

Inputs - Click to Expand/Collapse



**MatchBot**



### Enter Engine Information (Required)

Turbo Configuration

Displacement (Liters)  (97.632 CID)

Ambient Air Temp (deg F)

Altitude (ft above sea level)  (14.502 psi barometric pressure)

Fuel Type

Required Inputs	#1	#2	#3	#4	#5	#6
Engine Speed rpm	<input type="text" value="2000"/>	<input type="text" value="3000"/>	<input type="text" value="4000"/>	<input type="text" value="5000"/>	<input type="text" value="6000"/>	<input type="text" value="7000"/>
Volumetric Efficiency %	<input type="text" value="85"/>	<input type="text" value="90"/>	<input type="text" value="95"/>	<input type="text" value="95"/>	<input type="text" value="90"/>	<input type="text" value="85"/>
Boost Pressure (Gauge) psi	<input type="text" value="4.8"/>	<input type="text" value="14.5"/>	<input type="text" value="18"/>	<input type="text" value="18"/>	<input type="text" value="18"/>	<input type="text" value="18"/>
Intercooler Effectiveness %	<input type="text" value="99"/>	<input type="text" value="95"/>	<input type="text" value="95"/>	<input type="text" value="92"/>	<input type="text" value="90"/>	<input type="text" value="90"/>
Intercooler Pressure Drop psi	<input type="text" value="0.2"/>	<input type="text" value="0.3"/>	<input type="text" value="0.4"/>	<input type="text" value="0.6"/>	<input type="text" value="0.7"/>	<input type="text" value="0.8"/>
Air Filter Restriction psi	<input type="text" value="0.08"/>	<input type="text" value="0.1"/>	<input type="text" value="0.12"/>	<input type="text" value="0.15"/>	<input type="text" value="0.18"/>	<input type="text" value="0.2"/>
Muffler System Backpressure psi	<input type="text" value="0.5"/>	<input type="text" value="1"/>	<input type="text" value="1.3"/>	<input type="text" value="1.5"/>	<input type="text" value="1.8"/>	<input type="text" value="2"/>
Compressor Efficiency %	<input type="text" value="55"/>	<input type="text" value="60"/>	<input type="text" value="67"/>	<input type="text" value="71"/>	<input type="text" value="74"/>	<input type="text" value="76"/>
Turbine Efficiency %	<input type="text" value="90"/>	<input type="text" value="83"/>	<input type="text" value="77"/>	<input type="text" value="71"/>	<input type="text" value="70"/>	<input type="text" value="70"/>
Exhaust Gas Inlet Temperature deg F	<input type="text" value="1500"/>	<input type="text" value="1600"/>	<input type="text" value="1700"/>	<input type="text" value="1700"/>	<input type="text" value="1700"/>	<input type="text" value="1700"/>
Turbine Expansion Ratio ~	<input type="text" value="1.18"/> <input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.49"/> <input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.71"/> <input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.84"/> <input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.89"/> <input type="button" value="+"/> <input type="button" value="-"/>	<input type="text" value="1.94"/> <input type="button" value="+"/> <input type="button" value="-"/>
Calculated Percentage of Wastegating %	1.91	1.58	19.06	25.64	29.98	33.91
BSFC lb/hp-hr	<input type="text" value="0.43"/>	<input type="text" value="0.45"/>	<input type="text" value="0.48"/>	<input type="text" value="0.5"/>	<input type="text" value="0.52"/>	<input type="text" value="0.55"/>
A/F Ratio ~	<input type="text" value="13"/>	<input type="text" value="12"/>	<input type="text" value="11.5"/>	<input type="text" value="11.5"/>	<input type="text" value="11.5"/>	<input type="text" value="11.5"/>

Calculated Outputs - Click to Expand/Collapse

	#1	#2	#3	#4	#5	#6
Compressor Pressure Ratio ~	1.35	2.03	2.29	2.31	2.32	2.33
Compressor Outlet Temp deg F	161.77	273.64	285.85	276.17	269.34	265.34
Intake Manifold Air Temp deg F	75.87	84.93	85.54	91.09	94.43	94.03
Intake Manifold Air Density lb/in3	0.000056	0.000083	0.000093	0.000092	0.000092	0.000092
Density Ratio (Intercooled) ~	1.33	1.96	2.2	2.18	2.16	2.16
Actual Flow Rate (Not Corrected) lb/min	4.67	10.97	17.28	21.38	24.16	26.64
Actual Flow Rate (Not Corrected) cfm	67.77	159.03	250.55	310.03	350.33	386.29
Corrected Air Flow Rate lb/min	4.69	11.03	17.4	21.58	24.44	26.98
Corrected Air Flow Rate kg/sec	0.035	0.083	0.131	0.163	0.185	0.204
Corrected Air Flow Rate kg/hr	128	300	473	587	664	733
Corrected Air Flow Rate m3/sec	0.032	0.075	0.119	0.148	0.167	0.185
1/BSAC hp-min/lb	10.7	11	10.8	10.3	9.9	9.4
Turbo Shaft Power Hp	2.31	12.43	20.79	24.54	26.79	28.94
Engine Power Hp	50.2	121.9	187.8	223.1	242.4	252.7
Engine Torque lb-ft	131.73	213.34	246.6	234.35	212.19	189.61
Fuel Requirement lb/hr	21.6	54.8	90.2	111.6	126.1	139
<b>Turbine Match Outputs</b>						
Exhaust Manifold Pressure psi	3.2	8.6	12.5	14.9	16.3	17.5
Engine Delta Pressure (dP) psi	2	6	5	3	2	0
Turbine Swallowing Parameter PHI	0.0101	0.0188	0.0214	0.0223	0.0227	0.0227
Turbine Corrected Flow @ 59F lb/min	7.3	13.5	15.3	16	16.2	16.3
Wastegate Flow Area @ CF=0.9 in2	0.01	0.01	0.22	0.34	0.42	0.51
WG Port Diameter Requirement mm	3	3	13	17	19	20

Wheel Speed Calculators (Optional) - Click to Expand/Collapse

Use this if you know Wheel Tip Speed and Wheel Diameter and would like Wheel RPM

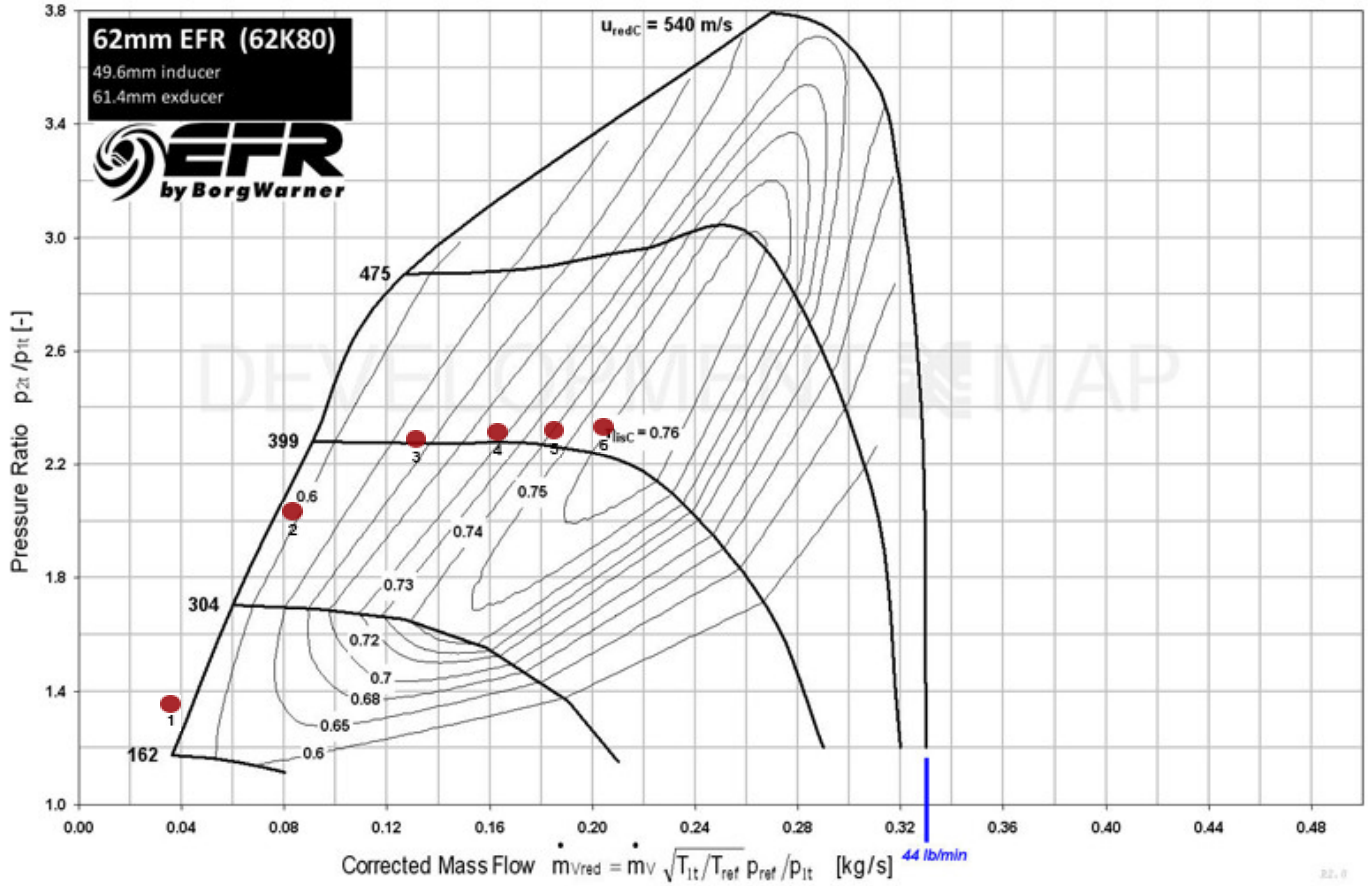
Wheel Tip Speed m/s	<input type="text" value="300"/>	<input type="text" value="320"/>	<input type="text" value="340"/>	<input type="text" value="368"/>	<input type="text" value="400"/>	<input type="text" value="400"/>
Wheel Diameter mm	<input type="text" value="83"/>	<input type="text" value="83"/>	<input type="text" value="83"/>	<input type="text" value="83"/>	<input type="text" value="83"/>	<input type="text" value="83"/>
Wheel Rotational Speed rpm	69033	73635	78238	84681	92044	92044

OR use this if you know Wheel RPM and Wheel Diameter and would like Wheel Tip Speed

Wheel Rotational Speed rpm	<input type="text" value="69033"/>	<input type="text" value="73635"/>	<input type="text" value="78238"/>	<input type="text" value="84681"/>	<input type="text" value="92044"/>	<input type="text" value="92044"/>
Wheel Diameter mm	<input type="text" value="74"/>	<input type="text" value="74"/>	<input type="text" value="74"/>	<input type="text" value="74"/>	<input type="text" value="74"/>	<input type="text" value="74"/>
Wheel Tip Speed m/s	267	285	303	328	357	357

Compressor Match - Click to Expand/Collapse

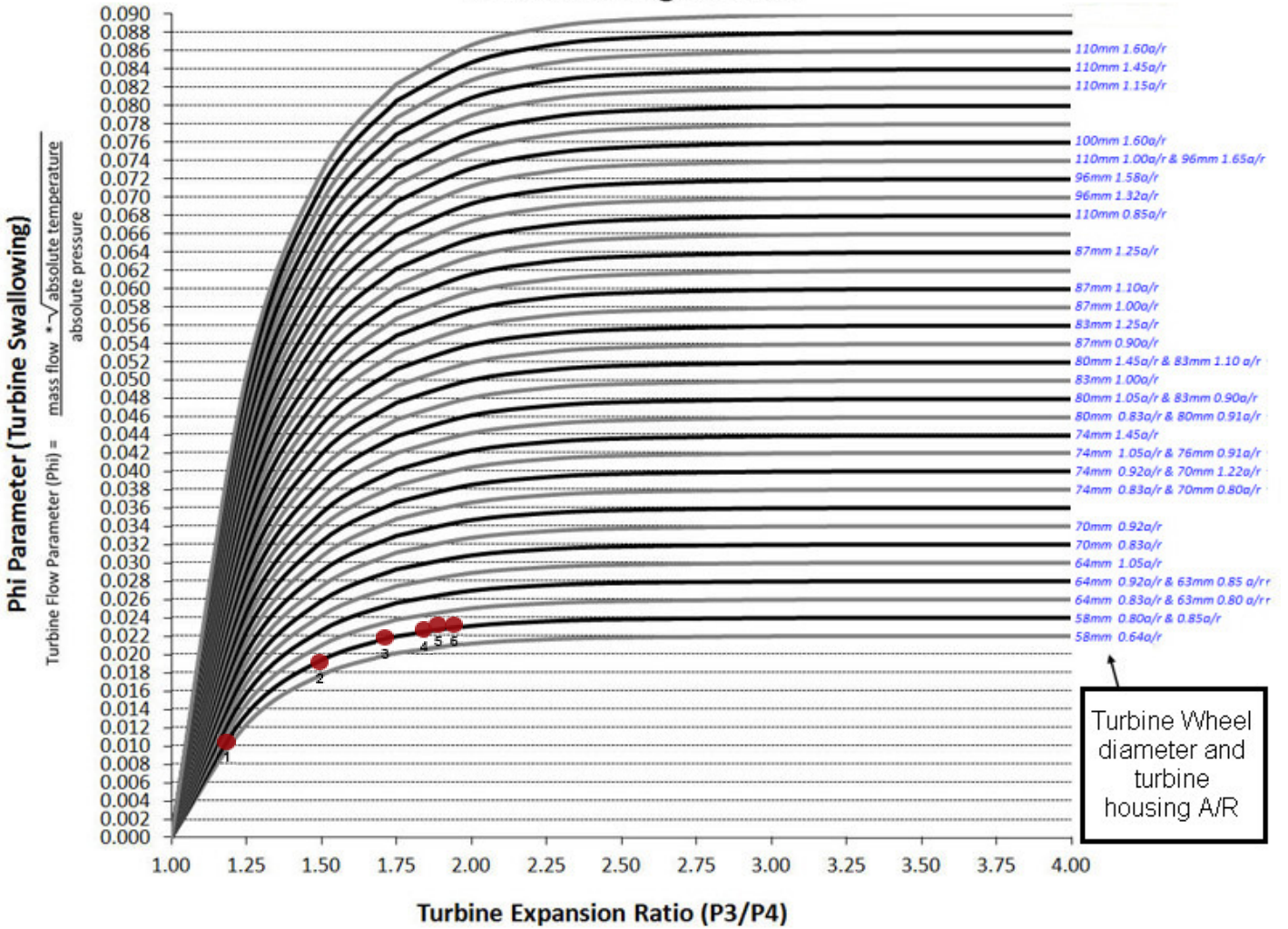
Please Select a Compressor



Turbine Map - Click to Expand/Collapse

The 5 red (wastegated) match dots must land on a single Phi curve. Tune the turbine expansion ratios until they do.

## Turbine Sizing Selector



### Tutorials and FAQs

[Segment 1 - Inputs and Numerical Outputs](#)



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[Segment 2 - Compressor and Turbine Selection \(Maps\)](#)



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[Segment 3 - Match Sizing Comparisons](#)



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[Segment 4 - Turbine Efficiency, Wheel Speeds and Saving your Work](#)



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