Welcome to the Miata NB1 Intake Development github!

We aim for this project to not only be an exciting quest for performance but also a source of education for those who follow along. It will be with our best effort that we as the development team document our data, whether previously known or freshly discovered, in a format designed to be read and understood by anyone with a basic understanding of engine design concepts.

We encourage those of you following along with the project to perform experiments of your own, and apply what you discover in this database to your own projects, and if you don’t have a project, start one!

Fostering a sense of community has been, and will always be, the number one priority in every open-source project led by Stand Motor Company. We are grateful for everyone’s participation in each step of the journey, and we are honored to be involved in a step of your own.

So, with that, here are the technical guidelines:

Non-Negotiables:

Individual Throttle Bodies:

The heart of the design. If we discover that the ITB’s offer no benefit apart from the beautiful song that they sing and the stunning novelty that they offer, it will be enough.

Plenum Design:

Awesome as ITB’s are, we don’t like the idea of dirt getting sucked into your expensive racing engine through open velocity stacks. ITB air filter systems are either A) bulky, or B) restrictive, and they don’t offer the tuning benefits that a plenum design does.

Dual-Runner:

The tricky part. Ideally, the goal is to design a broadband manifold that operates well at high-RPM, and low/mid-RPM without any moving parts. However, the dual-performance nature of our intake is of a higher priority than the solid-state ideal, so we will involve whatever moving parts are necessary to achieve the broadband performance we desire.

Project Goals:

Additive Manufacturing:

We intend to fully utilize the design flexibility that 3D printing offers by designing the system in such a way that performance compromises for the sake of manufacturing are minimal. This will allow design intricacies that other manufacturing processes would not allow.

Solid-State:

Armed with this added design flexibility, we will explore the possibilities of utilizing wave reflection and intricate geometry to allow for high volumetric efficiency over a large RPM range, without additional valves.

Iteration Process:

One Range at a Time:

We are beginning this project by developing a system designed to perform well at mid-RPM with a conventional approach. We will make design changes one factor at a time until we arrive at the optimum combination of features. At this point, we move on to a high-RPM manifold design and optimize this manifold one factor at a time. After this process is complete, we will approach our broadband design equipped with the valuable data we’ve gathered along the way.

Dyno is King:

While CFD testing has its uses, design changes are not verified as beneficial or consequential until there is dyno data on that change. It is for this reason that an emphasis will be placed on designs that allow for swift component changes for increasing the value of dyno testing days.

Let’s get testing!