

Engine Specifications					
	Metric		Imperial		
Engine Displacement :	2.100	L	128	cu.inch	
Maximum Engine Speed :	8000	rpm			
Engine Free Airflow at Atmospheric Pressure :	0.140	m <sup>3</sup> /sec	297	cfm	
Peak Boost Pressure :	262.001	kPa	38	psi	
Engine Free Airflow at Peak Boost Pressure :	0.502	m <sup>3</sup> /sec	1064	cfm	
Inlet Air Heat Load Analysis					
Intake Air Temperature @ Air Cleaner :	24.0	°C	=	297.15	°K
Intake Air Temperature @ I.C. Inlet :	76.0	°C	=	349.15	°K
Intake Air Temperature @ I.C. Outlet :	2.0	°C	=	275.15	°K
Intake Air Flowrate :	30.1	m <sup>3</sup> /min	=	0.50200	m <sup>3</sup> /sec
Atmospheric Air Pressure :	101.325	kPa	=	14.696	psi
Intake Air Density :	0.84167	m <sup>3</sup> /kg			
Intake Air Mass Flowrate :	0.59644	kg/sec			
Intake Air Enthalpy @ I.C. Inlet :	350.372	kJ/kg			
Intake Air Enthalpy @ I.C. Outlet :	276.113	kJ/kg			
Required Heat Transfer to I.C. Dry Ice :		kW	=		hp
			=		BTU/min
Constant Pressure Specific Heat of Air :	1.0035	kJ/(kg.K)			
Atmospheric Pressure :	101.325	kPa			

Intercooler Structure Design							
Tube Data							
Tube Width :	148.000	mm					
Tube Depth :	8.200	mm					
Tube Cross-sectional Area :		mm <sup>2</sup>					
Tube Surface Area per Lineal Metre :		mm <sup>2</sup>					
Fin Data							
Fin Thickness :	0.000	mm					
Fin Spacing :	0.0	fpi					
Fin Pitch :	8.2	mm					
Intercooler Structure Size							
Intercooler Core Height :	250	mm					
Intercooler Core Length :	280	mm					
Number of Tubes per Core :	15						
Total Cross-sectional Area for Charge Airflow :		m <sup>2</sup>			Equivalent Diameter :	117.7	mm
Total Tube Surface Area for Charge Airflow Contact :		m <sup>2</sup>					
Number of Fins per Length of Tube :	0.0						
Fin Length :	#DIV/0!	mm					
I.C. Core Fin Gap Cross-sectional Area :		mm <sup>2</sup>					
I.C. Core Airflow Cross-sectional Area :	#DIV/0!	mm <sup>2</sup>					

I.C. Air Speed					
Intercooler Plumbing Pipe Diameter :	2.5	inches	63.5	mm	
Pipe Wall Thickness :	2.0	mm			
Number of Inlet Pipes :	1				
Total Pipe Cross-sectional Area :	2780.5	mm <sup>2</sup>		0.002781	m <sup>2</sup>
Air Temperature (Post Turbo) :	76.0	°C		349.15	°K
Air Flowrate (Post Turbo) :	0.140	m <sup>3</sup> /sec		140.00	L/sec
Air Velocity (Post Turbo) :	50.351	m/sec		181.26	km/hr
Reynold's Number :	135783	Turbulent			
Tube Surface Roughness, E :	0.0150	mm			
Inlet Pipe Length :	2000	mm			
Friction Factor, f :	0.018	0.016			
Head Loss :	74.506	m.N/N			
Pressure Drop :	3214.003	Pa			
Total Pressure Drop :	0.466	psi			
Inlet Pipe to I.C. Core Cross-sectional Area Ratio :	3.910				
Air Velocity Through I.C. Core :	12.877	m/sec		46.36	km/hr
Time one charge air molecule spends in the core :	0.022	sec.			