

## M120 Throttle Bodies

Hopefully this will serve as a rough guide and outline to the years I've been working on ITB setups on V12's. First, some quick numbers. This will be updated as needed and, more importantly, as I add stuff I forgot when I first wrote this.

- Intake port spacing: 97mm
- Intake mounting bolt size: M8
- 120mm (roughly) of clearance horizontally
- 75mm from bolt holes to top of valve cover
- 1450.5mm<sup>2</sup> Intake port area

### Throttle bodies and top square mounting flanges:

Putting this section at the top because it's the most universally applicable, regardless if you're using my flanges or not.

I built my flanges out of 1/4" (6mm) 304 Stainless with a 46mm **Bolt Pattern** and a 45mm Bore. That is, the (4) 5mm holes to hold the throttle body on is a 45mm square with a 62mm outside width. I built my own, but these conveniently are the same size as the Jenvey "universal" SFS 45mm bore throttle bodies (shown in drawing here:

[https://www.jenvey.co.uk/media/documents/drawings/SFS\\_BBW3.pdf](https://www.jenvey.co.uk/media/documents/drawings/SFS_BBW3.pdf))

These come with an injector hole (Or not, see below) and you can reach out to them with the 97mm spacing, and they will know what linkages, velocity stacks, and what fuel rail mounting will work. (**Note:** You have plenty of clearance in the lengthwise direction- There's 5mm clearance or so Sideways. If you notice, I offset my velocity stacks above the throttle body.)

This is the easiest way to get up and running with known components.

### Hayabusa throttle bodies:

This is a work in progress- At some point I'd like to have a dedicated guide of how to set these up and run as reliably as the above mentioned dedicated aftermarket throttle bodies, but it's difficult. There's a lot of caveats, the least of which is height above the manifold, non-ideal geometry, a non-standard injector hole size, a different linkage lever for almost every single body, and they look less than stellar. Furthermore, by the time you develop a reliable linkage system and buy 5 sets of bodies that will most likely at the bare minimum need to be cleaned, the \$2700 ish USD (at time of writing) for aftermarket bodies is a decent trade off for 175 hours I spent getting \$1000 worth of ebay throttle bodies *Kinda* working on a V12.

That all being said, I included an adapter that goes from the 4 bolt flange to the 46mm Gen 1 hayabusa output diameter. If you want to take the time to go through and do it, it exists. It's something I'd love to see be an easy future solution, but at the moment it's in development.

Custom Options: Reach out to <https://www.gooichimotors.com/> for all high performance or otherwise built M120's.

#### Injector Placement:

In my video for this, I put the injectors hidden under the top flange, using criss-cross injectors to custom built rails. *Do not do this.*

The intake runners with a hole in them are not included for a reason, this was a bad design. Use throttle bodies with injector holes- I have a design I'm working on for a better injector placement, but that was a huge mistake. It works, but it makes wiring and assembly and maintenance *Bad*.

#### Intake runners:

I printed these out of PAHT-CF From Bambu Labs, and have heat cycled them a few times with good results. They are a Nylon base so don't have any interactions with gasoline, and have a HDT that exceeds reasonable operating temperatures. I have these listed for sale on my website, but if you have a capable printer they print well. (If you have a X1C printer, All I did was slow Max Volumetric Speed to 2- down from 8 in the factory settings.)

The offset is identical regardless of side- that is, as long as they are pointed the same direction, they move 43.5mm over, to line up with the other side moving 43.5mm in the opposite direction.

They have seal grooves, but surface prep is still important. JB Weld PlasticWeld is a nice blend between strength, flexibility and heat resistance, but if you have a 3M product of choice it would most likely do fine. Clamp well- the Flanges will not be completely flat, and I recommend gluing and clamping so they are completely flat, so when you bolt it to the intake it's in its cured state and not introducing unnecessary stresses.

I built my set with the threads tapped into the above mentioned square flanges, but designed these with clearance for heat set inserts, linked below.

#### M120 Head mounting flange:

If you're looking at the included files, there's two. They are side dependent, and cannot be mounted any other way. The factory Mercedes gaskets work well.

I used 3/8" (9mm) 304 Stainless steel, Laser cut from SendCutSend- (affiliate link- <https://bit.ly/WesleyKagan>) Which avoids any issue with mill scale- It's worth noting that Aluminum would probably be sufficient, but as there are only 8 bolts per side holding these on, rigidity is key. The factory Mercedes intake was 30 lbs of aluminum for a reason. I found the existing surface finish of the stainless was able to get a good seal, but it's worth a careful inspection to make sure.

McMaster Parts List:

Heat set inserts for M5: 94180A361 (You need 48, So 2 spares)

M8 x 1.25 for Flanges: 98093A543 (50 is plenty, For 3/8 Fl. thickness, 25mm Long)