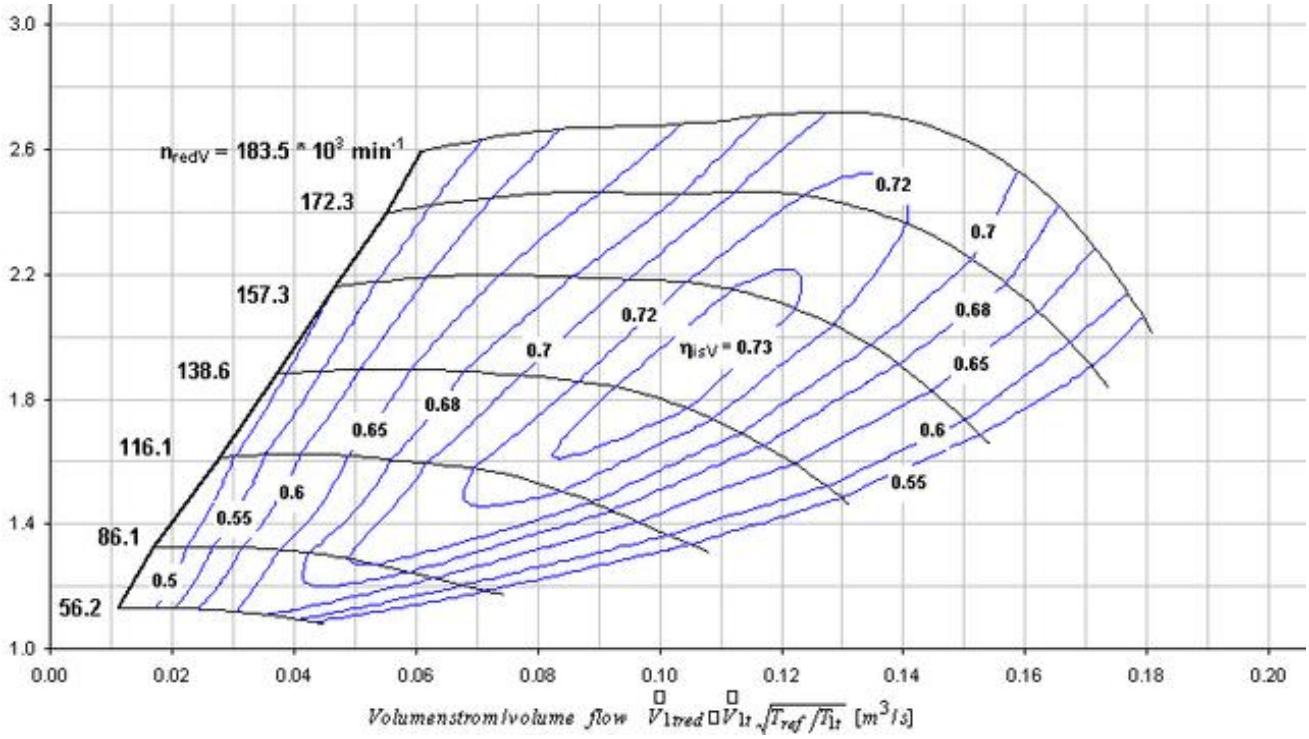
As for potential. The turbo is tapped. I posted an efficency analysis of the turbo a while back. The Turbo intakes 366 CFM. To make more horsepower you need more CFM. I dont care what your displacement is or how efficient the turbo will act as a restriction.

Mathematically, if you look at a VE analysis the more efficient a motor is the more the turbo acts as a restriction as if you go past a certain point you cross a compressor choke line in which the compressor cannot compress more air.

If you plot a K04 map on stock MS6 [or MS3] boost, the turbo is already godawful close to the choke line. A few psi more and you will stall the compressor. The turbo will create buttloads of turbulence and heat and you will most likely loose horsepower.

ACTUAL compressor map for a K04 turbo.

Pressure ratio is calculated by Absolute pressure/Atmospheric Pressure or 15.7 PSI+ 14.7 PSI/14.7 PSI



CFM need is...

CFM = (L x RPM x VE x Pr)/5660

CFM= (2.3 x 6500 x 90 x 2.068)/ 5660

CFM= 491.6

This is the minimum the turbo must flow with an engine with a 90% VE to HOLD 15.7 PSI to 6500 RPM.

As you can see at a pressure ratio of 2.068 the turbo is RIGHT on the edge of its efficiency.

The MAXIMUM this turbo can flow at a pressure ratio of 2.068 is at the right hand upper edge of the map. Which just happens to be... 0.175 cubic meters a second. This converts into around 371 CFM.

Now we have already calculated the CFM needed to hold 15.7 PSI to redline. That is 491.6 CFM at a 90% VE. This converts to 0.2320 cubic meters a second. This happens to be COMPLETELY off the chart and unattainable for this particular turbo.

This turbo is what we term Maxed Out. It is pretty close to being maxed out from the factory... No matter what you do it will NEVER efficiently support 15.7 PSI at 6500 RPM.

This is PRECISELY why boost and power drops in the upper RPM band.

0.21 kg/ sec of flow equals about 366.67 CFM at STP.