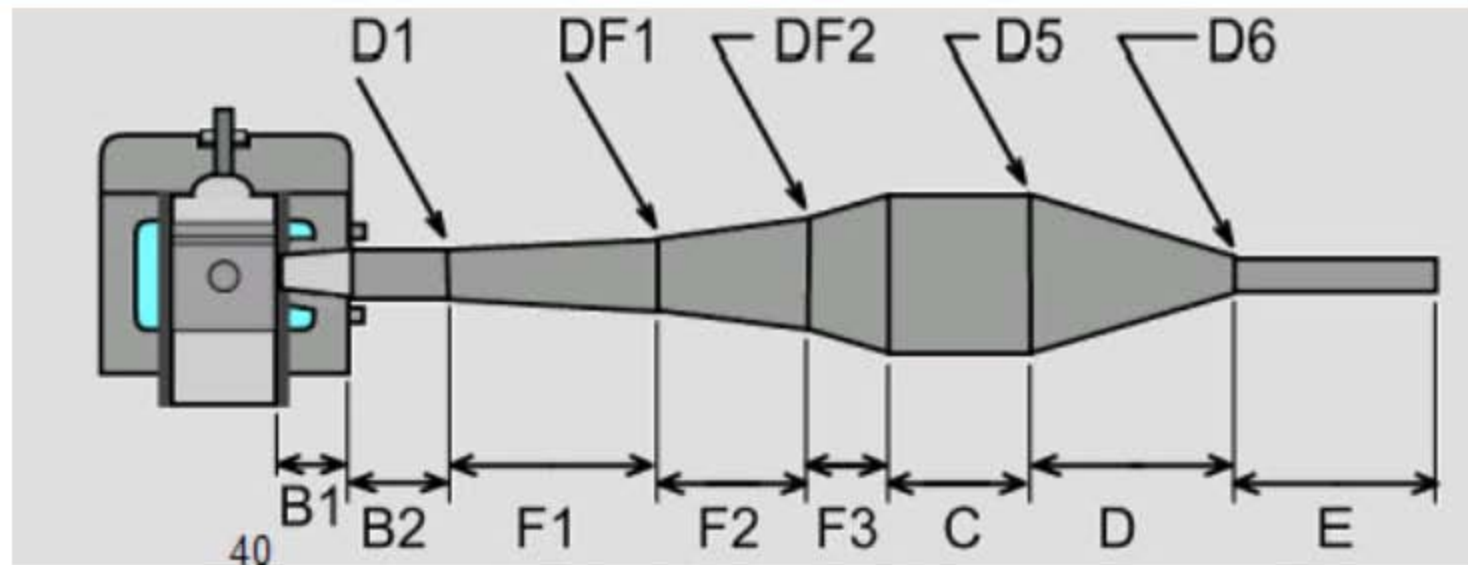


# 3-Stage Adiabatic Expansion Chamber Design



- B1+B2: 31.3 mm
- F1: 200.5 mm
- F2: 138.4 mm
- F3: 104.3 mm
- C: 155.3 mm
- D: 249.2 mm
- E: 224.2 mm
- D1: 36.5 mm
- DF1: 63.5 mm
- DF2: 105.1 mm
- D5: 136.6 mm
- D6: 19.1 mm

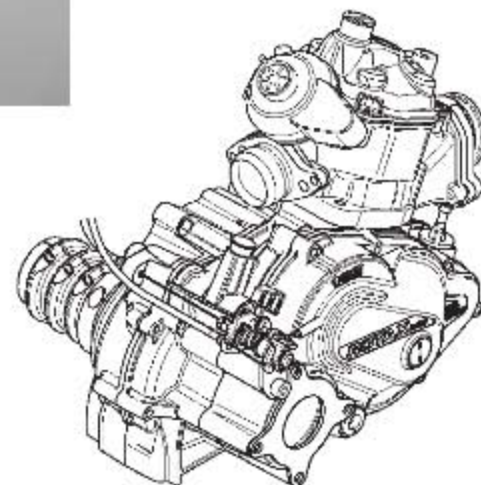
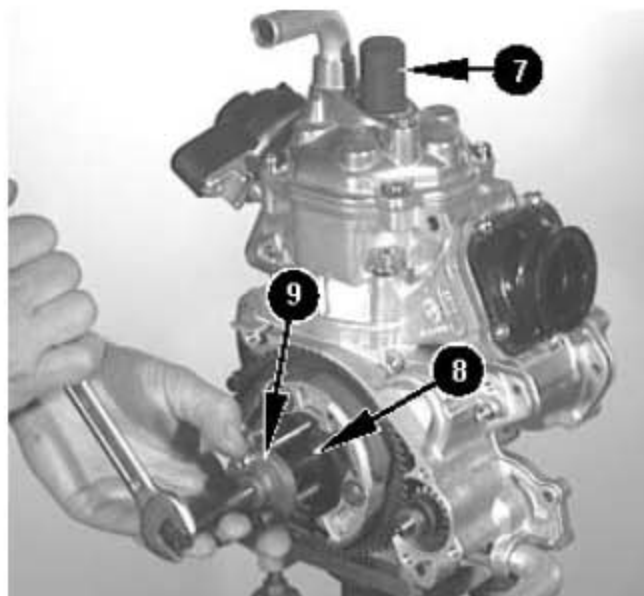
- BHP: 156.0 bhp @ 17,900 rpm
- BSFC: 0.55 lbm/hp-hr @ 17,900 rpm
- Max Cylinder Pressure: 2,377 psi @ 17,900 rpm @ CR=6.0  
(Stock FR125: 1,379 psi @ 28.2 bhp & 11,500 rpm, CR=14.8)

System Analysis Tool: "GT-Suite" by Gamma Technologies

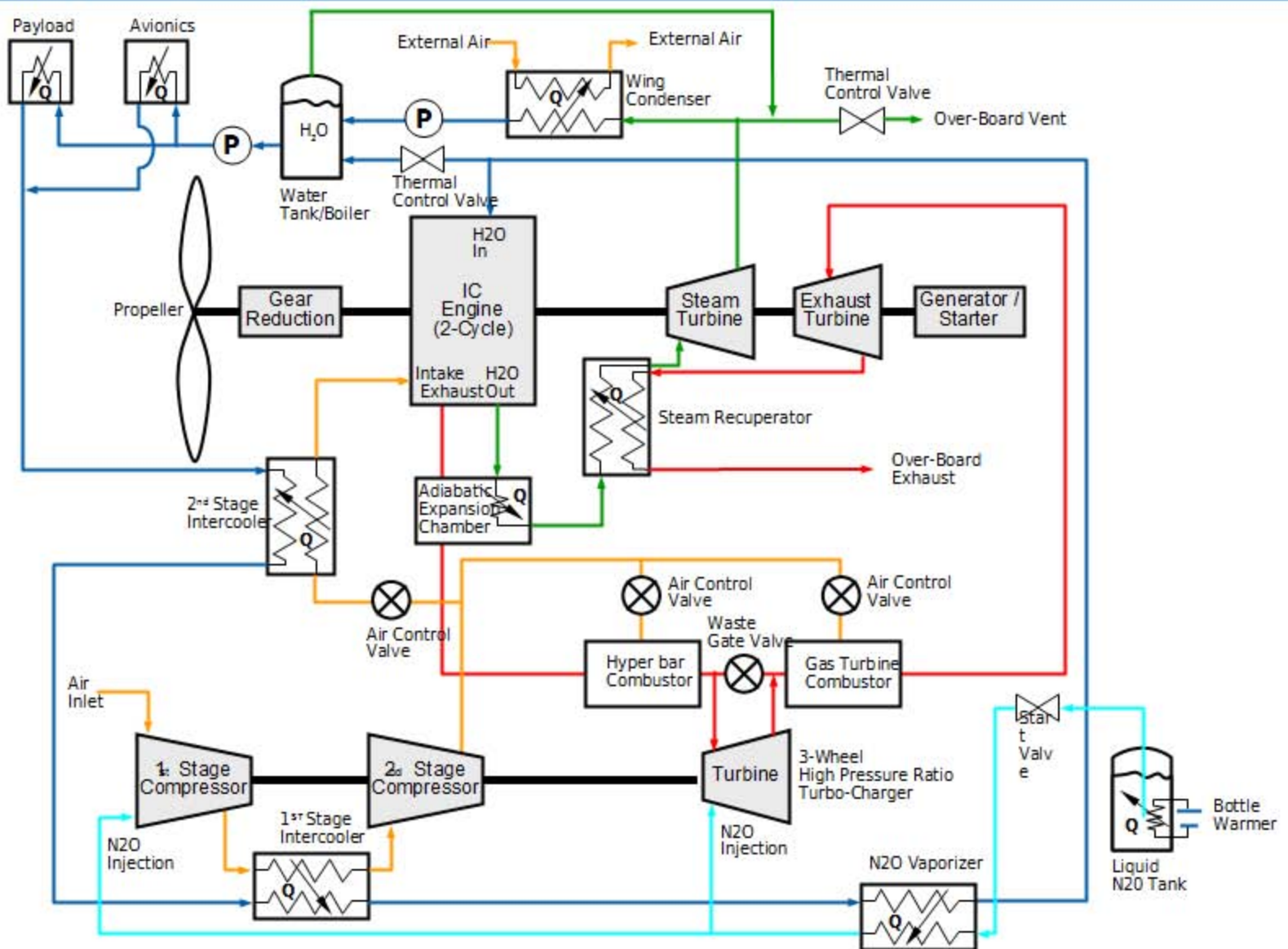
# Rotax FR125 Max Modified COTS IC Engine



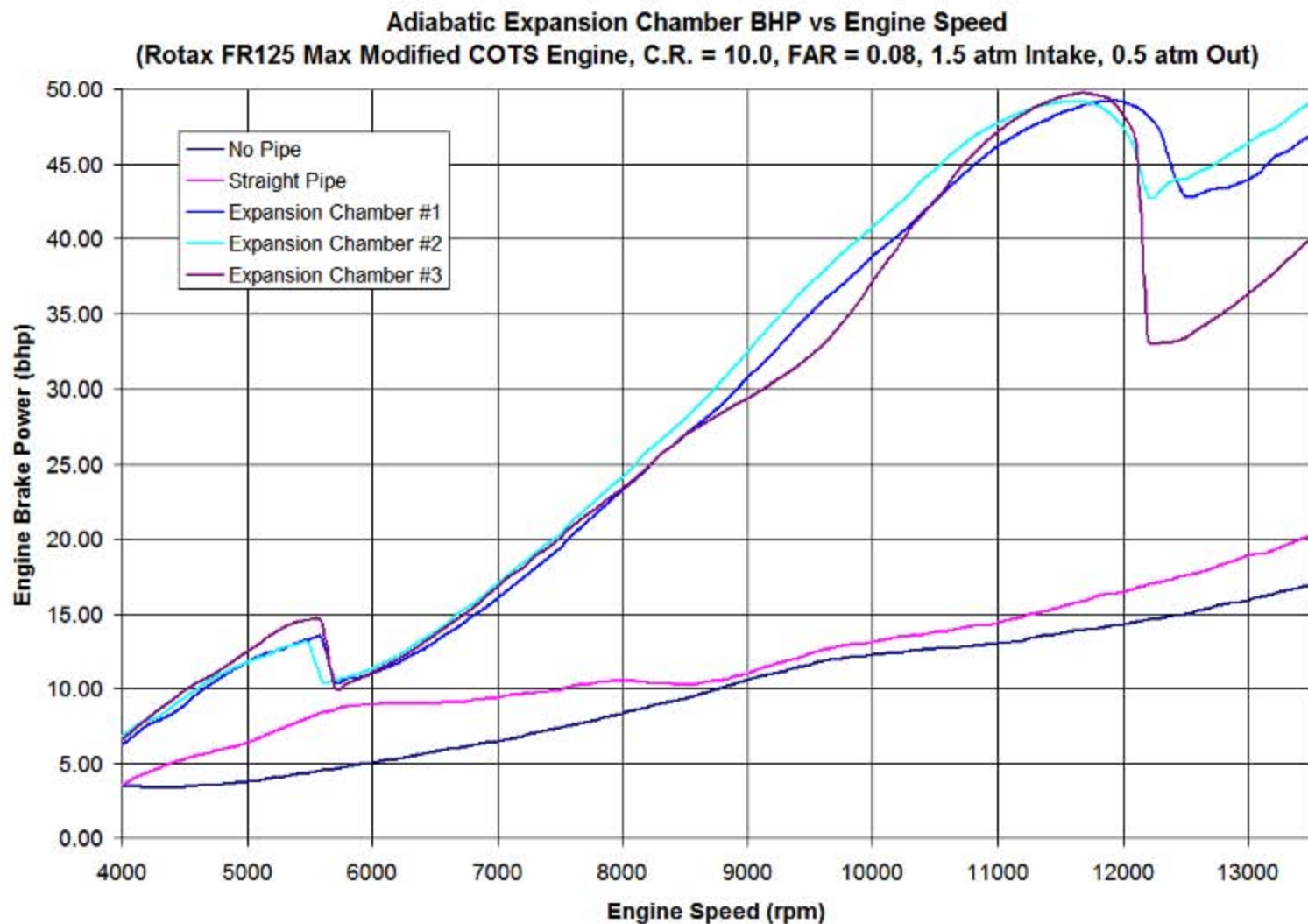
Perfect for people with kart racing experience as well as ambitious leisure karters.



# Propulsion System Schematic Overview



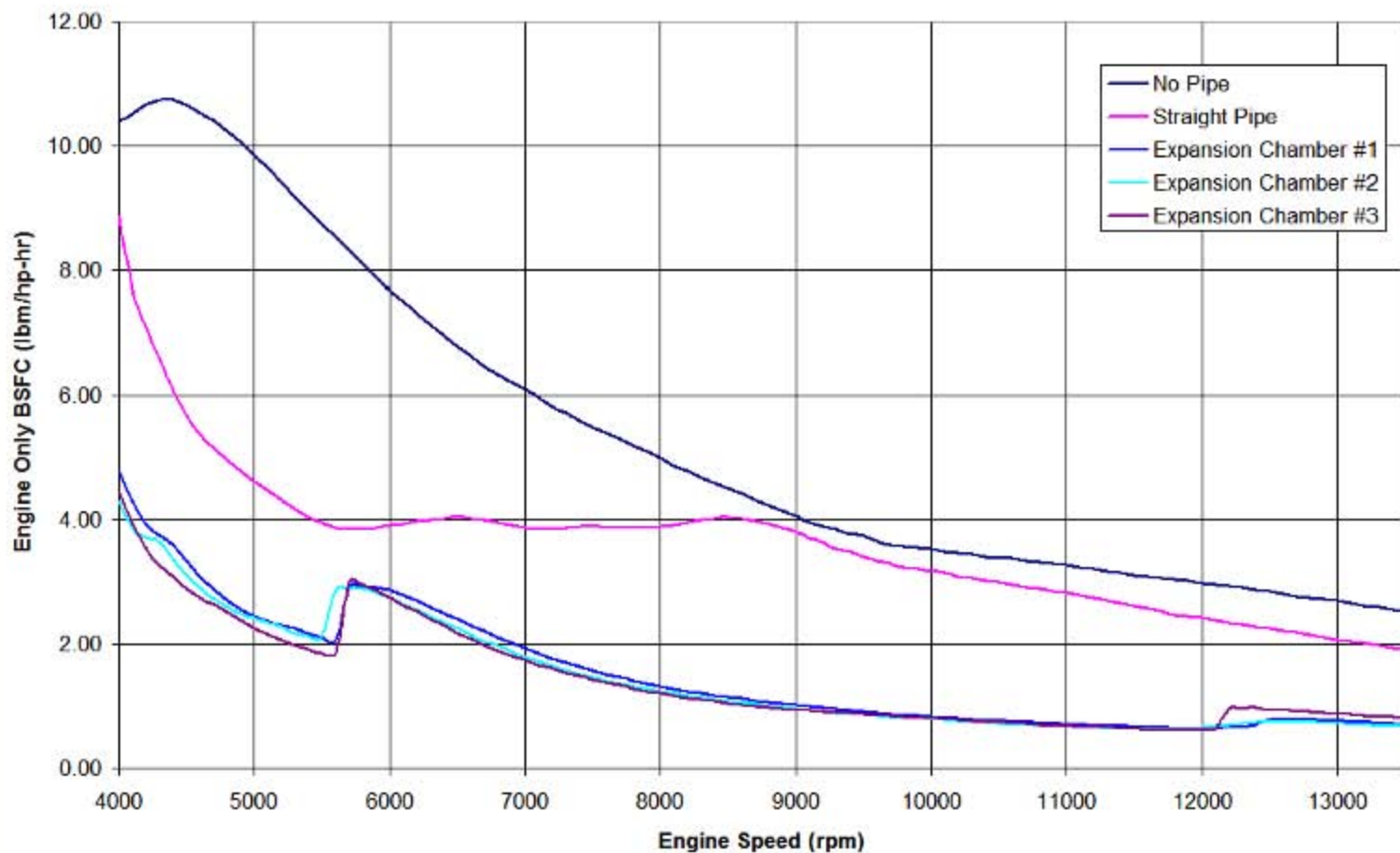
# Expansion Chamber BHP Comparison:





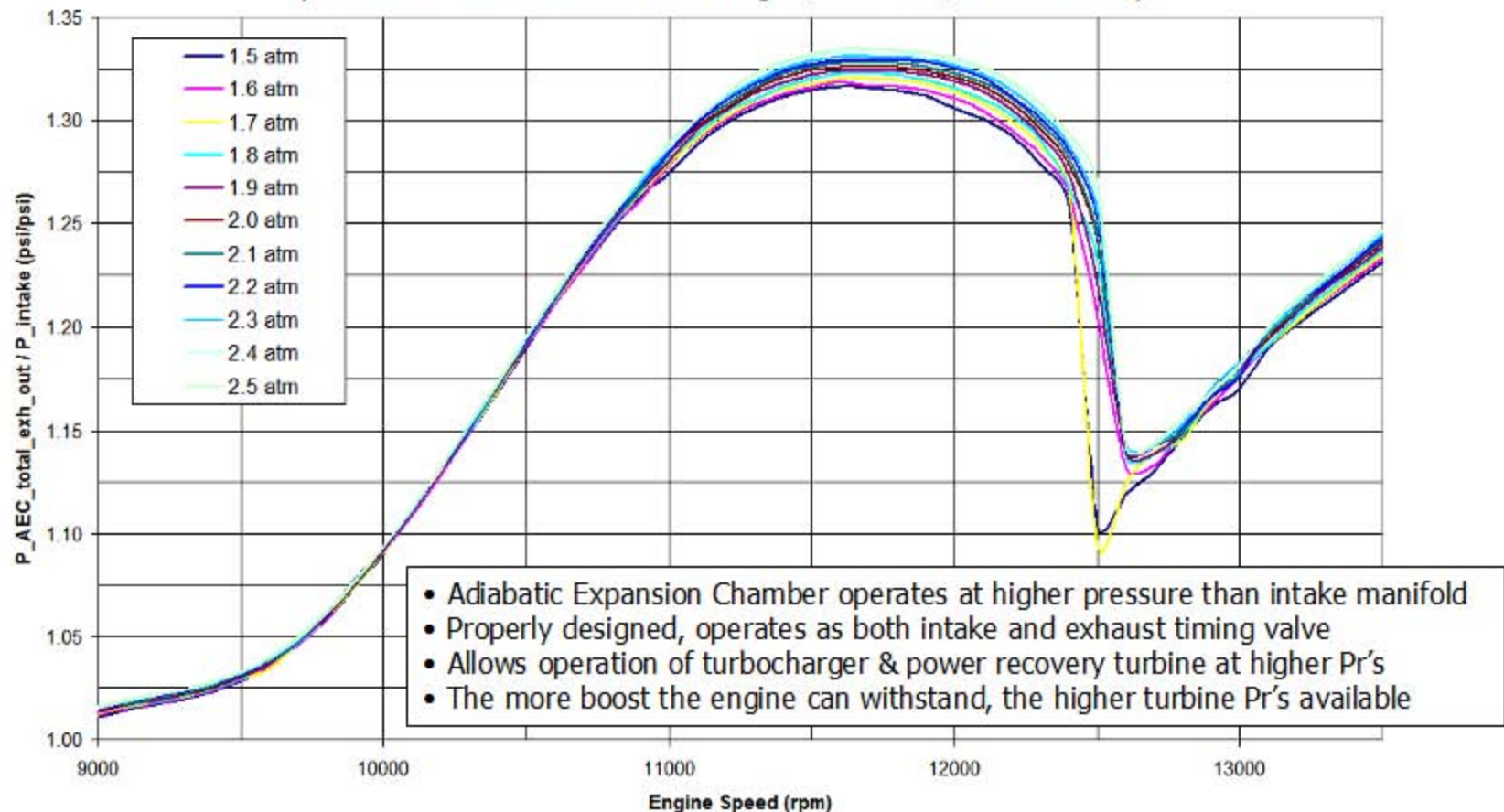
# Expansion Chamber BSFC Comparison:

Adiabatic Expansion Chamber BSFC (Engine Only) vs Engine Speed  
(Rotax FR125 Max Modified COTS Engine, C.R. = 10.0, FAR = 0.08, 1.5 atm Intake, 0.5 atm Out)



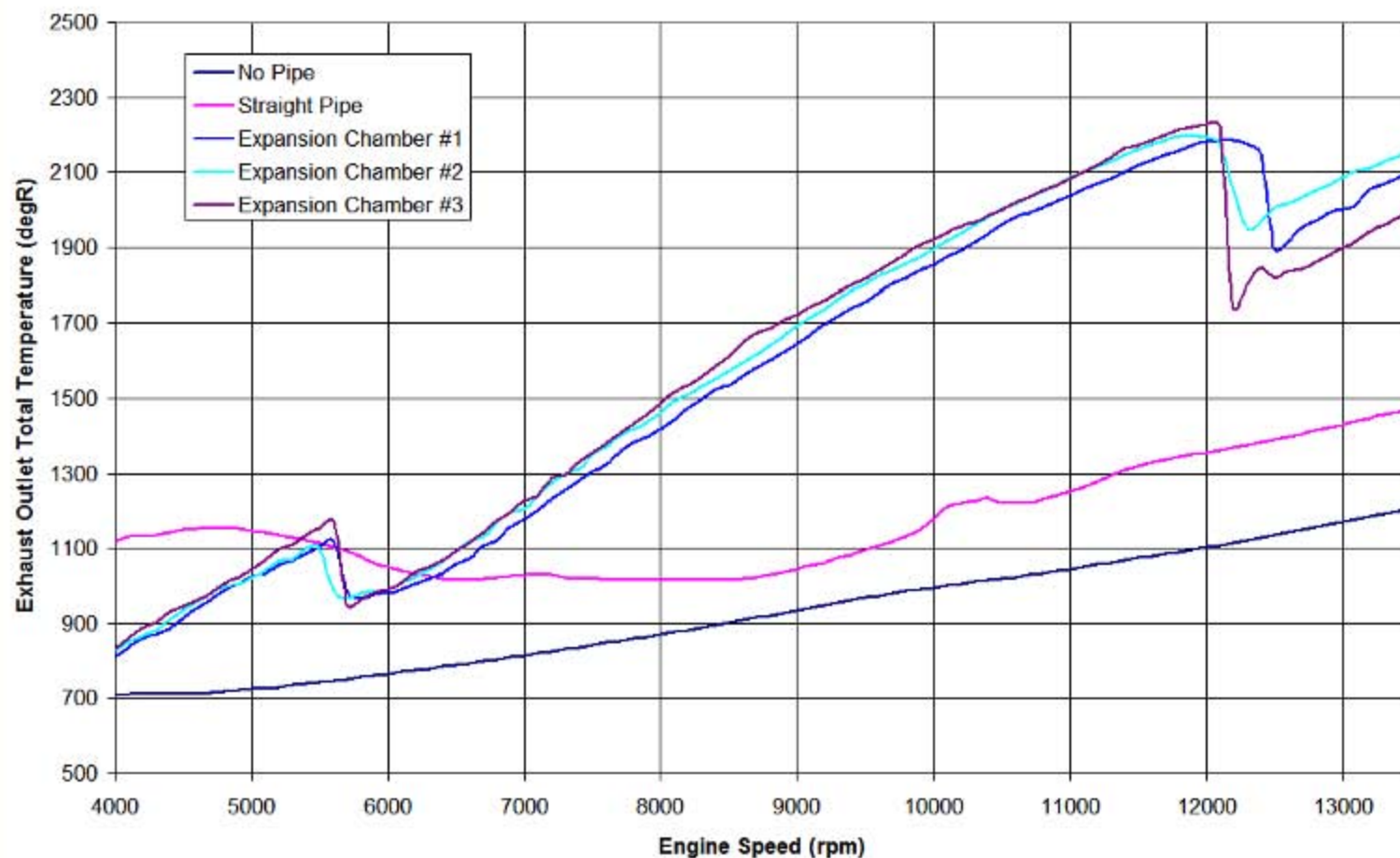
# AV Engine Exhaust-to-Intake Pressure Ratio:

**RapidEye Turbo-Prop w/ IC Engine Power Assist Combustor:  
Adiabatic Expansion Chamber Exh. Outlet Total Press. to Intake Press. Ratio vs Engine Speed  
& Intake Manifold Abs. Press. @ 70 kft  
(Rotax FR125 Max Modified COTS Engine, C.R. = 9.0, FAR = 0.06618)**

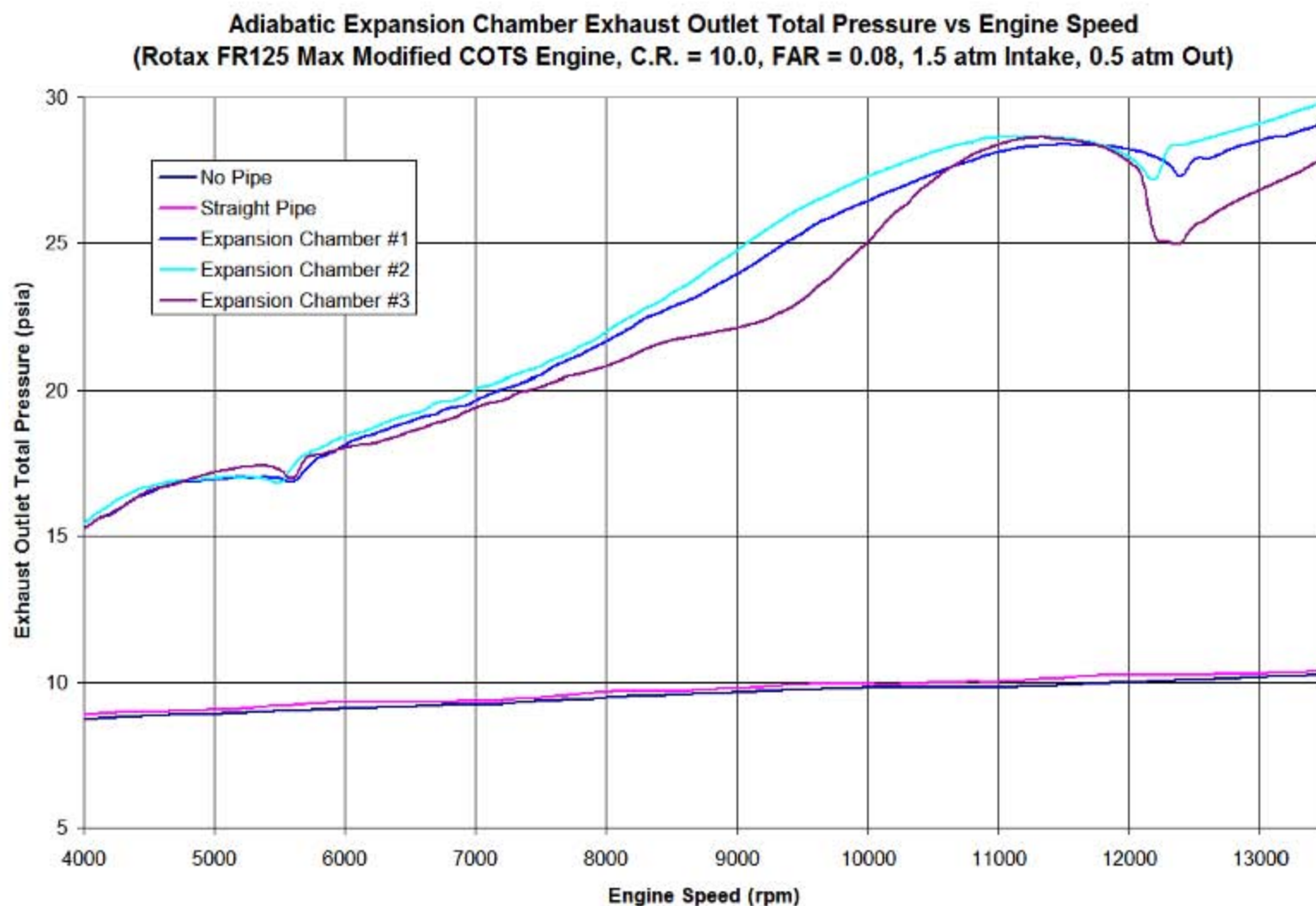


# Expansion Chamber Exhaust Outlet $T_{total}$ Comparison:

Adiabatic Expansion Chamber Exhaust Outlet Total Temperature vs Engine Speed  
(Rotax FR125 Max Modified COTS Engine, C.R. = 10.0, FAR = 0.08, 1.5 atm Intake, 0.5 atm Out)

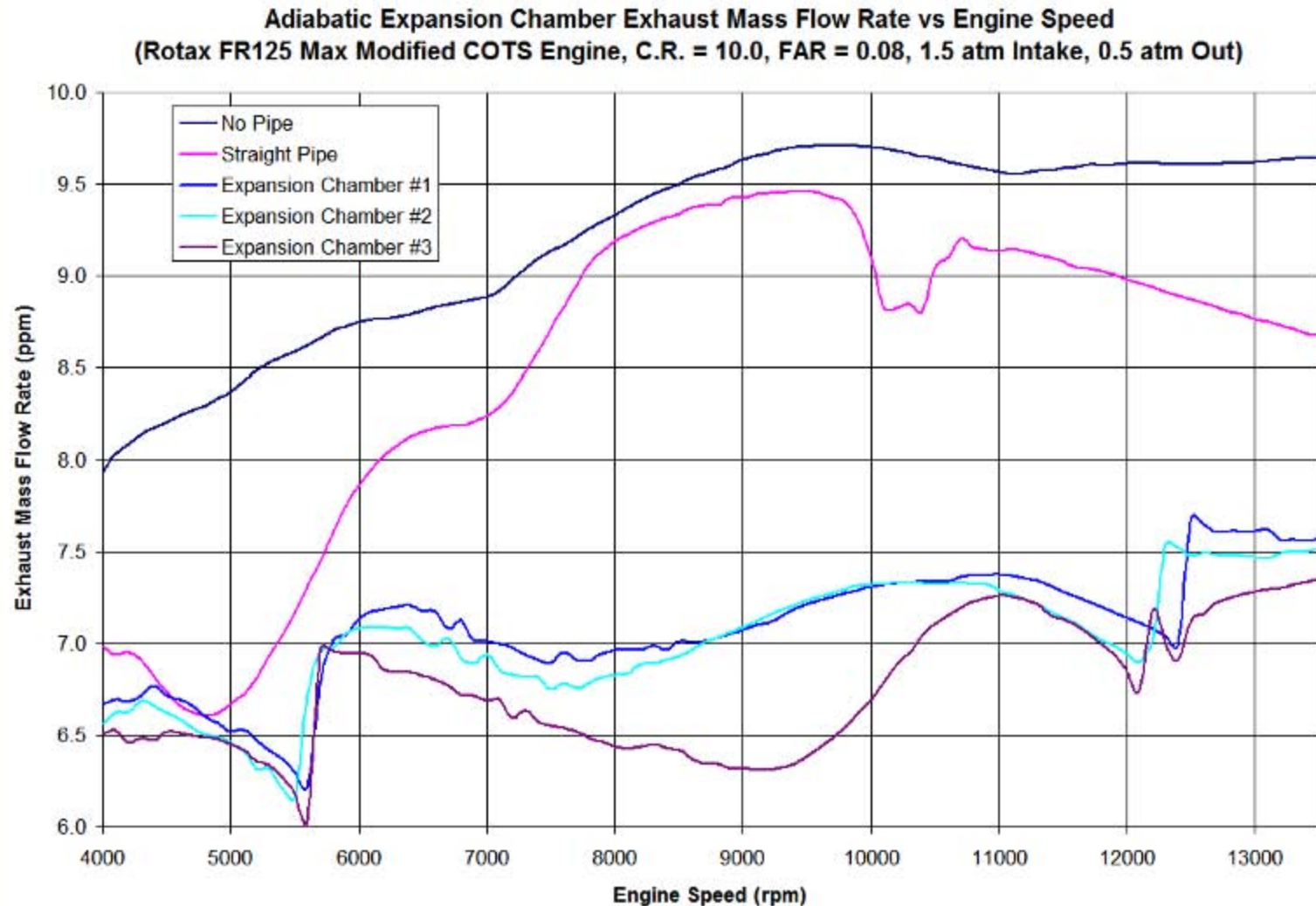


# Expansion Chamber Exhaust Outlet P<sub>total</sub> Comparison:





# Expansion Chamber Exhaust Outlet Mdot Comparison:



# Expansion Chamber Exhaust Turbine Power Comparison:

Expansion Chamber Available Exhaust Turbine Power vs Engine Speed @ 70 kft & Eff=0.80  
(Rotax FR125 Max Modified COTS Engine, C.R. = 10.0, FAR = 0.08, 1.5 atm Intake, 0.5 atm Out)

