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REF: Engine Control - Sub-50F

Excerpts from XLForum Discussions & Perspectives Related to Ignition Timing Maps

Note by IXL2Relax: Keep in mind that there will always be some argument over the right perspective for creating tuned maps, just as there is for tuning carbs or reading spark plugs. Early experimentation with the TC88A module may have created maps based on a different perspective of the required timing than the later maps that were built. However, as always, every engine wants and needs settings that are specific to that particular build configuration. There is no One-Size-Fits-All timing map even when the engine configurations, terrain, single/double riders, weight and riding styles (which all affect engine performance) are all very similar.

It is the responsibility of the user doing the tuning to evaluate the information they find in order to know that it is compatible with their engine configuration and riding circumstances. Also realize that those who are aggressive riders will often tune right to the edge of usability in searching for a bit more power or responsiveness, while other, less aggressive riders, may prefer to tune their timing to avoid problems from some variables and factors that might push it over the edge.

If, somehow, you overlooked these, be sure to read these comments:

[Why Adjust The Spark Timing?](#) by **RacerWill**

[Too Much Advance Timing](#) by **Aaron Wilson**

[Manifold Absolute Pressure -vs- Vacuum Reading](#) by **RacerWill**

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-electrical/sportster-motorcycle-electrical-and-ignition/132778-daytona-tc88a-do-your-own-mapping-tips-questions?t=1422868>

### Post#117 - Xena commenting on 'Best Map' - May 2012

All bikes are different and all like different timing. That taken into consideration, there is no "best" Map. Imho, there isn't that much different from the maps we write now as opposed to the maps Turbota initially wrote. The module is the same, the numbers in the cells are just changed around. No big revelation there and anyone with the module, a compatible computer, and the cable can experiment with changing numbers around. (I recommend starting with Turbota's Maps as a baseline, then alter from there).

Also worthwhile to note that Ron ran his own Map in his high compression bike with good power and no

problems. Additionally, several folks on this forum have been running Turbota's map in their high compression engines from day one with excellent results.

### **Post#123 - Xena responding to some posts:**

(Original question posted by ~Grind~: So Rick, How do you come up with the values in your maps? Trial and error, educated guess, mathematical formula?)

Hmm. Since it looks like nobody is gonna step up to the podium I'll answer. Everyone who is doing their own now started out using Turbota's Maps as a starting point and from there it was trial and error. As far as my developments, I'm finding that Buzzelli's guidelines are close. If I go one way or the other too much I can look at my spark plugs and confirm that something isn't right in addition to feeling it in the performance of the motorcycle. I also feel quite strongly about the fact that in order to get it as close as possible, one must be able to test ride the bike they are mapping after each tweak.

(Original comment by hdwgfx: I just didn't know the generation.)

Generation? There isn't any. There are lots of folks who have written their own Maps who have pm'd me and told me so but they don't wish to be known because they're afraid people will ask them for maps. Trial and error changing values in cells and uploading to the same module that Turbota used. Same concept. Different numbers. After awhile there are only so many timing curves that are gonna prove to work the best in a given bike. Finding that out is not difficult, it's just time consuming. (edit, upload, test ride) Don't let people make ya think it's rocket science because it's not. And as Lenster said, don't be afraid to change the values to get a feel for how the bike responds.

### **Post#125 - Xena Further Comments:**

Well yes, people might want to put labels on it but the fact remains that the module and the software and the process to program it is the exact same now as it was when Turbota brought it to us.

You can write your own Map and call it whatever you wish, but the tools and the way you get there is the same whether you program it or someone else does so imo there is no 1st or 3rd gen. To most that implies the hardware and or software is new which is not the case at all.

Also keep in mind that many of us are writing our own, which is the basis of this thread. If you are interested in writing/loading your own you just need the module, the software, the cable, and a Windows based computer. As noted earlier in this thread I'm running what I've dubbed the "Black Panther" Map. It's just another Map in addition to the many Maps that lots of other people have written. I am really not interested in writing Maps for others, but rather in learning and sharing with folks who want to or are currently doing the same. Sorry for the long winded reply, I'd just rather not confuse people with that gen. stuff in this particular thread because from a technical standpoint it really doesn't apply at all.

### **Post#132 ~Grind~ posting this seen on Nightrider website.)**

#### **Some General Rules-of-Thumb Related to Ignition Advance**

Low engine load = more spark advance

High engine load = less spark advance

Cold engine = more spark advance

.... (& colder weather makes colder engine)

Warm engine = less spark advance

.... (& warmer weather makes warmer engine)

Low RPM = less spark advance

High RPM = more spark advance

Regular grade fuel = subtract 2 degrees

Mid grade fuel = subtract 1 degree

Premium fuel = no adjustment

Optimized squish band = subtract 2 degrees

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<http://xlforum.net/forums/showthread.php?t=336441>

Post#10 - Turbota - Nov 2008

The problem with using just the switch positions - Like someone else said - The TC88A was not designed for the Sporty.

Basically, you get too much timing down low ... but not enough timing up high. No matter what set of switch positions you use, the difference between idle timing and high-rpm / wide-open-throttle operation just ain't right.

You don't want the timing table to look like this (This is switch position 3 -5):

23.1 degrees @ 15" MAP / 1,000 rpm (Idle) ... way way too much timing

35.9 degrees @ 20" MAP / 2,500 rpm (Cruise) ... too much timing

31.4 degrees @ 30" MAP / Above 4,500 rpm (Wide Open Throttle) ... too little timing

This is the timing table I program into the TC88A (this is the "Modified MAP 35" program)

15.0 degrees @ 15" MAP / 1,000 rpm (Idle) ... just right

30.2 degrees @ 20" MAP / 2,500 rpm (Cruise) ... just right

35.0 degrees @ 30" MAP / Above 4,500 rpm (Wide Open Throttle) ... just right, and makes more power!

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-electrical/sportster-motorcycle-electrical-and-ignition/11396-final-tc88a-map-program-lots-of-other-data?t=18702>

### **Post#396 - JBM - Aug 2007** - Spark advance for manifold pressure below 16 In/Hg

To me it's still a mystery why TC88A doesn't calibrate values below 16 in/hg. In HD's own Screamin' Eagle Ignition Race Tuner (SERT) you may customize the stock ignition module with SE ignition curves and calibrate map values in the range of 0-16 in/hg also. The SERT/OE range is 0-103 Kpa (0-30 in/hg), while the Twintec range is 54-103 Kpa (16-30 in/hg). SERT has 9 rows, and four of those are below the TC88A lowest row. I ran SERT before I installed TC88A.

### **Post#412 - JBM - Aug 2007**

This morning I sent an email to Chris Schroeder from Daytona Twin Tec and asked about those advance issues for manifold pressures below 16 In/Hg in TC88A. With his permission I publish his reply:

**Very few engines require additional spark advance below 16 in-Hg manifold pressure. The TC88A uses the 16 In-Hg value for all lower pressures. As further clarification, internal cylinder pressure is so low under these conditions (MAP below 16 in-Hg) that maximum spark advance values near 45 degrees are reasonable for most engine applications. Since 45 degrees is the maximum advance the TC88 series is capable of, there is no reason to complicate the advance tables. Even higher advance values yield little benefit.**

### **Post#1005 - Turbota - June 2010**

I thought I would just post a photo of the 4 MAPS I wrote for the TC88A.

The first 2 photos are of the "MAP Modified 33" and "MAP Modified 33 Revised" programs. These are basically identical programs except the Revised program has a little less timing at part throttle operation. Idle timing and WOT timing is the same for both of them.

The second 2 photos is the "MAP Modified 35" and "MAP Modified 35 Revised" programs. These are basically identical programs except again, the Revised program has a little less timing at part throttle operation. Idle timing and WOT timing is the same for both of them.

You will notice that the main difference between the 33 and 35 programs is the max timing. The 33 programs limits the timing to 33 degrees above 4,000 rpm, while the 35 programs limit it to a max of 35 degrees.

Idle timing in all these programs is set to 15 degrees ... It seems like anything much less than 15 degrees will cause "carb farts" when the throttle is "blipped" slightly just off idle (idle tip-in)

### **Post#1023 - MisterT - July 2010**

I went with the map mod.33 (set for 31 degrees ttl) after reading a post by Aaron from ASW racing stating that anything over 28-30 degrees of advance starts to reduce power. He is one of the very few that has done extensive dyno testing on advance curves among other mods.

### **Post#1024 - Foxster - July 2010**

I played a lot with these maps and variations of my own devising and I'd say the 33 map is the best I found with just a couple of minor tweaks. 35° is generally too much advance for these engines, you will almost certainly get some pinging with that much advance, especially with some of the poor grades of fuel you get in the US these days.

I never dynoed while I was playing with this stuff but a reasonable rule of thumb is to advance until it just pings and back off a couple of degrees and that's pretty much where you'll be with the 33 map. Personally I took another degree out at WOT (max 32°) and did a little smoothing around the 2000 rpm area and that suited my other hardware real well.

### **Post#1025 - Rico05r - July 2010**

I've written nearly 40 separate maps for different Sportsters from 883's to 88 inch kits. Here is what I have learned: Every bike is different in how much advance it will tolerate before pinging...even if they are virtually identical in how they are equipped. That's the wonderful thing about the TC88, if the map you have leaves something to be desired, you can always load a different one.

### **Post#1054 - Rico05r - July 2010**

The canned maps in this unit are for Twin Cams. To look at them select new map and set the initial

timing and advance values to where you have the dials set and you will see the canned map for those settings. If you compare them to the ones written for the Sportster, you will notice that the TC maps have much more advance down low and less up top than the ones specifically written for the Sportsters.

### **Post#1079 - Rico05r - July 2010**

The canned maps are all for the Twin Cams. In order to use this module properly for Sportsters you really need to do a custom map. The reason being, is Twin Cams require much more spark advance at lower rpms and less advance at higher rpms than the Sportsters. See the first few posts that Ron wrote in this thread for a more complete explanation. Bottom line is this module was made and pre-programmed for the TC motors. But by using the custom mapping features we have been able to develop really good maps for Sportsters.

### **Post#1116 - Rico05r - Aug 2010**

222 is a good "Street" map, but was not written as much for max HP as it was for "driveability". This map (Hooligan) is very rideable like 222, but when you twist the throttle open on this one... I've increased timing in a very small section of the map and lowered the max advance across parts as well.

### **Post#1115 - Xena**

Rico hook me up too please! When u get a chance can you also send me the 222.

### **Post#1117 - Rico05r**

Sure thing. You would need to retard the timing some if you want to use either of them with your higher compression pistons.

### **Post#1129 - Rico05r (to chardhin)**

Definitely keep the other map I wrote in your bike. The timing in this map is too far advanced for your high compression pistons. I only sent it for you to look at.

### **Post#1136 - Bob99**

Rico, it would be my pleasure to share my comments regarding your newest map, "Hooligan", after having ridden with it for the past three days. I'll start out by saying it's terrific! Above 2800 RPM, the bike starts taking off with tremendous torque and power, and above 3500 RPM, the bike sings! I cannot believe the power that is unleashed from my engine. I've literally got to hold on tight to my handle bars because of the awesome acceleration. Additionally, there is no ping in whatsoever.

### **Post#1162 - Xena - Aug 2010**

To date I've tried one of Rico's older Maps, both of Turbota's Mod Map 33 and Map 35 rev 2, The 1212 Map Rico sent me for my bike, then another 1212 he sent that he modified again, then the triple deuce, and then this 4 of a kind. Bike runs noticeably smoother with this one over any of the others.

### **Post#1187 - Rico05r - Sep 2010**

Just trying to give back for all those that have helped me. A couple of things I've learned about the Big Bore conversions and mapping. The differences between bikes can be significant in how much advance they will tolerate. I currently have several versions of the 4 of a Kind. Each one I've tailored for individual bikes. Chardhin has one version on his 1212, I made some adjustments for Xena's 1212 based on how hers runs, and I have another version I've tailored for a Bro in Italy with a 1250. It would seem that with the higher compression pistons, mapping is a bit trickier. Even down to a half a degree of advance. I appreciate everyone who has been willing to use my maps and given me feedback. It helps me make better ones and I've learned a ton.

### **Post#1196 - Xena - Oct 2010**

Today I tested Rico's Hooligan/Big Bore Map with favorable results. Bike has far better manners with this Map over the 4 of a kind I had prior. Things I noticed right away over the 4 of a kind: More power. Turns a couple hundred less rpm's. Zero ping in any of the gear/speed/rpm combo's I tried. More testing

scheduled for the weekend. Double thumbs up for Rico on this one!

### **Post#1265 - 05XLC - Jan 2011**

I totally agree, I emailed Daytona Twin Tec Tech Support about getting a base Map for my 1200 conversion, gave them all the details, let them know that any help would be appreciated and the return email was: "Other than the general recommendations in the instructions, some trial and error tuning will be required."

No introduction, No thanks for your query and certainly no Fkin Help. What you see above is the whole email, not evens a regards.

My hat goes off to these guys that do provide us with these tables, Very much appreciate it. I have only one at this time and that is Rico's Hooligan Map (Thanks again Rico) but I could have been digging a whole lot of hurt for myself without it.

It's a shame that you guys and girls are the only people who are providing Daytona Twin Tec's after sale service, Daytona Aren't, and I appreciate it as I am sure every other person who has benefited from your work.

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-electrical/sportster-motorcycle-electrical-and-ignition/132607-tc-88a-chat?t=1419021>

Post#235 - Rico05r

The 8 Ball maps are for 1250's. The Jester III and Hooligan maps are for Stage 1 bikes.

Post#256 - Rico05r - May 2012

I have a newer version of the Jester 8 Ball map for the 1250's.

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<https://www.xlforum.net/forum/sportster-motorcycle-forum/sportster-motorcycle-electrical/sportster-motorcycle-electrical-and-ignition/132778-daytona-tc88a-do-your-own-mapping-tips-questions?t=1422868>

**Post#193 - Highly-Dangerous mentions Turbota's maps: MAP Modified 35 / MAP Modified 33 / MAP Modified 35 Revised - Nov 2019**

**Post#194 - Rocketmangb replies: "All of those are ancient. Dont use them."**

**Post#202 - Wedge comments:**

Years ago, that was a plague at circle track. Everyone pushing the timing to around 36. Fact is that it doesn't do a damn thing for you except burn down a good engine. If memory serves me correctly, 32 was about the max you could go without it being detrimental. As I remember, the best was usually around 29 to 31. It's been a while, so I could be off a bit on the actual numbers, the principal is what is important.

If you are getting pepper flakes on the plugs, back the timing off. If you hear any ping under load while accelerating hard (that's the first test you should do), back it off. When I test max timing I run a gear higher than normal on a medium hill and see if it can take WOT without complaining, then I read the



plugs to make sure they aren't screaming a different story. Any time you pull plugs, you should read them and look for pepper, write down your findings for future reference.

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