Typical Ignition Timing Figures for Initial Setup

Naturally Aspirated Piston Engines W/ Pent roof Combustion Chamber

Ignition Timing

LOAD IN KPA									
L	**100**	15	22	32	33	33	33	33	33
O	**90**	15	22	33	34	34	34	34	34
A	**80**	15	22	33	35	35	35	35	35
D	**70**	15	23	35	35	35	35	36	36
	60	15	24	35	35	36	36	37	37
I	**50**	15	24	35	35	36	36	37	37
N	**40**	15	24	37	37	38	39	40	40
	30	15	24	37	37	38	39	40	40
K	**20**	15	25	40	45	45	45	45	45
P	**10**	15	25	40	45	45	45	45	45
A		**1000**	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**8000**

RPM

Turbocharged Piston Engines W/ Pent roof Combustion Chamber

Ignition Timing

LOAD IN KPA									
L	**300**	11	14	23	23	24	24	24	24
O	**275**	11	15	24	24	25	25	25	25
A	**250**	11	15	24	24	26	26	26	26
D	**225**	11	16	24	26	27	27	27	27
	200	12	17	26	27	27	27	27	27
	175	12	19	28	29	29	29	29	29
I	**150**	12	20	29	30	30	30	30	30
N	**125**	12	20	30	30	31	31	31	31
	100	15	22	32	33	33	33	33	33
K	**75**	15	23	35	35	35	35	36	36
P	**50**	15	24	35	35	36	36	37	37
A	**25**	15	25	40	45	45	45	45	45
		1000	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**8000**

RPM

Naturally Aspirated Piston Engines W/Wedge Combustion Chamber

	Load (kPa)				Ignition Timing				
L	**100**	15	22	32	35	35	35	35	35
O	**90**	15	22	33	35	35	35	35	35
A	**80**	15	22	34	35	35	35	35	35
D	**70**	15	23	34	35	36	36	37	37
	60	15	24	35	35	36	36	37	37
I	**50**	15	24	35	35	36	36	37	37
N	**40**	15	24	37	37	38	39	40	40
	30	15	24	37	39	39	39	40	40
K	**20**	15	25	40	47	47	47	47	47
P	**10**	15	25	40	47	47	47	47	47
A		**1000**	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**8000**
					RPM				

Turbocharged Piston Engines W/Wedge Combustion Chamber

	Load (kPa)				Ignition Timing				
L	**300**	11	14	23	23	24	24	24	24
O	**275**	11	15	24	24	25	25	25	25
A	**250**	11	15	24	24	26	26	26	26
D	**225**	11	16	24	26	27	27	27	27
	200	12	17	26	27	27	27	27	27
	175	12	19	29	30	30	30	30	30
I	**150**	12	20	30	31	31	31	31	31
N	**125**	12	20	32	32	33	33	33	33
	100	15	22	34	35	35	35	35	35
K	**75**	15	23	34	35	36	36	37	37
P	**50**	15	25	40	47	47	47	47	47
A	**25**	15	25	40	47	47	47	47	47
		1000	**2000**	**3000**	**4000**	**5000**	**6000**	**7000**	**8000**
					RPM				

Effect of Mixture (λ) on Ignition Timing

Generally speaking, air/fuel mixtures that are lower than stoichiometric ($\lambda<1$) require less ignition timing due to their higher burning speed and, consequently, shorter ignition delay time. The converse is true of leaner mixtures.

Engine Mechanical Limitations and use of the RPM Limiter

The AEM PEMS has an engine speed limiter that can be used to limit engine speed or as a “two step” limiter. This function limits engine speed based on the RPM selected by the tuner.

Depending on the preferences of the engine tuner or builder, there are several ways to limit engine speed. These include fuel cut, ignition cut, or fuel and ignition cut. With this function, a two-step limiting strategy can be used for drag racing applications. This set up uses a clutch-activated switch to detect when the clutch pedal is depressed and limits the engine to a secondary RPM that is defined by the user. At the starting line, the engine is held to that RPM until the clutch is released. Upon release of the clutch, the primary RPM setting is used for the RPM limit function.