



**Here is a list of things to check before coming for a tuning appointment.**

**Issue to address prior to dyno tuning:**

## **Section 1: Engine, MAF, Intake, Charge Pipe/Intercooler System, Turbo Integrity**

Make sure your intake filter and MAF sensor has been properly cleaned and that the o-ring is sealing properly in the MAF housing.

Vacuum, pressure, or smoke check all MAF housing, intake, charge pipe/intercooler, turbo, and vacuum lines.

Check the full exhaust system from leaks from the exhaust ports on the head to the tailpipe exit.

Check the BOV to make sure it is seating and sealing properly.

Test for excessive turbo shaft play.

Compression Tests should be performed on a warm engine, with the fuel injectors unplugged, and the throttle should be held fully open while testing.

A Compression Leakdown Test (CLT) can also be performed on a warm engine.

Check for any engine oil, other lubrication, or fluid leaks.

## **Section 2: General Pre-Tuning Maintenance Questions**

Do you have all fluid levels where they need be?

Do you have a sufficient amount of the proper quality fuel in your tank?

Do you have any Check Engine Lights (CEL), Codes, or Malfunction Indicator Lamps (MIL) on?

When was the last time your fuel injectors were cleaned and checked for a system balance?

Do you have sufficient electrical grounding?

How old is your fuel filter?

How old are your spark plugs?

Can your vehicle drive straight?

Can your vehicle drive onto the dyno safely under its own power?

Can your vehicle stop properly in an emergency situation?

How strong is your battery/alternator?

What would you like to accomplish with your dyno tuning session?

### ***Wiring***

Please make sure your car is not a wiring disaster, as this can cause many time consuming delays hunting down issues. Swapped cars will need the green plugs and test connector clips to be flashed.

### ***Codes***

If the check engine light is on please consult with a BrenTuning employee before you make the appointment so that we can resolve the issue before the car is on the dyno.

Common codes for Tune related issues that are remedied in the mapping:

P0244 – Wastegate malfunction (overboost from free flow exhaust or improper mapping)

P0420 – Aftermarket exhaust and or off road pipes installed

## **Fueling Issues**

### ***Fuel***

No matter what fuel you are tuning on, you will need to have a half tank of gas in the car for the tuning session. This usually equates to about 5 gallons of gas. We recommend SHELL or SUNOCO fuel for best numbers. If we have to remove the car to being out of fuel on the dyno you will be charged for removal, and re-installation on the dyno.

### ***Fuel Pumps***

All levels of car EVEN STOCK could benefit from a fuel pump. If we find the fuel pump is inadequate on the dyno - you will be charged the full tuning rate and the rev limiter will be lowered to a safe level. The fix tune after the fuel pump will incur normal dyno costs. Please purchase and install an AUTHENTIC Walbro 255 GSS342 or DW 300 fuel pump. Do not buy these from ebay!

### ***Fuel Pressure***

HIGHLY MODIFIED CARS: We recommend having a fuel pressure gauge. Base fuel pressure with engine on and vacuum line removed should be between 40-50psi for most applications.

### ***Injectors***

Make sure there are no vacuum or fuel leaks as a result of torn or old o-rings. Also, make sure your fuel injectors are sized appropriately for the power that you are trying to make. Below is a quick guideline for injector to power rating:

- 440cc/min: 200-265whp
- 550cc/min: 265-315whp
- 650cc/min: 315-345whp
- 750cc/min: 345-390whp
- 850cc/min: 390whp-450whp
- 1000cc/min: 500whp
- 1200cc/min: 600whp

- 1600cc/min: 700whp

HIGH HP cars: \*Note that more power can be made with the same size injector with higher base fuel pressures. You must have a fuel pump that sustain high fuel pressures. The BEST pump we have found is the Bosch 044 inline fuel pump for 450hp+. Using a Walbro 255lph HP intank fuel pump, and the Bosch 044 fuel pump inline fuel pressure can be held in the 120-130 psi range. With high base fuel pressures of 60-70psi, 20-30% more cc/min flow can be had from the same injector size. If using E85 fuel, all injector ratings will be approximately 30% less.

## **Mechanical Issues**

### ***Engine***

Compression test results should be as follows:

- 8:1-8.5:1 compression: 130-160 psi per cylinder
- 8.5:1~9.5:1 compression: 160-200 psi per cylinder
- 9.5:1~11:1 compression: 210-275 psi per cylinder
- 11:1+ compression: 250+ per cylinder (highly depends on cams being used)

### ***Valve Lash***

Make sure the engine has proper valve lash for the cams being used/installed.

### ***Timing Belt***

- Needs to be installed properly.
- Should have minimal to no slack. If it is too loose, you run the risk of skipping a tooth or running incorrect timing.

### ***Boost Leaks***

Some of the more common types of leaks are:

- Inlet rips or tears
- Throttle body boot
- Y pipe leaks
- BOV/BPV leaks
- FMIC piping

**Pressure test before a tuning appointment or ask BrenTuning to add this to your service. All leaks will need to be fixed before tuning.**

### ***Clutch***

Make sure your clutch you are using is rated for the power that you plan on making. DO NOT come for a tuning appointment with a 100whp+ over stock setup with a OEM clutch! We see this happen all the time, and your tuning session will be cut short due to clutch slippage. Your car will be reduced to a lower power level. You will still be required to pay the full tuning fee. If you plan on making more than 550whp level, it is a good idea to run a twin disk clutch. They are more expensive, but give superior torque capacity holding and high rpm shifting. If you would like to discuss what clutch is best for your application, or pricing please email prior.

### **Turbo System Issues**

#### ***General Information***

- Make sure you have secured your pipes so that they do not blow off. Use silicone hoses where and t-bolt clamps. Also, have a ridge or bead welded to the edge of the charge pipe so the clamp has something to bite to.
- Make sure all of the bolts are tightened and you don't have exhaust leaks. If not sure a smoke or seafoam test will show all leaks.
- Make sure the o2 sensor hole is big enough to fit the common wideband sensors.
- Make sure the blow off valve is tight.
- Be sure to use the proper oil feed and return lines and that they are installed properly.
- Turbo shaft play. A bad turbo will not perform well.

#### ***Exhaust:***

Turbo cars should run 3"exhausts. Most can run 2.5" just fine at lower HP levels.

#### ***Spark Plugs***

2.0L

- BKR6E (up to 280whp) BKR7E (up to 500whp)

AVOID -11 part numbered plugs

2.5L

- Stock or LFR7AIX (1 step colder)

### *Basic Things to Check*

- We have a Dynapack Dyno and a Dyno Dynamics. We take the wheels off of your car to tune the car with the Dynapack. **Do not come to the appointment without the wheel lug key if you have locking wheel lugs.**
- Bring extra spark plugs if you don't want to pay for them. New spark plugs are NOT included in the tuning rate.
- Make sure all fluid levels are up to par. If you run out of oil/coolant - it is on YOU.
- Make sure your thermostat is working correctly. Bleed the coolant system before you come for the appointment. If your car is overheating or overcooling, DO NOT come for the appointment. I cannot tune a car that is overheating or overcooling.
- We can tune an automatic car, ONLY IF, the transmission is able to be locked into a particular gear. The dynapack dyno calculates horsepower and torque by knowing a single gear ratio. If the automatic transmission shifts into different gears while under a load, the dyno cannot provide the proper load and cannot calculate horsepower/torque. Some cars may allow only high rpm runs when the converter locks up.
- Make sure you have the correct size wastegate spring in your wastegate (turbo cars only). You can typically more than double the rated spring pressure with a boost controller. If you only plan on running pump gas, use a lower rated wastegate spring and run a boost controller to turn up the boost.

**BrenTuning reserves the right to deny tuning services based on an incomplete or unsafe vehicle. This will forfeit dyno time or money and diagnostic time allotted to the original tune. REMEMBER, dyno tuning time starts when the vehicle is driven into the chassis dyno cell so our goal is to make this time as effective as possible in order to make the cost to the client as little as possible. A tuner/calibrator's job is to develop a tuned calibration specific to your vehicle, not fix everything that is wrong with it. If you come to an appointment with a car that is not in proper working order you may be asked to leave depending upon the severity of the issue(s). If the problem is a minor and can be easily fixed at the shop during normal operating hours, then we can fix it, but at our normal shop rate.**

**I have read this and have completed all of these items that appeal to my platform to the best of my ability and the vehicle is ready for tuning.**

Owner's signature

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