Tuning AFM

Posted by Sterling Doc - 30 Jul 2011 19:33

One thing I haven't seen explored much online is how and why to tune the AFM. I see Joe posted up a while back on the NASA Spec boards that removing the cat as we do can mess with A/F ratios, and that there is some benefit to fixing this with an AFM tune. I'm interested in what people have found with this. What A/F ratio are we shooting for? Do you guys adjust the wiper/track, the spring tension, or the air bypass screw on the AFM? How much does a click one way or the other change things? After we've found some lean issues in local cars, I've just put an AEM A/F ratio gauge, and will log this with the Traqmate. I'm happy to share what I find, when I do start checking things out.

Thougts & experiences?

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Re: Tuning AFM

Posted by 944Racer72 - 31 Oct 2012 07:38

If the AFM is out of the loop at WOT, how does adjusting the AFM effect top end HP? This doesn't make any sense.

My understand was the same as TC's. The DME is closed loop at WOT so the chip is determining fuel, timing, etc.

Changing the AFM should help part throttle power but it should have no effect on WOT HP numbers.

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Re: Tuning AFM

Posted by loftygoals - 31 Oct 2012 08:00

944Racer72 wrote:

If the AFM is out of the loop at WOT, how does adjusting the AFM effect top end HP? This doesn't make any sense.

Ah, this is the big question. I've been doing some reading on Motronic 1.x vs. 3.1 and the early vs. late AFM. Tim, assessment is close, but not quite all there. I don't have the time to give a detailed response this morning, but I will soon.

Thanks,

-bj

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Re: Tuning AFM
Posted by RangerGress - 01 Nov 2012 08:59

Gents, I'm a SpecE30 racer. We learned the hard way a couple years ago to approach the idea of adjusting the AFM a few clicks too and fro with some caution. In this thread you guys seem to be pretty casual about it, but I submit that you aren't accounting for long term fuel trim which I think is very similar between our cars.

Bottom line up front....

1) You can't move the AFM dial a few clicks and then do an accurate dyno run because you haven't given long term fuel trim (LTFT) time to adjust.

2) Once it does adjust you might not be happy with the results.

See this thread.... spece30.com/forum/44-intake-and-exhaust/...girls-re-hi-rpm-miss

This post is an important one. spece30.com/forum/44-intake-and-exhaust/...0&start=20#61115

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Re: Tuning AFM
Posted by 944Racer72 - 01 Nov 2012 09:31

Thanks for posting. That is some very interesting info and jives with my understanding of how the DME works.

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Re: Tuning AFM
Posted by Sterling Doc - 01 Nov 2012 10:16

This is interesting, and I need to take some time to read the whole thread. One thing that might be different, though, is that the O2 meter is very much an emmisions only add on to the 944 ECM. Euro 944's had no O2 sensor at all. Our cars just revert to the baseline maps with the O2 sensor unplugged, and run fine (like a euro 944) that way. I don't think the O2 sensor affects the WOT throttle maps at all, and if you unplug the O2 sensor, there is no way for adaptation to happen. I am not an expert on this, so I'd love to have BJ and others chime in.

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Re: Tuning AFM

Posted by RangerGress - 01 Nov 2012 10:45

Sterling Doc wrote:

This is interesting, and I need to take some time to read the whole thread. One thing that might be different, though, is that the O2 meter is very much an emmisions only add on to the 944 ECM. Euro 944's had no O2 sensor at all. Our cars just revert to the baseline maps with the O2 sensor unplugged, and run fine (like a euro 944) that way. I don't think the O2 sensor affects the WOT throttle maps at all, and if you unplug the O2 sensor, there is no way for adaptation to happen. I am not an expert on this, so I'd love to have BJ and others chime in.

What you describe is how our Motronic 1.3 works too, and that's part of what causes the problem I described. Well, conjectured upon, really.

The O2 sensor plays at partial throttle so the DME can accurately control mixture while the loosened AFM spring has caused a long term fuel trim (LTFT) to be a bit lean. But at WOT the O2 sensor no longer plays and the DME is running on internal maps with only coolant temp and CPS as significant inputs. This creates a scenario where a lean LTFT can go from "bit player" to significant player".

I would never had understood what was going on if I'd not had a year of track events with an F/A meter on the dash and hooked to the Traqmate. It was dicking around with the AFM spring that caused it all. Or at least, so my theory goes.

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