

**AFR, Detonation, and Power.**

**Wide open throttle 100+KPA**

	Notes	Characteristics
8:1	Fuel vaning	Dangerous to motor extreme fuel vaning, excessive piston ring wear, valve wear, catalytic convertor damage, and backfire damage.
9:1	Fuel Vaning begins to occur	Increased wear on piston rings, spark plugs, and catalytic convertor.
10:1	Overboost safety AFR	Very detonation proof AFR, power 20% off, plug fowling likely.
11:1		
11.5:1	Recommended AFR for normal boost settings	Good detonation prevention, and 1-5% off maximum power
12:1		
12.6:1	Maximum power	Moderate detonation prevention, and maximum power.
13:1		
13.5:1	Lean Max torque	Little detonation prevention, and 2-8% off maximum power
14:1		Power down, detonation likely
14.5:1		
14.7:1	Stoich	Beginning of extreme danger area
15:1		Engine facing catastrophic failure from detonation/pre ignition
15.3:1	Maximum fuel efficiency	Engine facing catastrophic failure from detonation/pre ignition
16:1		Engine facing catastrophic failure from detonation/pre ignition
17:1	Lean burn technologies	Melted valves, pistons, cylinder walls, heads, valve guides, headers, etc.

**Cruise 50-80KPA (Performance)**

	Notes	Characteristics
8:1	Fuel vaning	Dangerous to motor extreme fuel vaning, excessive piston ring wear, valve wear, catalytic convertor damage, and backfire damage.
9:1	Fuel Vaning begins to occur	Catalytic convertor damage, plug fouling, and piston ring damage.
10:1		Poor all around performance
11:1		Poor fuel economy throttle response is improving
11.5:1	Rich maximum Power	Increasing throttle response, and fuel economy
12:1		Increasing throttle response, and fuel economy
12.6:1	Maximum power	Maximum throttle response, and increasing fuel economy
13:1		Decreasing throttle response, and increasing fuel economy
13.5:1	Lean Maximum power	Decreasing throttle response, and increasing fuel economy
14:1		Decreasing throttle response, and increasing fuel economy
14.5:1		Decreasing throttle response, and increasing fuel economy
14.7:1	Stoich	Decreasing throttle response, and increasing fuel economy
15:1		Decreasing throttle response, and increasing fuel economy
15.3:1	Maximum fuel efficiency	Decreasing throttle response, and increasing fuel economy
16:1		Decreasing fuel economy and throttle response
17:1	Lean burn technologies	Decreasing fuel economy and throttle response

**Cruise 50-80KPA (Economy)**

	Notes	Characteristics
8:1	Fuel vaning	Unusable
9:1	Fuel Vaning begins to occur	Unusable
10:1		Poor all around performance
11:1		Poor fuel economy throttle response begins to increase
11.5:1		Increasing throttle response, and fuel economy
12:1		Increasing throttle response, and fuel economy
12.6:1	Maximum power	Increasing throttle response, and fuel economy
13:1		Decreasing throttle response, and increasing fuel economy
13.5:1	Lean Max torque	Decreasing throttle response, and increasing fuel economy
14:1		Decreasing throttle response, and increasing fuel economy
14.5:1		Decreasing throttle response, and increasing fuel economy
14.7:1	Stoich	Decreasing throttle response, and increasing fuel economy
15:1		Decreasing throttle response, and increasing fuel economy
15.3:1	Maximum fuel efficiency	Decreasing throttle response, and increasing fuel economy
16:1		Decreasing fuel economy and throttle response
17:1	Lean miss fire likely	Decreasing fuel economy and throttle response

**Idle 30-60 KPA**

	Notes	Characteristics
8:1	Fuel vaning	Unusable rolling idle, missing fouling plugs, piston ring wear, cat damage
9:1	Fuel Vaning begins to occur	Unusable rolling idle, missing fouling plugs, piston ring wear, cat damage
10:1	Overboost safety AFR	Unusable
11:1		Cold start enrichment range begins (T<-10°C) (STARTING WATER TEMP)
11.5:1	Recommended AFR for normal boost settings	-10< T <10 °C
12:1		10°C<T<20 °C
12.6:1	Maximum power	20<T<30 °C
13:1		Begin of normal idle range
13.5:1	Lean Max torque	
14:1		
14.5:1		
14.7:1	Stoich	
15:1		
15.3:1	Maximum fuel efficiency	Optimal idle value
16:1		End of normal idle range
17:1	Lean mis fire likely	