

Fitting, Electrics – KyTronik, advance box

KYTRONIKS ADVANCE BOX

Before you fit and play with your KyTronik Smart Booster please read this from Mark just to help clear up the Smart Boosters instructions.

NOTE SEE LOWER DOWN FOR THE UPDATE ON THE KYTRONIK SMART BOOSTER LATE 2016 UNWARDS.

These are the latest ignition graphs with help from Mark Broadhurst MB Scooters Ltd Jan 2018

6 degrees Standard to mild tuned engines – start with curve 5, if you think the engine is getting hot – cool it off with curve 4 then E – If you want to push power and heat go from curve 5 to F then A.

8 degrees Mild to road race tuned engines – start with curve 7 if you think the engine is getting hot – cool it off with curve 1 then 2 – If you want to push power and heat go from curve 7 to 6, C then A.

12 degrees Full Road/Race with power that comes in at 5-6000+ try starting with curve 8 – to cool it try 3 – to push more heat – try 9 then D

TIMING AN ENGINE USING A KYTRONIK

Setting '0' is described as the 'Transparent mode' this is the basic setting timing (static timing that does not move) it's the point that the advance will start at..... you need to understand this.

As a basic if you alter your stator plate to set your static timing to 25 degrees, in position '0' your timing should be 25 degrees. If you don't reset your stator plate and you have already set the static timing to say 17 degrees, position '0' will be 17 degrees any click position from there will be too low for the engine to really work. The stator plate WILL need altering to set static timing back to something between 28 – 20 degrees as the instructions suggest.

Look at the first chart in the Smart Boosters link shown below, lets use this as an example to explain how the graphs alter per click position verses stator static timing.

NOTE this diagram is a pre January 2017 Smart Booster. After that curves have altered so find the correct curve drawings to suit the Smart Booster been used.

Setting '0' is shown as 0 degrees, at 2000 – 3000rpm which is the area where we are interested in starting to use a Smart Booster graphs 1, 2, 3, 4 and 5. NOTE these graphs drop 1 degree from position '0' So if you have set the

static timing to 25 degrees the Smart Booster actually starts at 24 degrees. You could tweak to 26 degrees static so the SB starts to work at 25 degrees, if you want to go that far on setting up a SB.

Once the '0' is set you don't need to strobe the engine each time you reset a position on the SB, it works and all you need to do is follow the graphs in the link.

NOTE This is in theory, electronics and magnets in flywheels vary so always recheck your timing on each adjustment by strobing the ignition to see that it moves in the desired range at the desired revs.

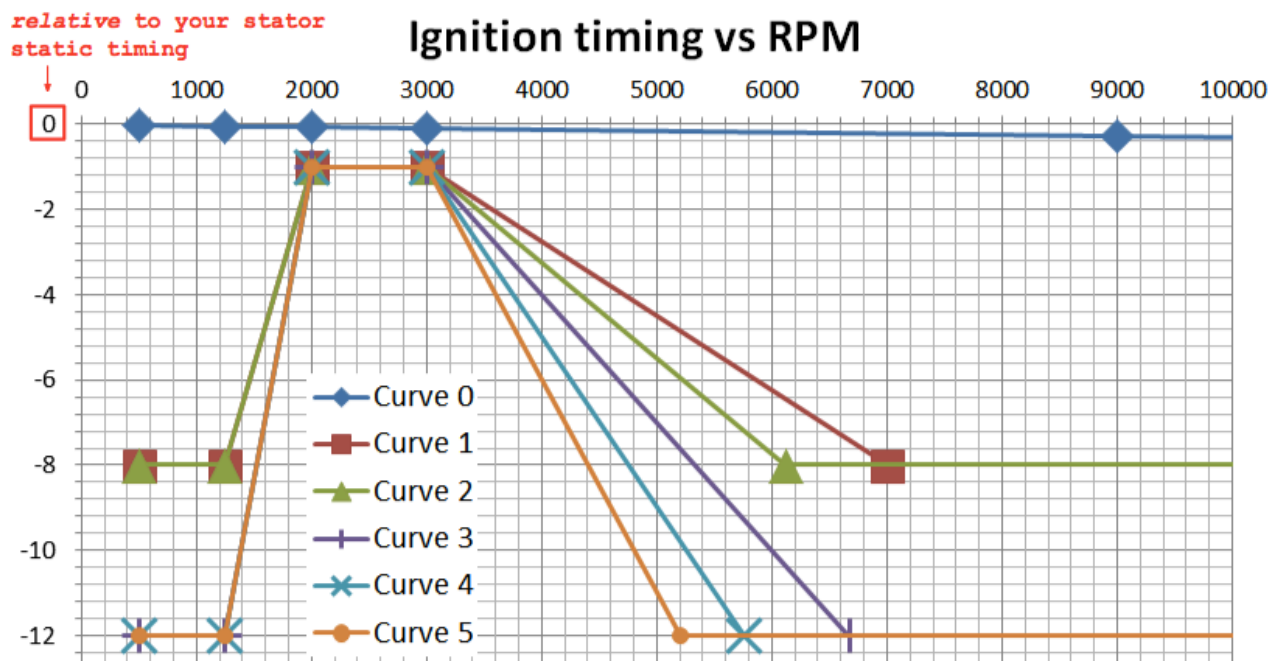
Look again at the chart below at 3000rpm each curve drops in varying degrees. Curve 1 and 2 drops to -8. This is 25 degrees minus 8 degrees which equals 17 degrees, if you have read our Advance retard article this is our magic static/fixed timing which we know to work on all reliable engines. To day with poorer fuels this figure is around 23 to 15 degrees on a highly tuned motor. Look at graph 3, 4 and 5 they drop from '0' degrees to -12 degrees which equals 13 degrees. This could be too much on most engines. BUT we are talking setting the static '0' at 25 degrees. Now if we re alter the stator back to say 29 degrees and graph 3, 4 and 5 drops by 12 degrees to 17 degrees. But positions 1 and 2 will then drop to 21 degrees. See how variable this system is. By setting your static or transparent mode '0' you can use the graphs to plot where you want your timings to be.

TRUST the graphs they work and trust once you are happy with the static timing everything works from the flick of a switch..... As mentioned, always check the settings with a strobe gun.

ALWAYS turn off the engine to reset the little switch on the KyTronic Smart Booster, this is how it is designed.

IF in the unlikelihood that the KyTronic Smart Booster fails there will be no spark and the engine will stop. You can remove the SB from the coil, plug the wires back into the coil and the timing will revert back to '0' at the static timing of say 22 – 28 degrees where ever you had it set previously. Your engine will run fine in low down revs but don't over load it much above 4000rpm. IF it fails you can simply remove the flywheel and reset your safe fixed static timing of say 17/15 degrees.

Please read the links below before you start to fit the KyTronik Smart Booster.



Some technical details (applicable to all curves)

- Variable timing is relative to your stator static timing, "0"
- The curve "0" is "transparent mode". The ignition timing is unchanged.

SMART BOOSTER TROUBLE SHOOTING. Tips to help fault find possible problems that you may think comes from the KyTronik Smart Booster.

People usually knows that they should not mount a new top-end kit on an old crankshaft with ageing bearings, because after few miles there are chances the engine will be ruined. Similarly, tuning an ignition with a Smart Booster or a Spark Magnifier requires the use of a good healthy conditioned electrical components..... Wiring, connectors, stator, flywheel, CDI, etc!

- If SB is dead, in 99% of cases this is due to a poor ground cable (the white one on most Ducati ignitions) connection. The SB needs ground, if you remove it, even intermittently, it will go over voltage and break down. The CDI ground cable is a must to have for correct operation! Due to moulding processes, sometimes there is a very thin layer of plastic covering both sides of the male connectors of the SB. This can unfortunately also explain sometimes the first point..... Solution: take a small/sharp object and scratch both sides of each connector.
- SB is not properly mounted on the CDI. This is due from non-perfect alignment of the female connector of the SB compared to the CDI. This usually causes an intermittent/lousy ground connection and can potentially lead to the SB break-down..... Solution: carefully check SB/CDI connections.
- The CDI is not compatible. So far we had problems with: AF Rayspeed, MITSUBHI, un-branded. They are usually Indian/Chinese copies..... Solution: Change for Ducati, MITSUBA or BGM CDI coils.
- In some rare cases, the pickup and/or the low voltage coil (on the stator) prevents the engine from starting..... Solution: Change the pickup, low voltage coil or stator.
- Wrongly adjusted static timing (for e.g 10deg BTDC). It won't run with

any curve. Maybe with curve 0..... Solution: double-check static timing, preferably with strobe light at 3000RPM.

- Engine “bogs” feels “rev-limited” or “4-strokes”, etc. It can happen after few hundreds miles. In 99% of the cases, the low voltage coil (again) is weak, faulty or defective..... Solution: Change low voltage coil or complete stator.
- In some cases, the pickup is faulty..... Solution: Change pickup or complete stator.
- SB is not properly mounted on the CDI. This is due to the non-perfect alignment of the female connectors of the SB compared to the CDI. This usually causes intermittent/lousy ground connection and can potentially lead to SB break-down..... Solution: carefully check SB/CDI connections.
- People do not strobe the timing properly..... Solution: Strobing must be done at 2500 – 3000rpm.
- Aggressive timing change + jetting..... Solution: start conservative (original static timing and curve 6, 7 or B) and check engine behaviour. Then change for more aggressive timing.

All these points need addressing before we will accept a returned SM.

KYTRONIK SMART BOOSTER 2016 ONWARDS UPDATE

MB are please to say that the new Kytroniks 2017 Smart Booster (SB) has been improved!

The looks of the little Red box and the fitting are greatly improved. The box is now a bolt on item compare to the previous versions which were cable strapped into place. The LED and switch are now slightly protected from the elements and the wires and connections are improved..... Not only that but more importantly the curves are greatly improved – with some advice and feedback from MB Scooters Ltd.

The early versions mainly had wild ignition timing curves, more suited to high revving 10'000rpm+ engines. The majority of Lambretta and Vespa engines used these days are relatively low revving engines! Standard engines only rev to around 6000rpm, with low horse power figures, these types even with the poor quality fuel work perfectly fine on fixed ignition timings. Most engines these days will be kitted engines with more power and higher revs of say 7-8000rpm but still work perfectly fine on fixed ignition timings.

The early Smart Boosters only had a few curves suited to the majority of lower revving engines used. So Kytronik have built in 3 types of curves in their new Smart booster to suit say 1) Standard to Mild – 6 degrees advance. 2) Mild to Wild – 8 degrees. 3) Wild to Full race spec – 12 degrees. All 3 types of curves have different start and finish positions. But now it's much simpler to advise a preset curve to use on a particular type of engine.

With extensive dyno testing with the Smart Booster, MB Scooters have found some interesting information. Some of it is secret but some basics are – you can get more power from an engine with fixed ignition. You can get more power by adding heat into the engine with over the top fixed ignition. But we know from what we have told you in previous write ups that engines don't last as

long using these old fashioned fixed timings of say 24/23 degrees as pistons melt! Again as already said in previous write up's, today an ignition timing of 17/15 degrees seems to work great as an average to keep motors cool, reliable and rideable, but this looses power if your as anal as me in the dyno room!

By using the advance retard features it should give the best all round power from say 25/24 degrees down to 17/16 degrees. But this is not strictly true on lowish revving engines. Power will be lost using these settings with the advance features. What it does do is make your engine nicer to ride low to mid range to flat out and the biggest positive is the engine burns better low down and runs cool enough to be reliable flat out. But there will be some lost of power spread, but on the road you will feel the engine feels better even though power has been lost. So whats right, an engine on the dyno giving the best figures that may blow up on the road or one that looses a bit of power on the dyno but rides perfect on the road for thousands of miles.

Is the SB a good idea? Of course it is, it aids the bike and how it rides and it also cools as you ride making it better all round.

Now we have 3 sets of curves set so you can pick the middle of the road position in any set of curves. You can set your engine up and ride as normal. IF you think your motor is over heating you can flick the switch one or 2 positions down to cool the motor, like wise if you feel you can get more form the motor you can flick up to create more heat and power, but be careful!

Suggested curve positions for engines.

These are used as a guide, every engine will be different depending on the state of tune, exhaust used and compression ratio used.

1) Standard to Mild (6 degrees) try curve 'F' this is the same as position '2' on Mild to Wild, we know this works fine. Or you can simply use position '4' or position '5' these will be safe but also give you the option to move down to a safer position 'E' or if you want push the limits go up to position 'F' or 'A'

SHOW GRAPH EXPLAIN THE GRAPHS PER ENGINE

2) Mild to Wild (8 degrees) try curve position '2' the is the same as the older SB boxes, we've always recommended curve 2, it has worked from day one on most engines including RT kits, RT reed kits and TS1 engines so is a widely used safe workable curve. If your motor seems hot you can drop down to the Standard to Mild settings positions 'F' '5' '4' or 'E'. Of course you can go up to '1' '7' or '6'

SHOW GRAPH EXPLAIN THE GRAPHS PER ENGINE

3) Wild to Full race (12 degrees), these totally depend on how wild your engine is. This comes down to how big your ports/timings are and where the power comes in with the exhaust and how high it revs. These can suit a high revving small frame or full on Lambrettas TS1/RB or something made to rev high and give high horse power. These types of engines are really hard to

ride and power doesn't come in until 5-6-7000rpm then take off to 9-10'000rpm plus. These engines need more ignition low down to compensate for a lack of power then as the engine/exhaust kicks in the motor needs to stay cool as soon as possible. Try something like position '8' and you have the option to drop to position '3' or up one to position '9' or 'D'

Now I've explained mainly from dropping timing down from say 25 degrees to 17 degrees.

Really it's much easier to look at what static timing we need at the engines peak revs/power. As I've stated 17 degrees works on most engines. We know this works, so work backwards. Simple maths tell you 17 degrees minus the 3 sets of curves you can work back 6, 8 or 12 degrees! $17 - 6$ degrees tells you at tick over around 3000rpm (but check out the graphs per curve) your tick over timing should be about 23 degrees. $17 - 8$ shows tick over to be about 25 degrees. $17 - 12$ degrees should be around 29 degrees.

If you want to be super safe on a more powerful higher revving engine or an engine that over heats – work back from a known safe 15-12 degrees. If you still have a very low revving, low powered, low compression engine or an engine that only drives in towns in traffic – static timing can be 20 – 19 degrees.

One thing to mention is – and this is misunderstood by many. Engines that are really rideable like a small exhaust port tune has loads of low down pulling power. These types of engine or an engine with a big piston and long stroke crank can actually ride quiet easily at 30mph in 4th with high gearing. Using an advance box means you could be riding your motor at 30mph in 4/5th gear and the timing has automatically dropped to worst case 25 – 27 degrees. Now if someone told you to set your static timing to 25 – 27 degrees you would disagree knowing it would blow your piston! Add to the fact that these very good low down engines what MB call a Touring, Torquey, Tunes can still do this slow speeds crawling up a hill or into the wind makes things heat up inside the engine.

So do you ride like this? Or do you drop down a gear or 2? This would put the timing to something like more sensible as the engine revs start to rise.

Everything is a compromise, always bare this in mind setting up your engine.

KyTronik PRE 2016 (cable tie version) instructions for the Smart Booster Advance retard ignition box

KyTronik late 2016 onwards (with bolt hole in casting) instructions for the Smart Booster Advance retard ignition box

KyTronic instructions for the Spark Magnifier add on on box

If you have any questions email mark@mbscooters.co.uk