

Supercharger & Turbocharger Calculations

29/09/2009

Engine Capacity	1015 cc
Ambient Pressure	1000 mBara
Ambient Temperature	25 deg C
Intercooler Efficiency	80 %
Compressor Efficiency	75 %
Supercharger Efficiency	67 %
Engine Volumetric Efficiency	82 %

Turbocharger Stage

Boost Pressure	1000 mBarg	1000 mbarg is approx 14.5 psi
Rpm	6000 rpm	
Pressure Loss thro Air Filter	50 mBarg	
Compressor Inlet Pressure	950 mBara	
Compressor Inlet Temp Abs	298 Deg K	
Compressor Outlet Pressure Abs	2000 mBara	
Compressor Outlet Temp	118.2 Deg C	
Compressor Pressure Ratio	2.105	
Density Ratio	1.604	
Theo Engine Air Flow	108 CFM	
Actual Engine Air Flow nat asp	88 CFM	
	6.1 Lbs/Min	
Compressor Air Flow Turboed	141 CFM	
	9.8 Lbs/Min	

Intercooler	
Intercooler Inlet Temp	118 Deg C
Intercooler Outlet Temp	44
Intercooler Pressure Loss	75 mBar
Intercooler Density Ratio	1.189

Comp Air Flow Turboed & Int Cooled	168 CFM
	11.60 Lbs/Min

Supercharger Stage

Boost Pressure	1200 mBarg
Compressor Inlet Pressure	1925 mBara
Compressor Inlet Temp Abs	317 Deg K
Compressor Outlet Pressure Abs	3125 mBara
Compressor Outlet Temp	113.1 Deg C
Compressor Pressure Ratio	1.623
Density Ratio	1.331
Actual Engine Air Flow Sup & Int	168 CFM
	11.6 Lbs/Min
Compressor Air Flow Turb & Sup	224 CFM
	15.4 Lbs/Min

Intercooler	
Intercooler Inlet Temp	113 Deg C
Intercooler Outlet Temp	43
Intercooler Pressure Loss	75 mBar
Intercooler Density Ratio	1.194

Air Flow Super & Turboed & Int Cooled	267 CFM
	18.44 Lbs/Min
	453.22 m3/hr

Corrected Air Flow for Supercharger sizing	149.53 CFM
	10.32 Lbs/Min
	253.56 m3/hr

Approx.Power	200 hp
	147 kW
Approx.Torque	175 FtLbs