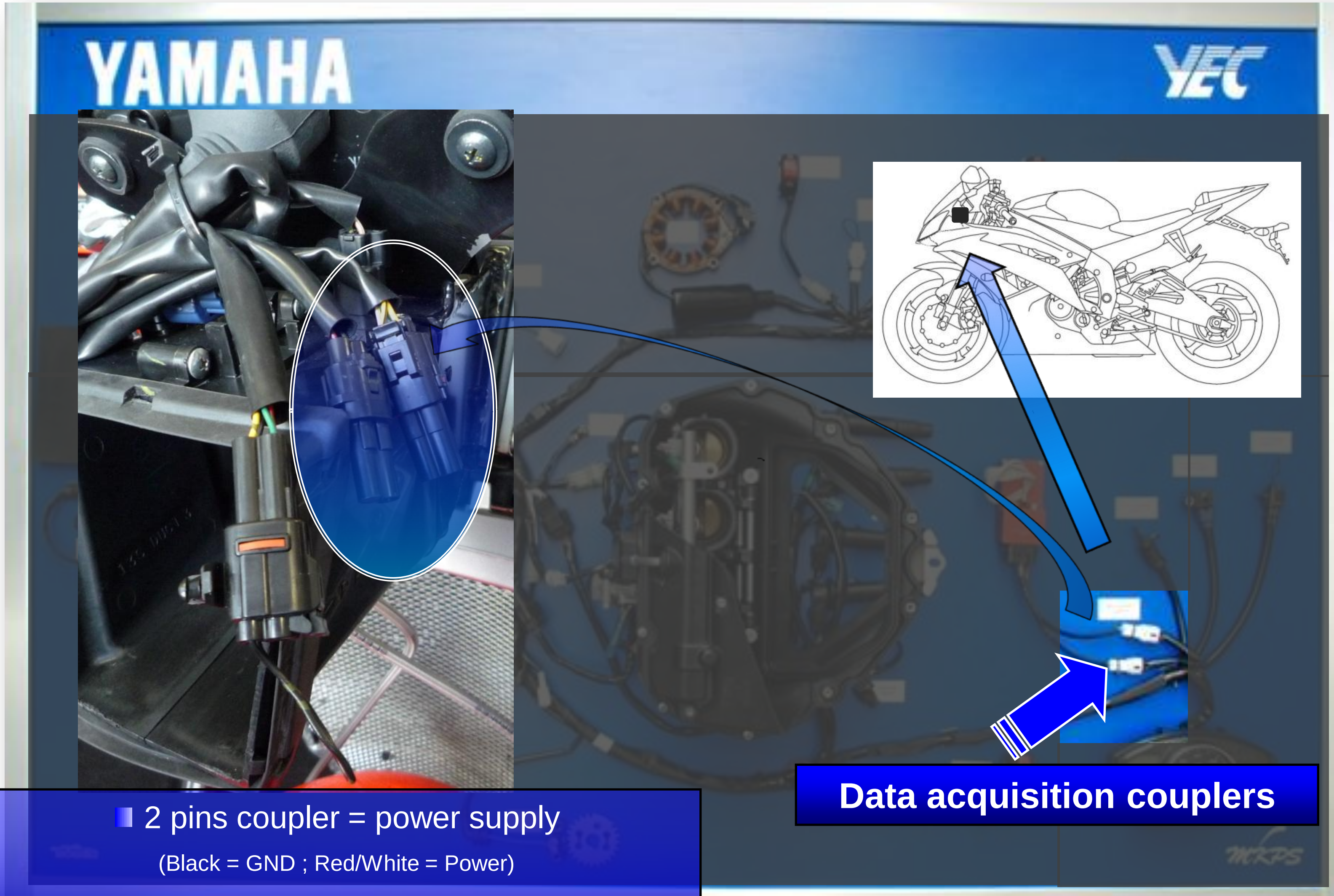


YEC
yamaha-racing parts.com


YAMAHA
YEC
Ignition coils
Camshaft sensor



Data acquisition couplers

- 2 pins coupler = power supply

  (Black = GND ; Red/White = Power)

- 4 pins coupler = signals

  (Green/White = Water temperature ; White/Yellow = Bike Speed ; Yellow = Throttle Position Sensor ; Yellow/Black = Engine revolution)

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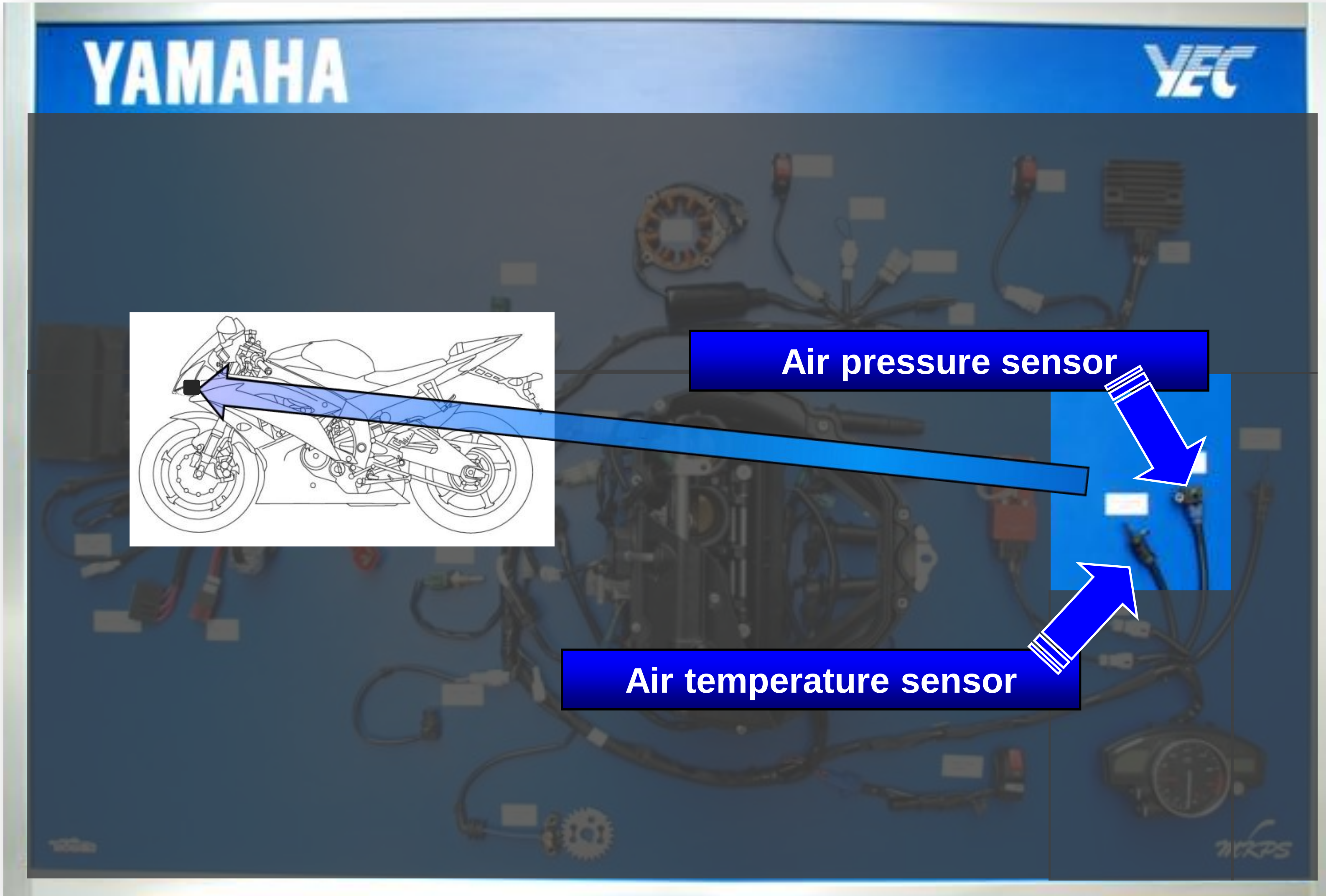
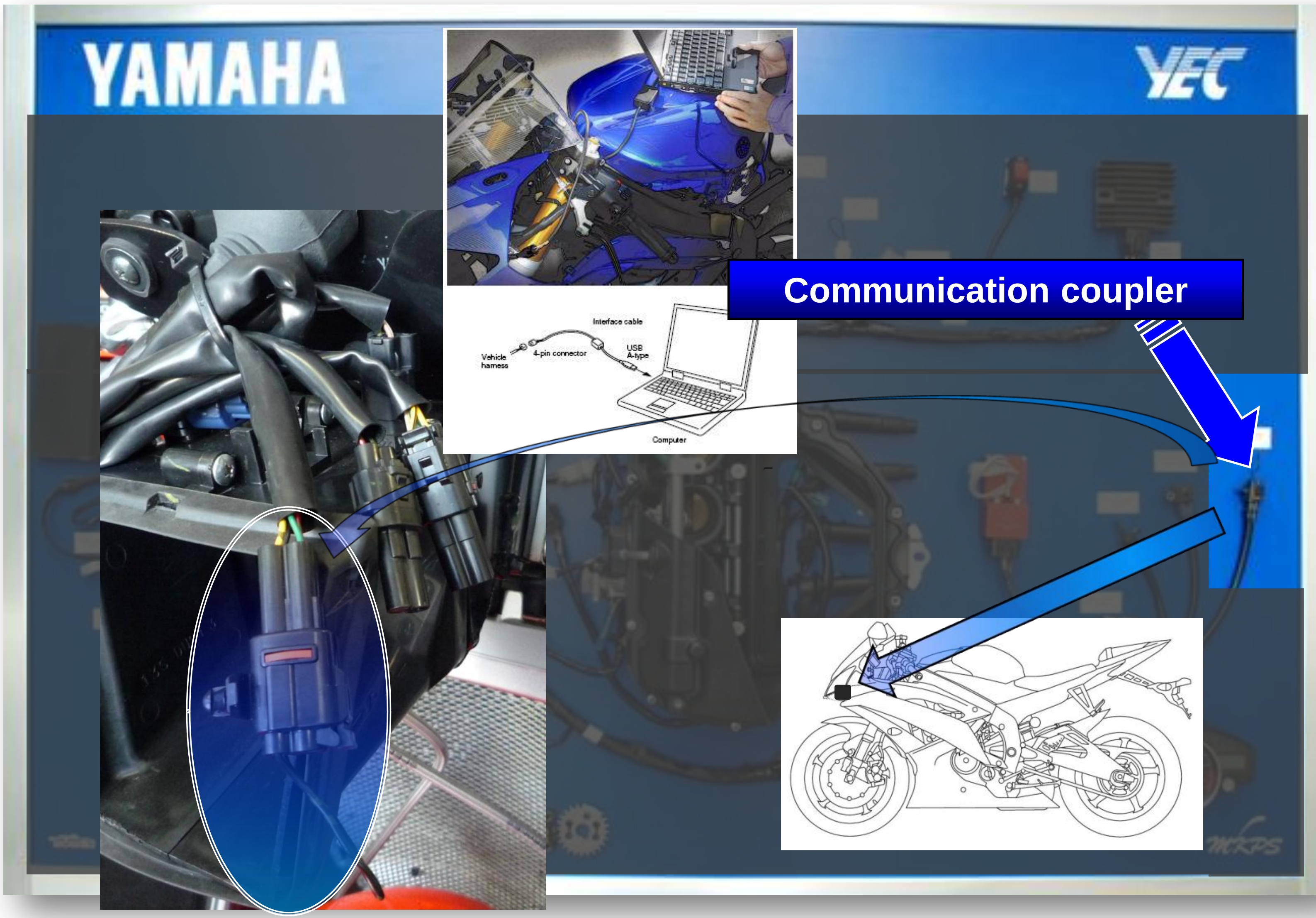


Motorcycle Kit Parts Support



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Wire Harness Reference Table

Year / Model	R6 ECU	R6 Wire Harness
2010	2C0-8591A-91	13S-F2590-71
2009	2C0-8591A-90	13S-F2590-71
2008	2C0-8591A-80	13S-F2590-70
2007	2C0-8591A-71	2CO-F2590-80
2006	2CO-F533A-70	2CO-F2590-70
2005	5SL-8591A-80	5SL-F2590-71
2003-2004	5SL-8591A-70	5SL-F2590-70

YEC
yamaha-racingparts.com

Next month,

Technical letter n°5 will tackle about YZF- R1 Racing Wire Harness.

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TECHNICAL
LETTER N°3

Subject:

YMS

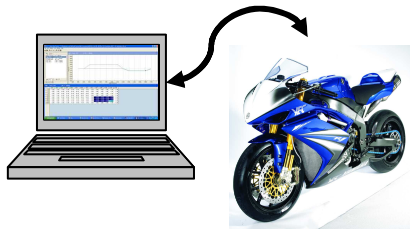
Yamaha Matching System

“Second approach : using YMS on track”

YEC
yamaha-racingparts.com

Introduction

This new edition of the Technical Letter brings methods in order to make a correct use of this software. *TL n°3* gives a practical use in real condition, on track with a data acquisition or on a dynamometer machines.

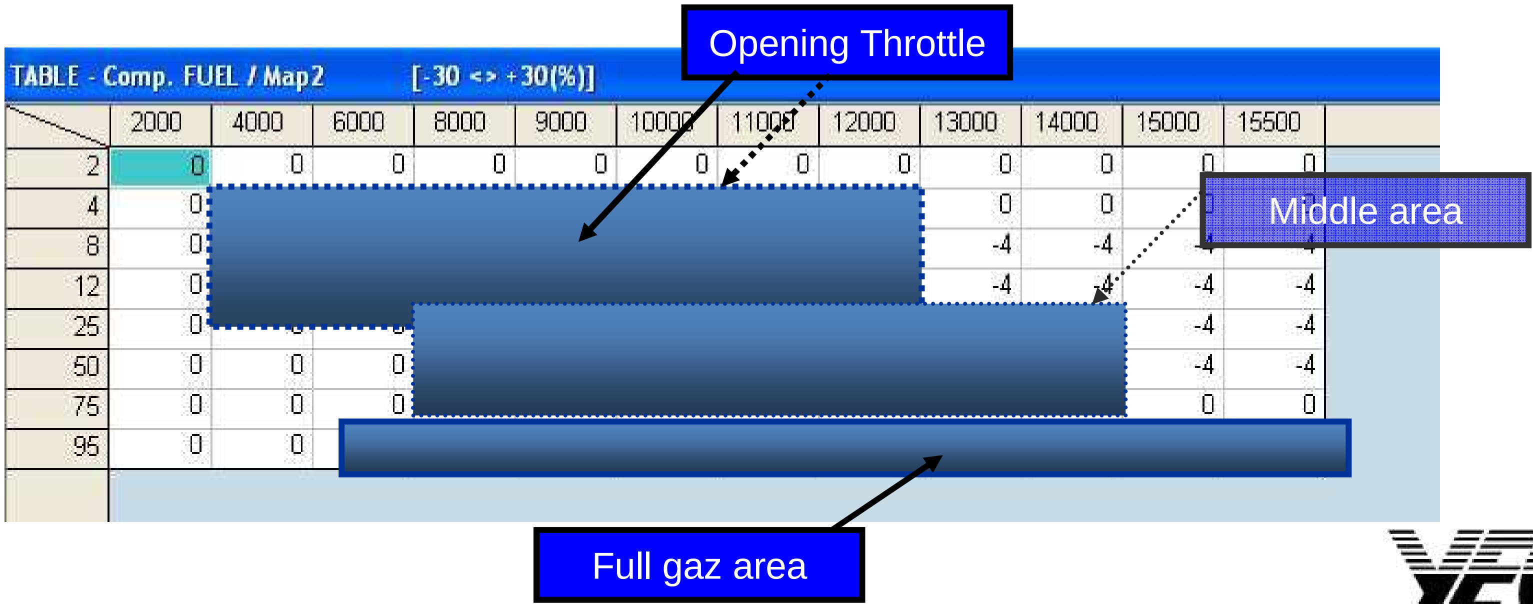


Summary

- Compensate fuel Map
- Offset Ignition
- ETV Control (Engine brake control)
- Pit road limiter

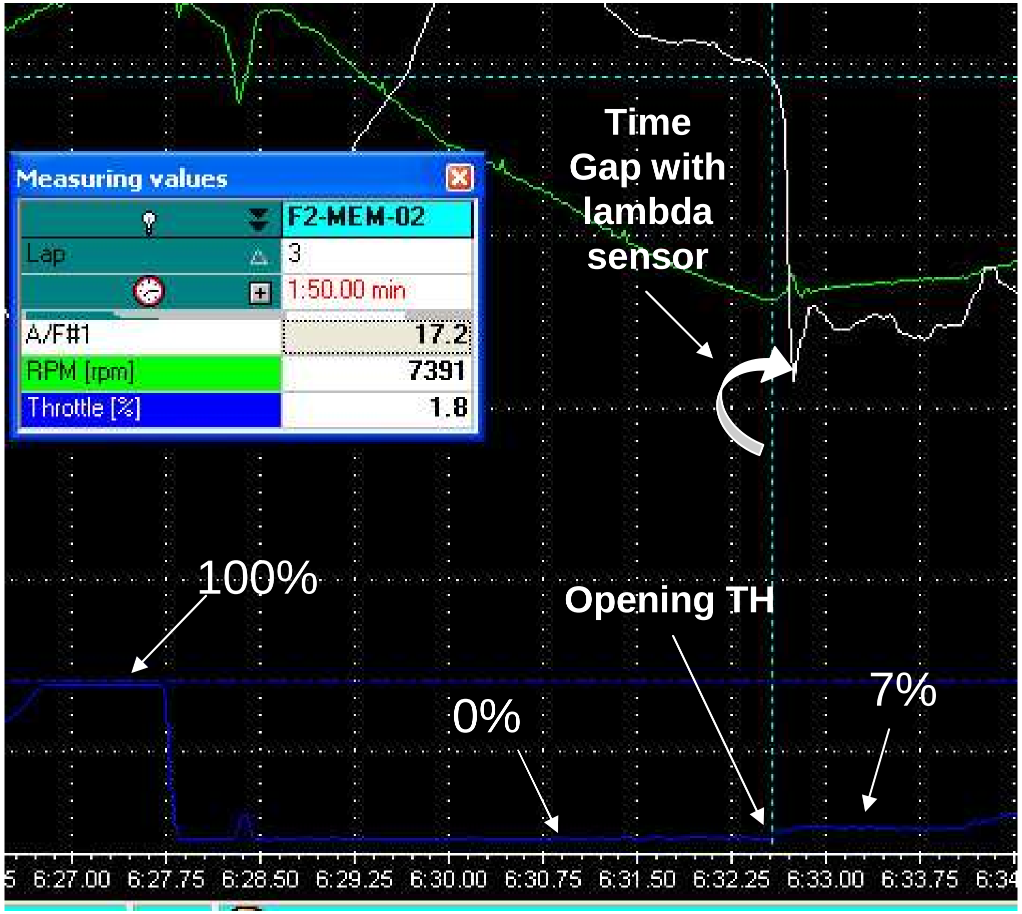
Compensate Fuel MAP

As mentioned in the previous Technical letter, “Compensate Fuel MAP” table should be adjusted in combination with a data acquisition. ***It is not possible to adjust correctly this parameter without this device***. There is two important points or areas where technicians have to focus on. The first one is the opening throttle area and the second one is the full opening throttle area. This first one determine the rider feeling on opening gaz. The second one fix the power delivery and engine life time. Middle area is less important as throttle cross quickly this area.



Compensate Fuel MAP : Identification area

The area mentioned on previous page are located on a data acquisition as mentioned here after.



Compensate Fuel MAP : Opening Throttle

Opening throttle is on every machines (R1 or R6) located around 10% (+ or – 4%). The most useful area is located on the dark rectangle on 4th page.

As described on data logging picture above, there is a ***time gap, or reaction time*** between throttle opening and lambda start measurement. This time depends of distance from cylinder head to lambda and also from sensor reaction itself. It may also depends of data acquisition system measurement frequency.

On Yamaha machine, we can evaluate this time gap around 0,2 seconds. When technician wants to adjust 0 to 2% of throttle, he should keep in mind this criteria.

On R6 machine, lambda value on opening area is not so critical as R1 motorbike. Usually, lambda target is :

R6	
R1	

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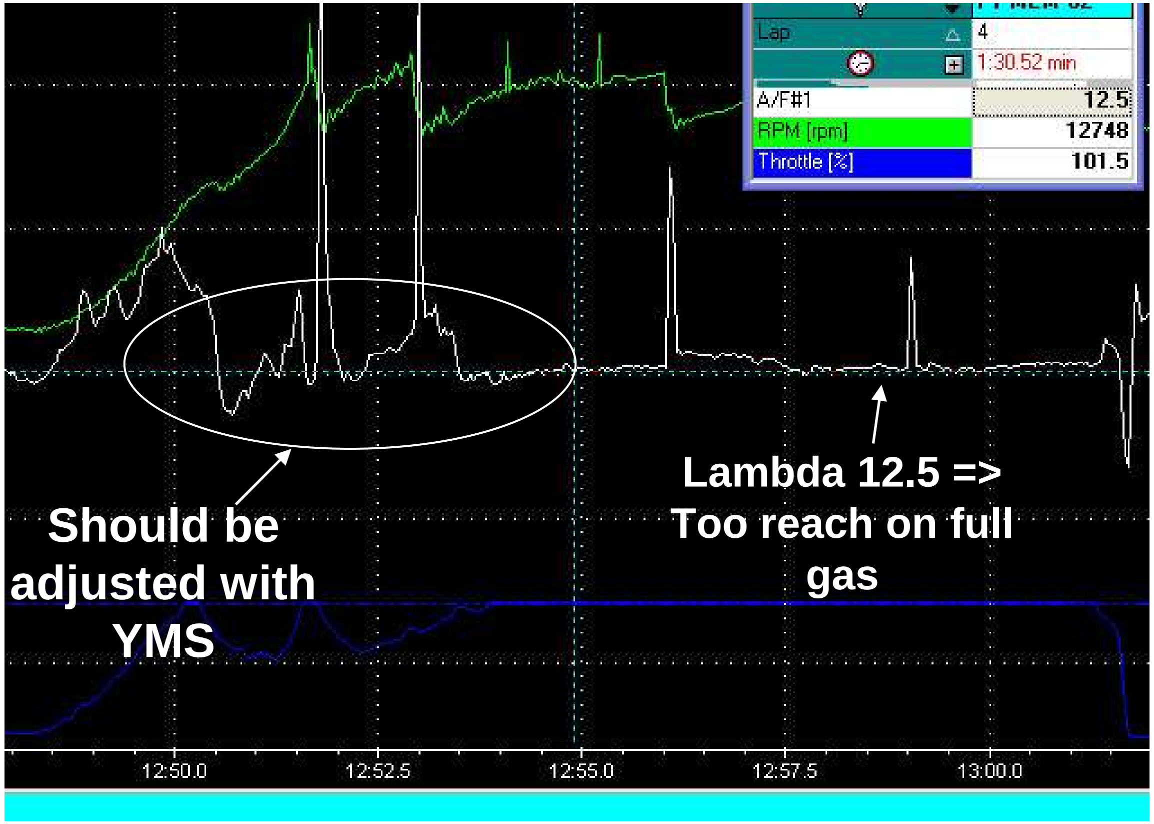
Compensate Fuel MAP : Opening Throttle

Opening throttle is an important parameter which determines when rider can open throttle in the corner. When engine reaction is brutal on opening throttle, rider as to wait a safe position on corner exit before opening gaz.
Moreover, this is a key point for the “throttle connection “ with tyre.

Practically, engine becomes aggressive when lambda going lean (over 12.8). Generally, on R1 bike, the engine should run reach (from 12 to 12,5). If engine coming aggressive, fuel mapping should be more reach.
R6 bike is less sensible to this parameter, meanwhile, keeping lambda value around 12.5 is a good compromise.

Compensate Fuel MAP : Full gas

Here below a sample of a lambda measurement on full gas area. Before any adjustment on YMS data, lambda measurement curve may be unstable as the sample below. In that case, lambda should be adjust leaner on 100% throttle and should be corrected when throttle reach 100%.



Compensate Fuel MAP : Full gas

Lambda value on Full gas area is an important criteria for engine power delivery.

- Excessively lean, there is a risk for engine life, engine knocking, engine overheat and engine power decreasing.
- Too reach, no particular risk for engine, meanwhile engine power can not express itself.
- Best engine power delivery around 13 / 13.3

Fuel consumption

It depends of track layout, meanwhile, fuel consumption is drastically influenced by lambda value on Full gas area. In case of fuel tank capacity too short for a race, fuel mapping should be adjusted in order to reach lambda leaner on full gaz area (13.3 with a maximum of 13.5).

R6 & R1

Compensate Fuel MAP : Full mapping adjustment

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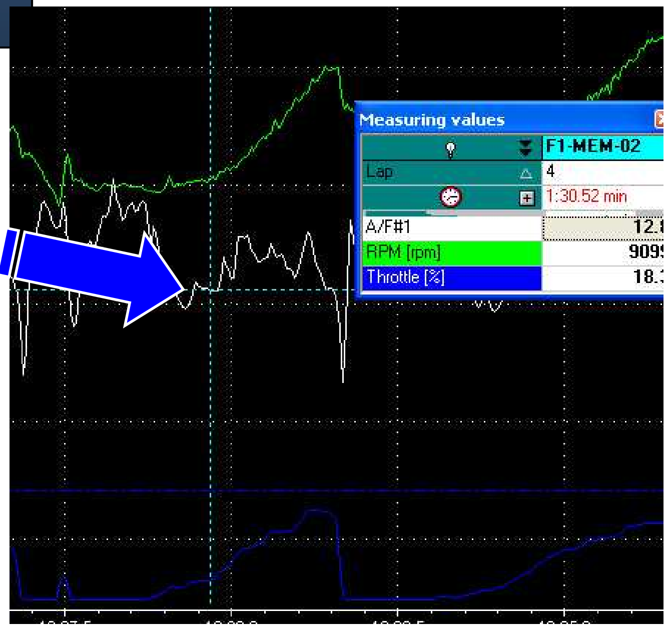
To adjust fuel mapping, there is a basic rule that works in 99% case:

+ 4 % fuel => lambda will reach + 0,4

BLE - Comp. FUEL / Map2 ... <> +30(%)

	2000	4000	[illegible]	8000	9000
2	0	0	0	0	
4	0	4	4	4	
8	0	4	4	4	
12	0	4	4	4	
25	0	0	0	0	
50	0	0	0	0	



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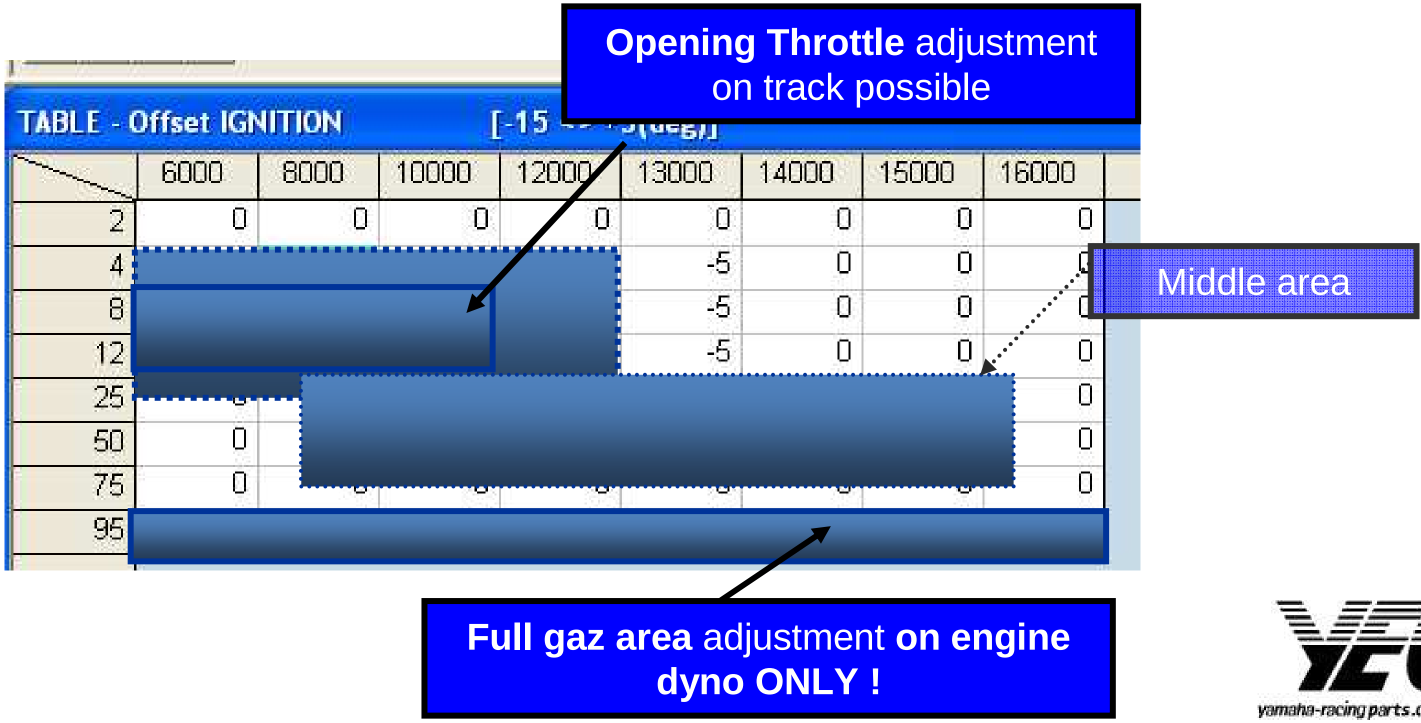
Offset Ignition : Generality

Offset Ignition is a parameter which allow to adjust ignition timing function of engine specifications.

Ignition base mapping is developed with YEC racing engineers. This mapping is fixed in order to give best power delivery to the engine. YMS offer the possibility a apply a correction "offset" of base mapping.

Ignition offset => affect directly engine power delivery.



Offset Ignition : Opening throttle and middle range

Engine character can be adjusted by ignition offset. As this parameter influence directly engine power delivery, this is a simple way to control engine power delivery on opening throttle (after correct adjustment of Fuel mapping).
When engine is too much aggressive on opening throttle, a reduction of 5 to 15 degrees of ignition advance will help rider. Engine character become smoother as offset increasing on negative side. In opposition, engine character will be aggressive with positive offset on opening throttle area.

Middle range area may be corrected on track if necessary. It may reduce power or brings an additional torque.

Offset Ignition : Full gas, power delivery

As mentioned before, Ignition base MAP is achieved to brings best engine power delivery in any conditions (R6STK / R6 SS / R1 STK / R1SBK).

This important parameter may influence significatively engine life. Function of an important number of parameters such as : air temperature, atmospheric pressure, engine temperature, engine compression ratio, fuel quality (octane), a phenomenon which is hazardous to control may occurs : knocking or detonation.

It is the reason why we recommend to work on this area with the higher precaution. The best way is to test ignition timing on an engine dynamometer with appropriate tools.

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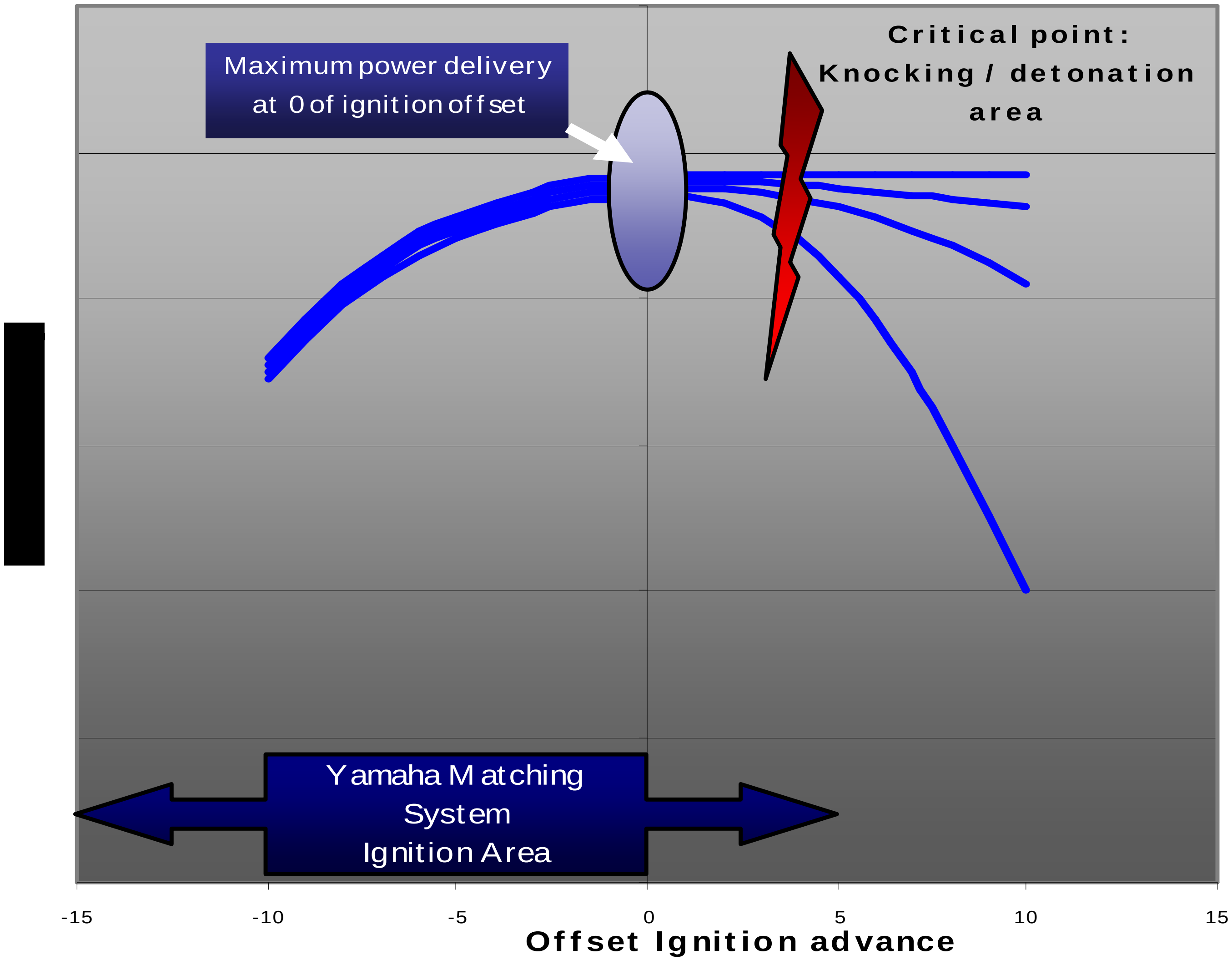
Offset Ignition : Full gas, power delivery

The graph below shows four typical evolutions of power delivery with a variation of ignition advance (or ignition offset). Ignition offset = 0 coincide with maximum power delivery. While ignition offset increasing, power delivery does not increase or decrease before a limit area called detonation.



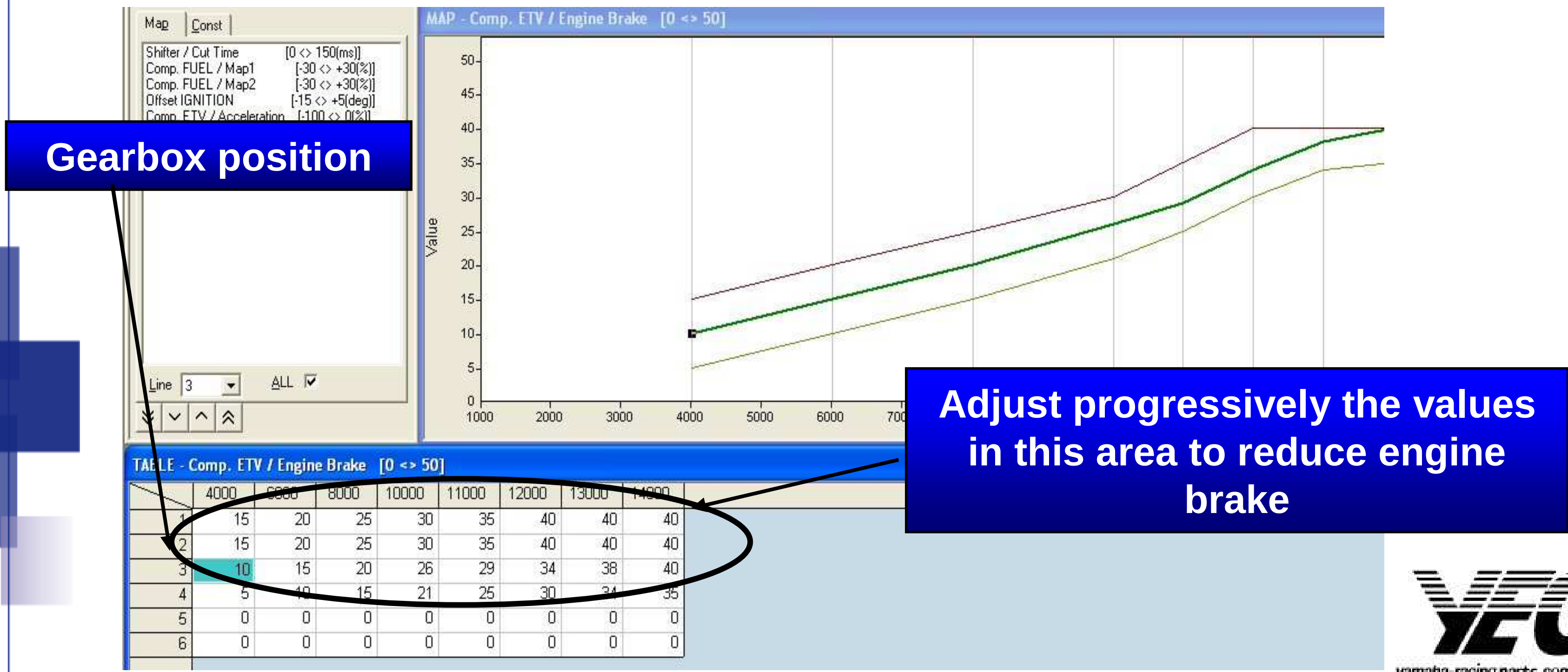
TL n°3

ETV / Engine Brake Control : Generality

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

This function is easy and simple to adjust through Comp. ETV table. Kit ECU is delivered with an offset of 0 (same as production machine). To reduce engine brake, the value in this table should be increased.

In order to adjust “safely” this parameter, it is necessary to reduce progressively the engine brake. Moreover, the “compensate ETV” curve should be smooth and progressive through engine revolution and the gears. A serrated curve may disturb the rider and cause riding mistake.



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ETV / Engine Brake Control : Setting

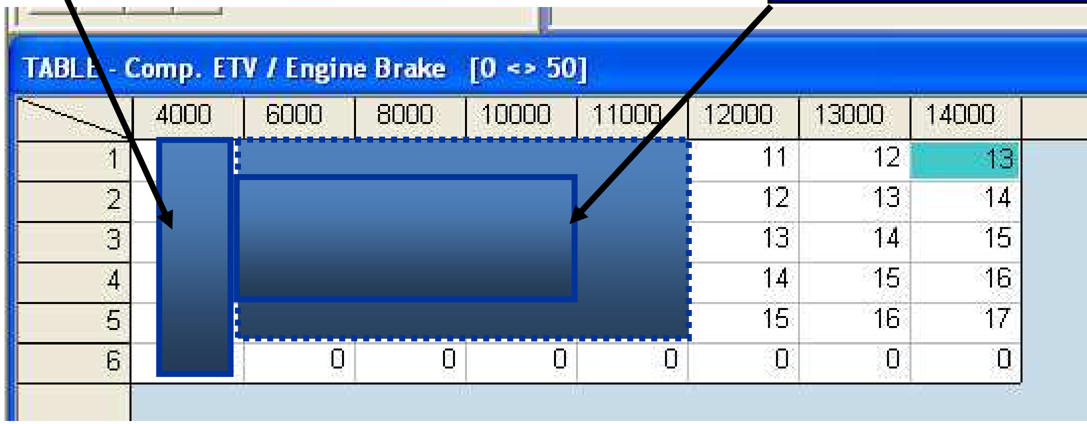
Engine brake may disturb rider specially from 4 to 2nd and 1st gears. Usually, from 6 to 5th, engine revolution is still too high and does affect riding. The pick of engine brake occurs and is gradually increasing from 4th to 3rd and 2nd.

In consequence, it is necessary to focus on this area as describe here after.

Moreover, to avoid high engine idle when the bike is static, it is recommended to keep Zero in the first column.

Keep "0" in order to have a standard idle revolution in static condition

Most important area for Engine Brake



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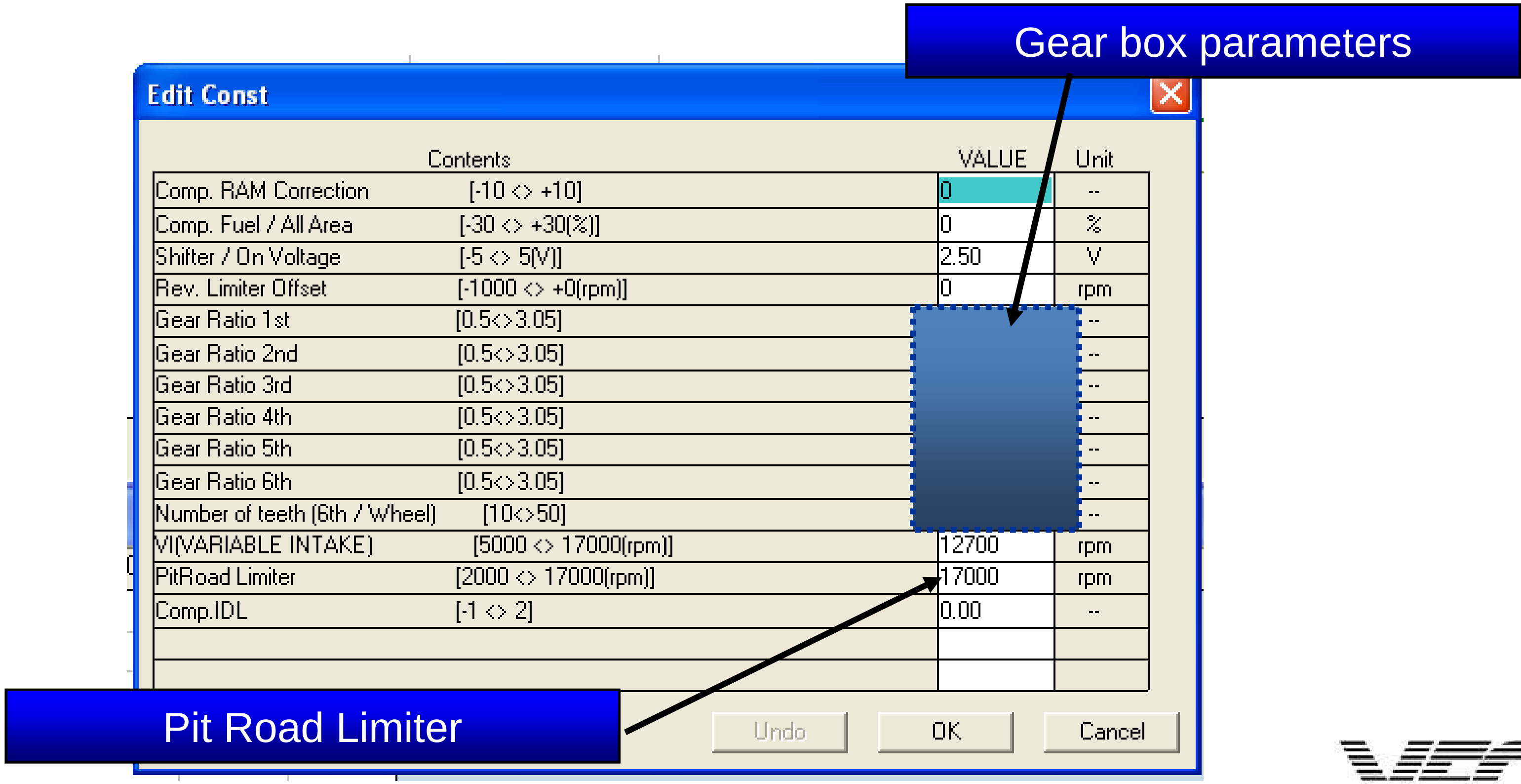
TL n°3

Constant Parameters table : Pit Road Limiter

The most important parameter on “Edit Const Table” is Pit Road Limiter. For safety reason, every tracks and championships fix a speed limit speed on pit lane.

Before fitting Pit Road limiter, it is necessary to complete Gear Ratio parameters. This is really important to get the correct speed limit after calculation.

Once gear parameter is complete, it is necessary to calculate the Speed Limit.



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TL n°3

Pit Road Limiter : Calculation

To calculate bike speed and more specially the engine revolution for the "Pit Road Limiter" parameter, a calculation table is proposed. The picture below is showing a presentation of this tool.

This tool is attached to this *TLn°3.*

Pit road limiter is only effective on 1st and 2nd gears. Depending of your secondary reduction ratio, the bike should be run on 1st or 2nd to adapt engine revolution to the situation.

Calculation

Target Speed (km/h)	
70	

Primary reduction ratio	
1,512	

Secondary reduction ratio	
Front Sproket	Rear Sproket
15	40

Tyre Perimeter (mm)	
2350	

First or Second gear ratio	
2,53	

Pit Road limiter (rpm)	
5064	

Data Base

	R1 (2009)	R6 (2009)
Primary Ratio	1,512	2,073

R1 (2009)	Std	A	B	C
1st	2,53	2,43	2,36	2,31
2nd	2,06	2,13	2	1,94

R6 (2010)	Std	A	B	C
1st	2,583	2,313	2,471	2,583
2nd	2	1,857	1,95	2

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Motorcycle Kit Parts Support

Next month,

Technical letter n°4 will tackle about Racing Wire Harness.

Motorcycle Kit Parts Support

TECHNICAL LETTER N°2

Subject:

YMS

Yamaha Matching System

"First approach : functions presentation"

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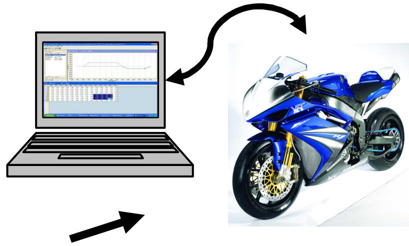
Introduction

YEC Kit ECU presented on the Technical Letter n°1 is 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.

TL n°2



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

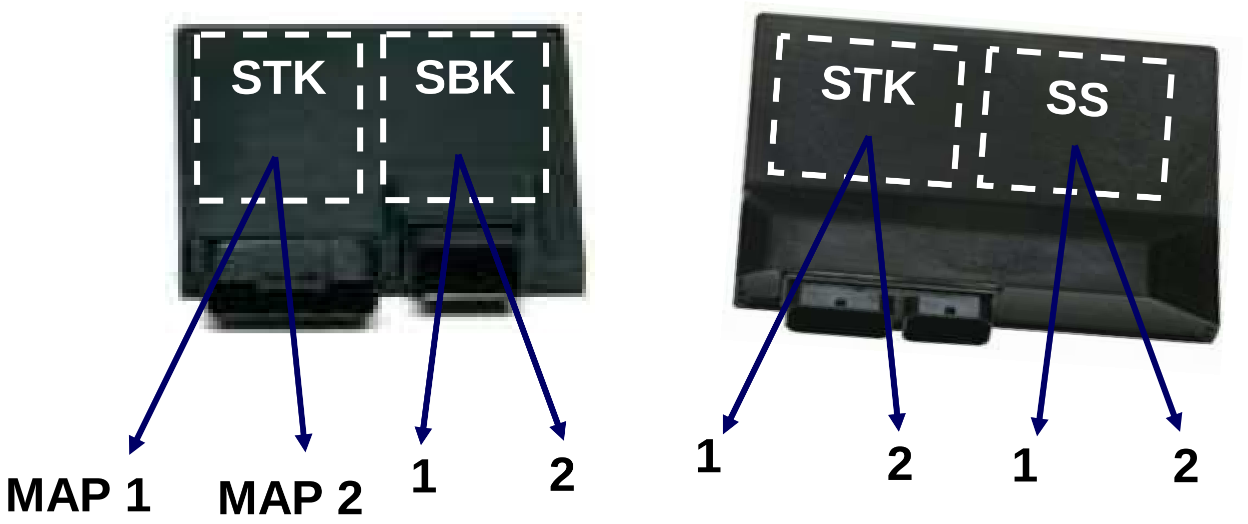
Those functions allow to correct the internal ECU data. The internal ECU mapping is fixed by YEC, meanwhile Yamaha Matching System offer the possibility to apply an offset to the base data. By this way, it become easy and possible to combine perfectly ECU with bike specifications.

Motorcycle Kit Parts Support

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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TL n°2

Select MAP coupler

- STK MAP
  - MAP 1
  - MAP 2
- SS or SBK MAP
  - 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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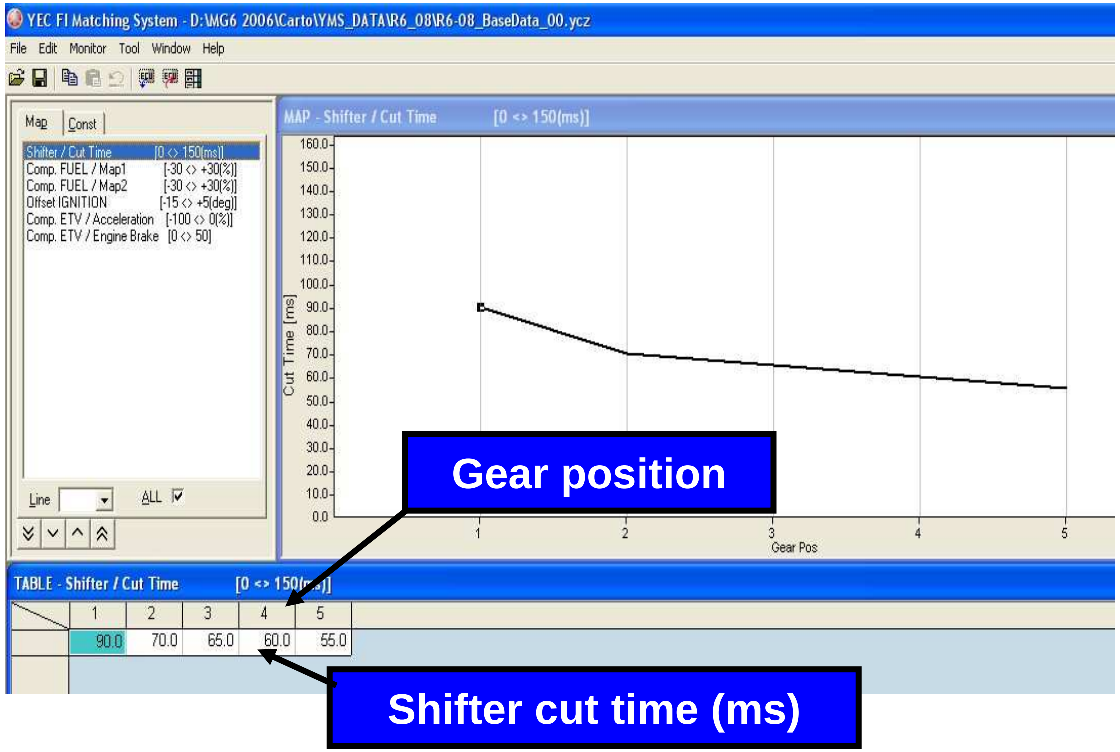
Summary

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

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.



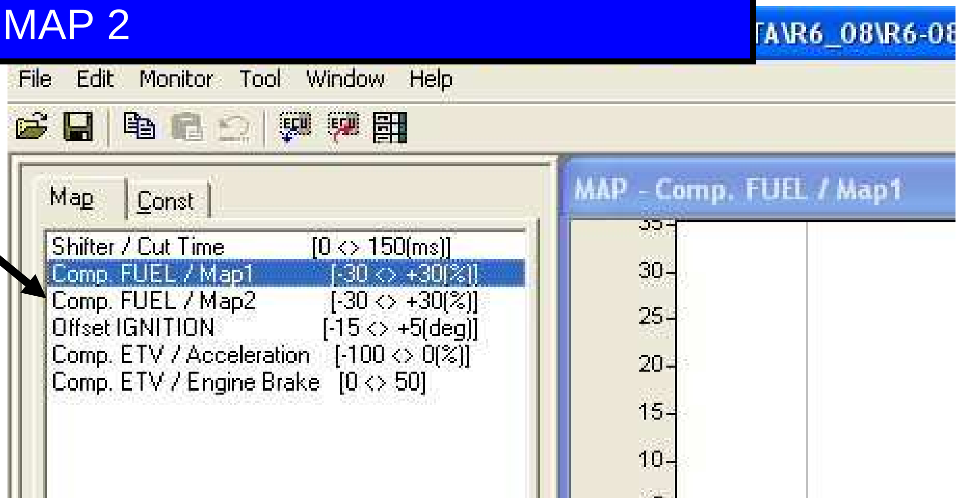
Fuel Map 1 & 2

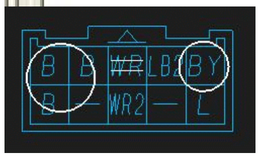
Kit wire harness offers the possibility to use either standard Dimmer switch or dedicated switch to select the MAP.

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

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.

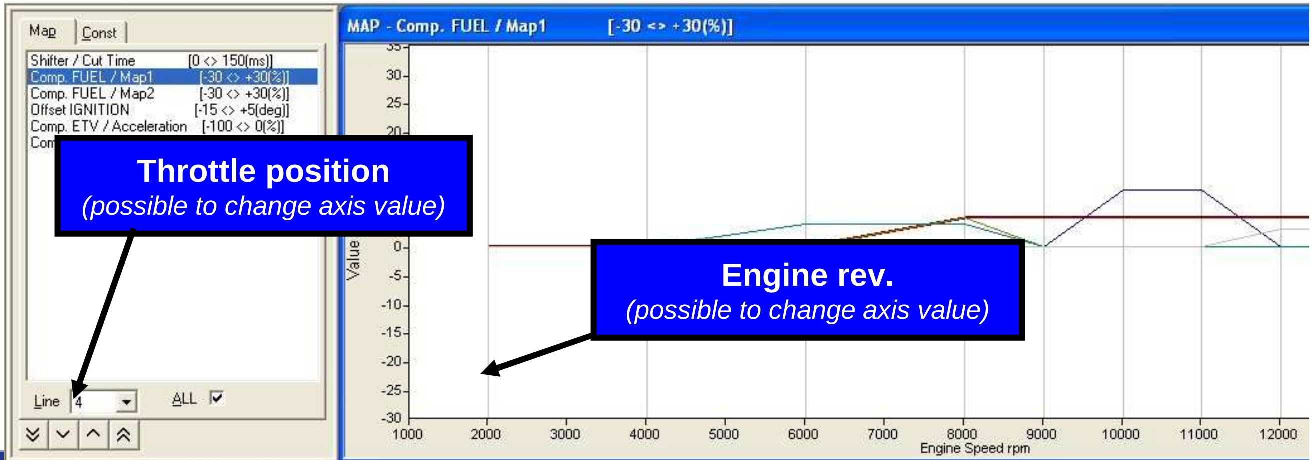


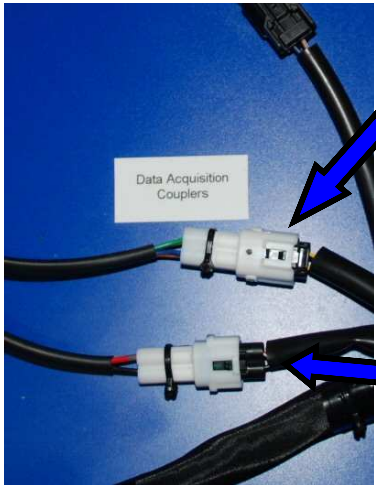
TABLE - Comp. FUEL / Map1 [-30 <> +30(%)]

	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

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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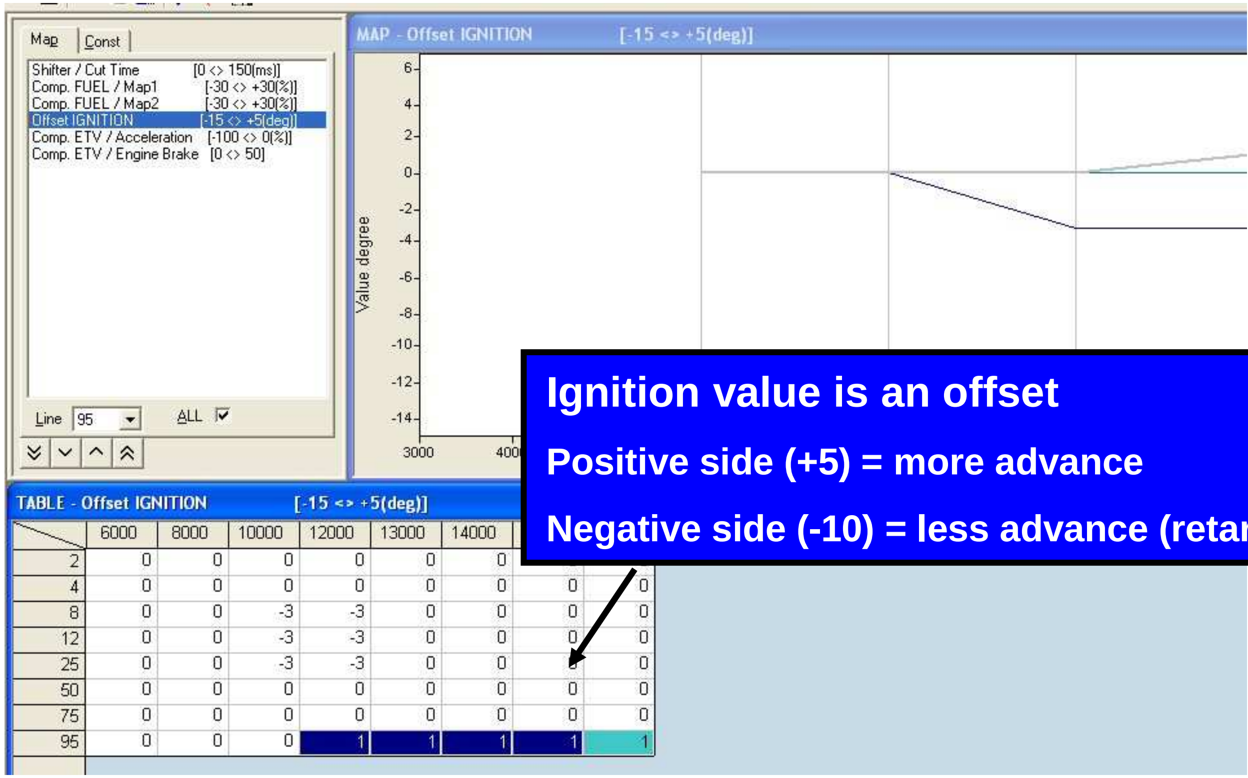
Ignition Map 1 & 2

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



Ignition value is an offset

Positive side (+5) = more advance

Negative side (-10) = less advance (retard)

YEC
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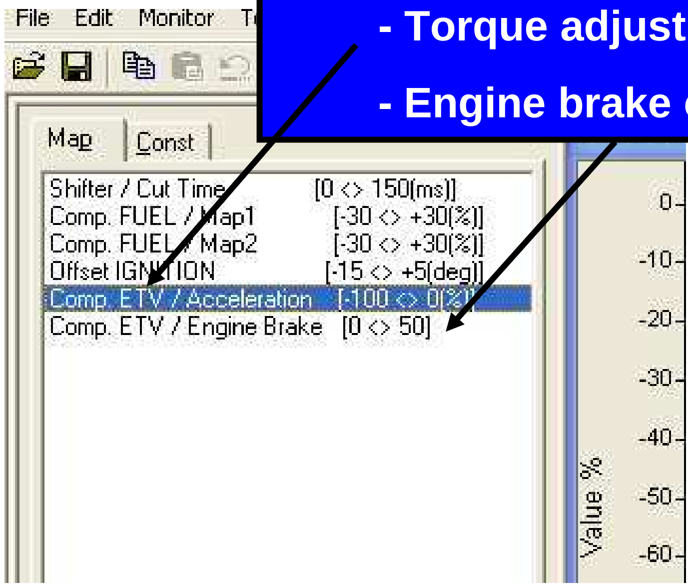
ETV (Electric Throttle Valve) Control

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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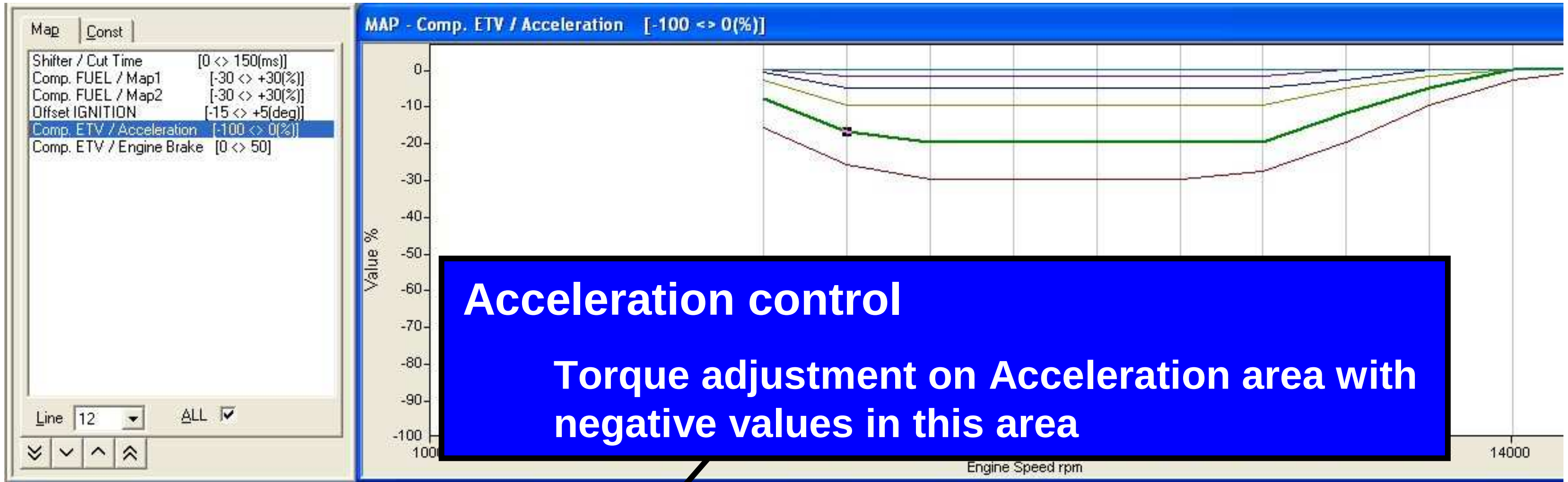
ETV / Acceleration control

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.



Acceleration control

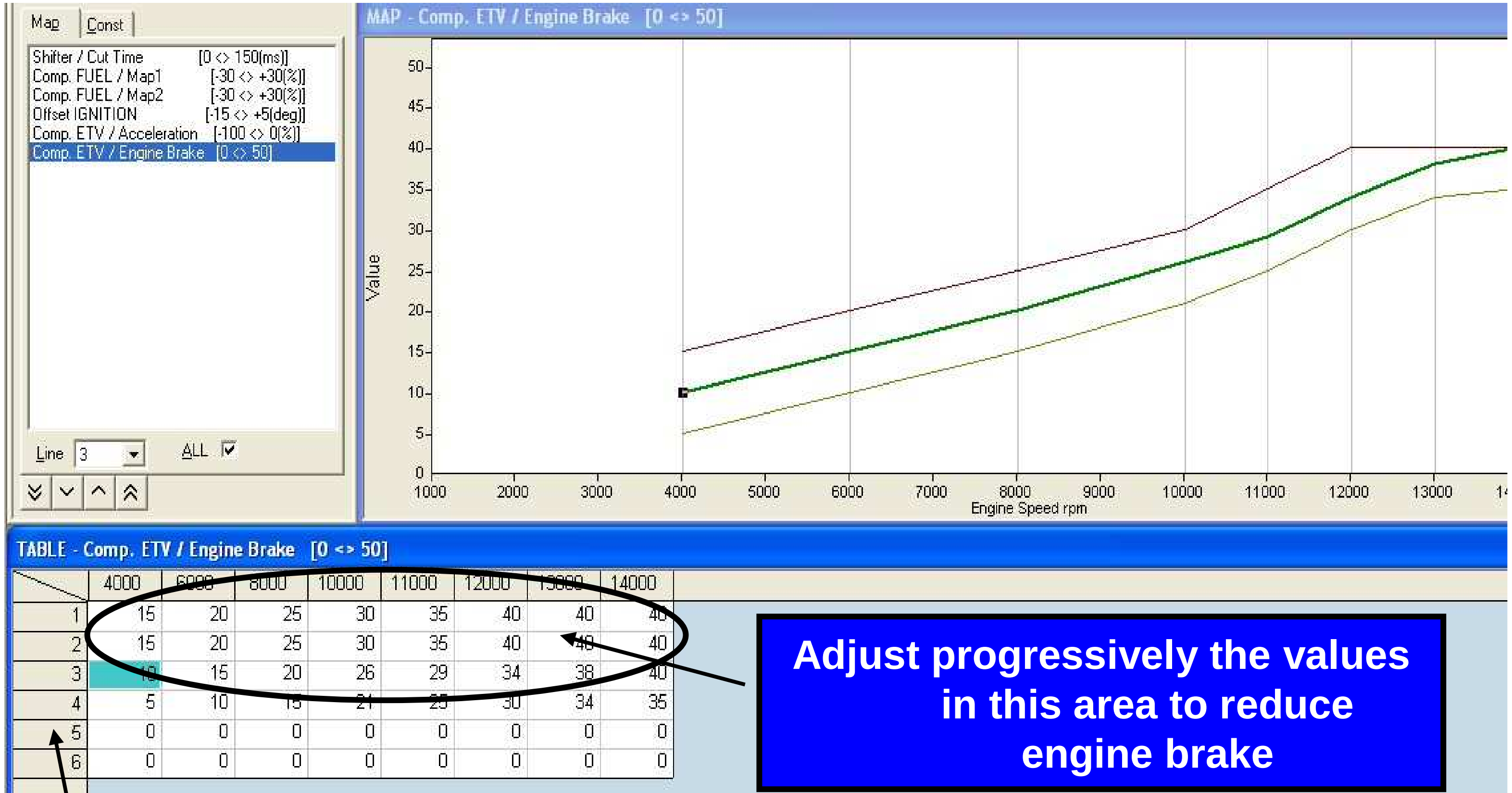
Torque adjustment on Acceleration area with negative values in this area

TABLE - Comp. ETV / Acceleration [-100 <> 0(%)]

	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	-16	-26	-30	-30	-30	-30	-28	-20	-10	-3	0	0
12	-8	-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

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.



	4000	6000	8000	10000	11000	12000	13000	14000
1	15	20	25	30	35	40	40	40
2	15	20	25	30	35	40	40	40
3	10	15	20	26	29	34	38	40
4	5	10	15	21	25	30	34	35
5	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0

Adjust progressively the values in this area to reduce engine brake

Gearbox position

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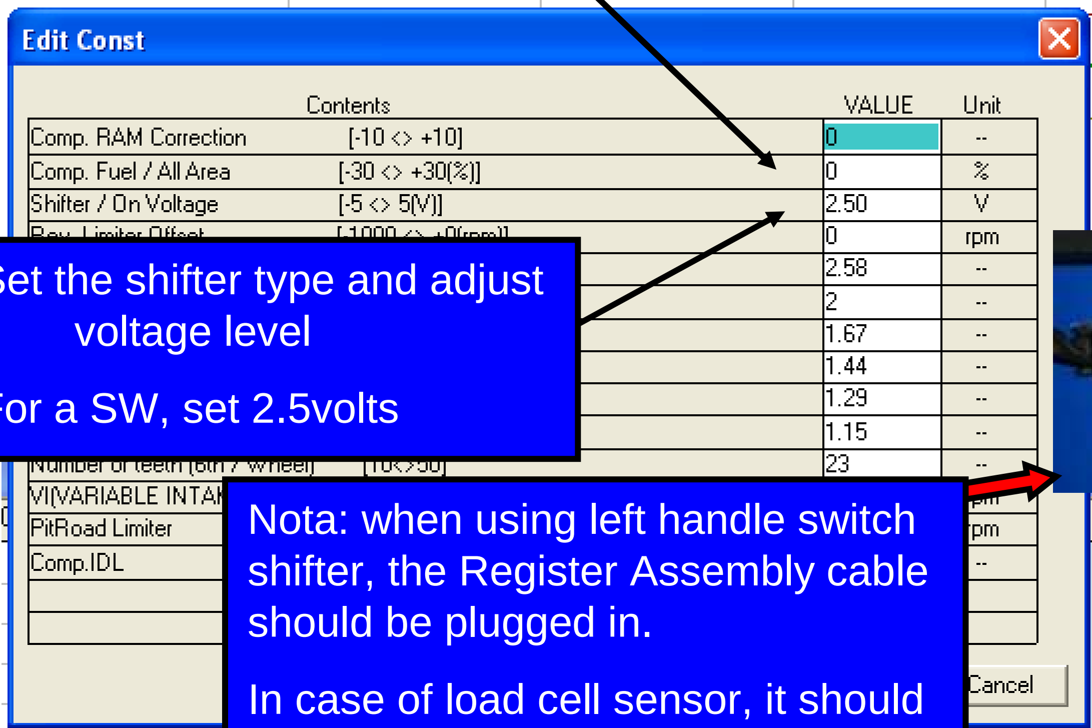
Constant Parameters table

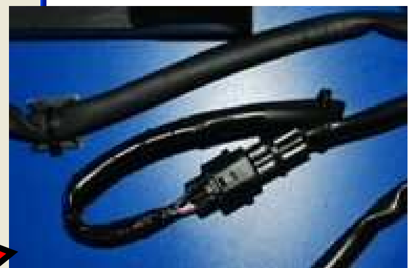
A table of Constant Parameters *"Edit Const"* is used in YMS to set up several parameters such as pit road limiter; shifter type, gear box ratio, Variable Intake, … Those parameters should be fill in properly in order to have a kit system working in the best conditions.

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.

Edit Const

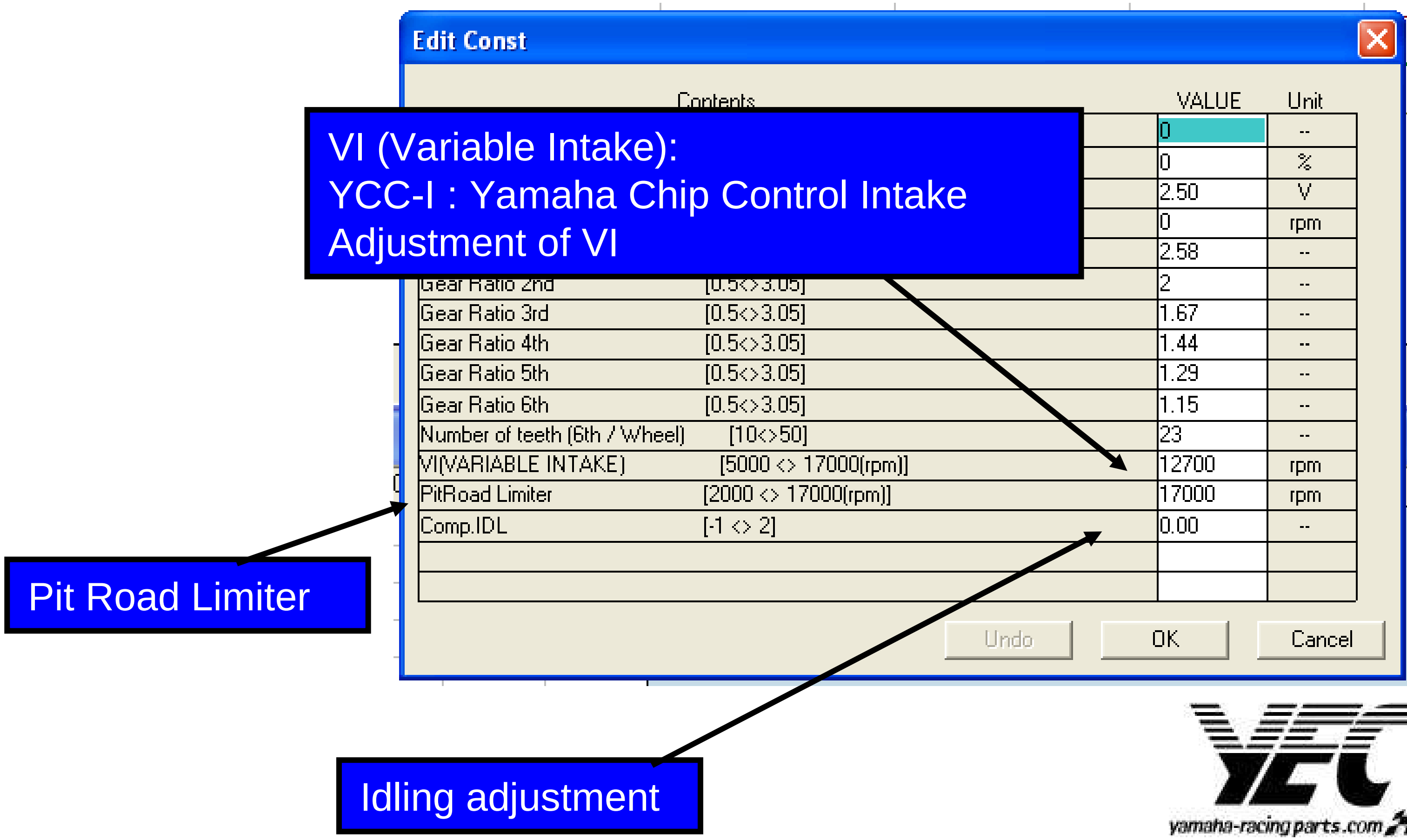
Contents		VALUE	Unit
Comp. RAM Correction	[-10 <> +10]	0	--
Comp. Fuel / All Area	[-30 <> +30[%]]	0	%
Shifter / On Voltage	[-5 <> 5[V]]	2.50	V
Rev. Limiter Offset	[-1000 <> +0[rpm]]	0	rpm
Gear Ratio 1st	[0.5<>3.05]	2.58	--
Gear Ratio 2nd	[0.5<>3.05]	2	--
Gear Ratio 3rd	[0.5<>3.05]	1.67	--
Gear Ratio 4th	[0.5<>3.05]	1.44	--
Gear Ratio 5th	[0.5<>3.05]	1.29	--
Gear Ratio 6th	[0.5<>3.05]	1.15	--
Number of teeth (6th / Wheel)	[10<>50]		
VI(VARIABLE INTAKE)	[5000 <> 17000[rpm]]		
PitRoad Limiter	[2000 <> 17000[rpm]]		
Comp.IDL	[-1 <> 2]		

Undo | OK | Cancel

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

Constant Parameters table

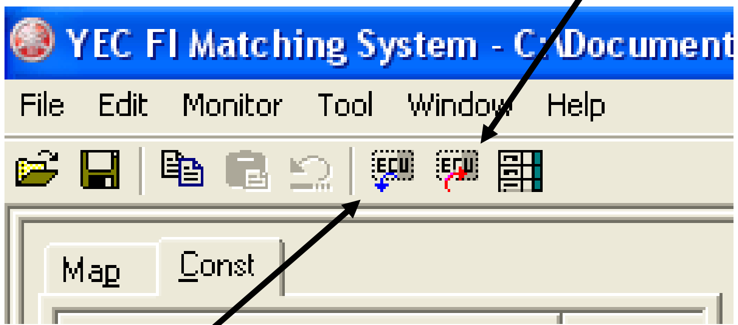
Pit road Limiter is available in Edit constant table. This function work with a dedicated switch and operate on first and second gears. To determine properly the pit road limiter, we suggest you to refer to FI Matching system Manual.



MKPS
Motorcycle Kit Parts Support

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)*

YEC
yamaha-racing parts.com

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

Next month,

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