

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.

Thoughts & experiences?

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Re: Tuning AFM

Posted by Sterling Doc - 03 Aug 2011 20:26

Yes, lots of great information on the FR Wilk site, but their only AFM tuning advice is to say to not do it. You certainly don't want to lose where the factory spring tension is set, but since there are indeed spots that the spring is attached to, you should be able to return it to the OEM calibration easily enough if you want.

The one bit of advice I've received so far is to shoot for an A/F ratio in the low 13's, but I have no evidence to back that up yet. Maybe a crosspost on Rennlist would be helpful...

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Re: Tuning AFM

Posted by cbuzzetti - 03 Aug 2011 20:35

Yes read the last paragraph very carefully, all the way at the very bottom of the page.

Once i get my dyno sheet i can tell you what my A/F ratio was.

I did find a sheet from 08 for the #999 car but it was before I put a fresh motor in it. the A/F ratio was between 14 and 13.2 to 1.

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Re: Tuning AFM

Posted by Sterling Doc - 03 Aug 2011 21:07

This is all I see down there? Changing the Spring Tension of an AFM:

Don't do it! Never change the tension of the spring on your AFM. You will destroy the calibration of your AFM. The AFM is laser trimmed to a fine tolerance by BOSCH.

Your dyno data is helpful, though, thanks!

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Re: Tuning AFM

Posted by joepaluch - 04 Aug 2011 06:44

There are two ways to adjust the AFM. One is to remove the metal plug in the top of the unit. Under here is an adjustment screw. Turn it to adjust the bypassed air flow to shift the curve up or down. The other is to pop of black plastic cover. Under here I believe you can shift the wiper slightly. Again this moves the A/F ratio curve up or down.

Neither of these methods change the curve. What I mean by this is that if you are a little rich at 4000 rpm and little lean at 5500 all you can do is adjust it so you are little richer at 4000 and ideal at 5500 or idea at 4000 but way lean at 5500. You cannot tune the A/F ratio at each rpm to dial in perfect.

Back in 2003 I had my car on the dyno and Chris Cervelli of technodyne (since closed down) adjusted my AFM by popping off the black cover. My motor was a little lean at high rpm due probably to not using the cat. By richen up the mixure a tiny bit we got 1 more peak hp and more importatly were not running to lean at rpm. This is key to ensure you don't pop a headgasket. Curve was not idea accross the rev band, but since all he could do was shift the curve up/down it was best we could do. Since then I have never adjusted it again. 2-3 years later I dynoed the motor again and A/F ratios seems solid so I did not try to adjust it.

Now...never attempt to adjust A/F ratio unless you are on a dyno. It is very easy to over adjust and either go super rich or super lean. The adjustment is not really designed to be tweaked and while it can be done you really need to be on the dyno to properly make sure it goes where you want it. Checking plugs is good first approxmiation, but cannot tell you if you are lean or rich at certain points in the rev band.

Target A/F Ratio is upper 13's to upper 12's. I think 14:1 is rather lean especially at high rpm. Stocimetric is 14.7:1, but to make good power and limit detonation you want be more rich than that. Turbo cars can run as low as 11.5:1 and run well, but NA cars tend be better in the lower 13's. 12.5:1 is probably about as rich as you want to be.

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Re: Tuning AFM

Posted by cbuzzetti - 04 Aug 2011 07:21

Thanks Joe, that is great info.

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Re: Tuning AFM

Posted by cbuzzetti - 05 Aug 2011 16:17

OK I got a look at the dyno sheet from just before Nats last year on my 924s.

Air Fuel was upper 12s till 5,000 RPM then got fatter as RPM went up. It richened up to 12.0 to 1 at 6,300 RPM.

Peak HP was 143.8 at 6,000 and peak TQ 143.7 at 3,800. The TQ curve is pretty flat from 3,800 to 5,000.

This is with the head that check exactly at 10.5 to 1 compression at Nationals.

It has since been deemed illegal due to the head thickness rule. It was swaped out for a fresh head after Nats.

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