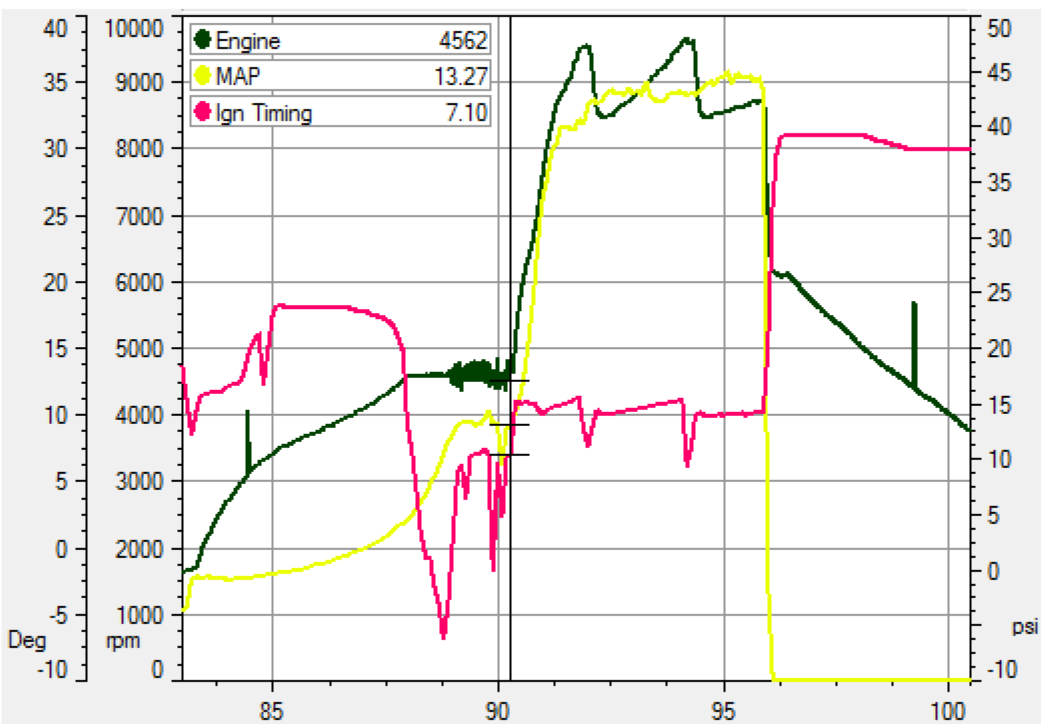
6-BOLT IN A 2G KIT AND CONVERTERS

DSM Automatic Transmission

6-Bolt in a 2g Kit - this product was developed to allow a 2g transmission to be mated up to a 6-bolt engine without bottoming the torque converter into the pump and trashing the transmission. This allows 2g cars to use a 6-bolt engine, which has generally been the preferred DSM engine to use in racing purposes. This also allows adapting a 2g transmission into a 1g vehicle (with other changes) and using the Precision Industries 9.5" billet converter. The smaller converter allows a higher stall speed and the ability to run a larger turbo, particularly without nitrous.

Torque Converters and Stall Speed - a properly matched torque converter to the engine's power curve is the most critical aspect to getting down the track at the best ET possible. This is especially critical in a high boost application as the balance between too tight down low to get the turbo spooled and too loose up top is particularly difficult to achieve. The goal is to be able to come up to launch boost within 4.0 seconds, then also pull the engine down a minimum of 1000rpm on a shift, preferably closer to 2000rpm. It is relatively impossible to get an 11" converter too loose for the torque and rpm range the 4g63 runs. The challenge with a restalled stock converter is getting a turbo bigger than a ~60mm inducer on a 2.0l or ~65mm inducer on a 2.3l spooled up without nitrous. This means a k-factor at about 230-240 or stalling a bit over 3000rpm at 0psi boost on a 2.3l. The 9.5" billet converter from precision industries can be set up considerably looser. It can easily be set up to spool a 74mm turbo on a 2.0l, but slip up top with this loose of a converter becomes a real issue. This can be about 4200-4500rpm at 0psi with a 2.3l or a k-factor around 340. The Kiggly Racing drag car runs a converter with a k-factor in the 270-280 range. Below is a graph from a 5.31 1/8mi pass with a 1.245 60', showing the timing and boost levels.



K-Factor - this is way more meaningful than calling out stall speed and the only thing that makes sense for a turbo car. Stall speed is a function of torque. Torque is a function of boost. As boost goes up, the engine makes more torque and this forces the torque converter to stall higher. Torque is directly proportional to the absolute pressure in the intake manifold, making about 5.0ft-lb per psia per liter (this is a reasonable approximation for all engines). The governing behavior is

k-factor = rpm / square root of torque

or rearranged to be

rpm = k-factor * square root of torque

Tips and Tricks for Spoolup - unfortunately there is no free lunch, but there are some general guidelines that work well. More timing is generally a bad thing for spoolup. Turbos harness heat energy and mass flow; and the more timing you run, the colder EGT's are and the less energy exits the exhaust port. Also as you run it richer, the mass flow increases a little bit. In general, play around with the tune down low to see what is the minimum timing you can run before it starts to flash lower and then add in a bit of fuel again until it starts to flash lower. I've found I can pull out a lot of timing without losing flash stall (18deg on my car currently), but too rich and it loses stall speed quickly. The minimum timing and richest to still make good power will spool the turbo the quickest, prove it to yourself with datalogs. Advancing the intake cam will also always make more low end torque and better spoolup, but at the expense of top end power. This is the reason the Kiggly Racing drag car has a MIVEC intake cam setup.