



# Tuning Guide ver.2

**INCORRECT IGNITION TIMING CAN CAUSE ENGINE DAMAGE!!** If possible, have your ignition timing tuned by a professional on a steady state dynamometer. Too much timing advance can cause detonation. Detonation at full throttle can sound like pinging. Detonation at part throttle is much more difficult to detect. It can sound like a rattle or like valve train noise. Detonation WILL cause engine damage over time. If any detonation is heard, immediately reduce timing advance. Always leave a margin of safety. Be conservative, protect the engine. Again, get expert help.

Optimizing ignition timing can increase torque and horsepower and also increase efficiency and fuel economy. The Progression Ignition distributor and app gives you a great deal of control over your timing. You can command any timing within the range of 10-50 degrees BTDC at any RPM or load. The distributor will interpolate smoothly between adjacent cells on the table. Here are some tips on tuning the various engine operating conditions. **Every engine is different. These are general tips for most classic American V8 engines.**

## 1. Cranking transition

- a. The distributor always cranks at 10 degrees BTDC up to about 300 RPM. When transitioning to the timing table, the cells shown below are usually the first to be used. Edit these cells for best starting. Make these cells the same as idle timing for engines with low vacuum.

	Unnamed Table											Rev Limit: 5500		Pro80000
101	10	10	14	17	21	25	29	32	36	36	36	36		
94	10	16	14	17	21	25	29	32	36	36	36	36		
86	10	16	14	17	21	25	29	32	36	36	36	36		
79	10	16	14	17	21	25	29	32	36	36	36	36		
71	10	16	16	19	23	27	31	34	38	38	38	38		
64	21	16	17	20	24	28	32	35	39	39	39	39		
57	21	16	18	21	25	29	33	36	40	40	40	40		
49	21	16	19	22	26	30	34	37	41	41	41	41		
42	21	16	20	23	27	31	35	38	42	42	42	42		
34	21	16	22	25	29	33	37	40	44	44	44	44		
27	21	16	23	26	30	34	38	41	45	45	45	45		
20	21	16	24	27	31	35	39	42	46	46	46	46		
...	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500		

## 2. Idle tuning

- The Idle column is the second column from the left and the bubble should be on this column or just to the left of it.
- Maximum torque at idle can be up to 25-30 degrees. Typically idle timing is between 10-18 degrees. This creates a torque reserve. You can use that reserve by increasing advance to help maintain a smooth idle when engine load increases. Examples of increasing load would be shifting an automatic transmission from Park into Drive or turning on an accessory like air conditioning.
- The Generator in the app sets this up for you automatically. If engine load increases, RPM will decrease and the table increases timing to increase torque and compensate for the additional load. See below.

	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500
101	10	10	14	17	21	25	29	32	36	36	36	36
94	10	16	14	17	21	25	29	32	36	36	36	36
86	10	16	14	17	21	25	29	32	36	36	36	36
79	10	16	14	17	21	25	29	32	36	36	36	36
71	10	16	16	17	21	25	29	32	36	36	36	36
64	21	16	17	22	25	29	33	37	40	44	44	44
57	21	16	18	22	25	29	33	37	40	44	44	44
49	21	16	19	22	25	29	33	37	40	44	44	44
42	21	16	20	22	25	29	33	37	40	44	44	44
34	21	16	22	25	29	33	37	40	44	44	44	44
27	21	16	23	26	30	34	38	41	45	45	45	45
20	21	16	24	27	31	35	39	42	46	46	46	46

- Tip-In-** this is the area of the table that is used when increasing throttle to accelerate from a stop. The engine will quickly move through this area. Optimizing timing here can increase torque quickly and provide great throttle response.

- You want maximum torque here. Timing can go as high as 25-30 degrees. If MAP keeps increasing, timing must taper back down. See below

	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500
101	10	10	14	17	21	25	29	32	36	36	36	36
94	10	16	14	17	21	25	29	32	36	36	36	36
86	10	16	14	17	21	25	29	32	36	36	36	36
79	10	16	14	17	21	25	29	32	36	36	36	36
71	10	16	16	19	23	27	31	35	38	42	42	42
64	21	16	17	20	24	28	32	36	40	40	40	40
57	21	16	18	21	25	29	33	36	40	40	40	40
49	21	16	19	22	26	30	34	37	41	41	41	41
42	21	16	20	23	27	31	35	38	42	42	42	42
34	21	16	22	25	29	33	37	40	44	44	44	44
27	21	16	23	26	30	34	38	41	45	45	45	45
20	21	16	24	27	31	35	39	42	46	46	46	46

**4. Cruise-** Optimizing timing during cruise will maximize fuel economy. Cruise RPM varies widely due to the variety of transmissions and rear end ratios. Timing is generally in the 35-45 degree range, perhaps higher on engines with older cylinder head designs combined with non-overdrive transmissions. See below.

	Unnamed Table												Rev Limit: 5500	Pro80000
101	10	10	14	17	21	25	29	32	36	36	36	36		
94	10	16	14	17	21	25	29	32	36	36	36	36		
86	10	16	14	17	21	25	29	32	36	36	36	36		
79	10	16	14	17	21	25	29	32	36	36	36	36		
71	10	16	16	19	23	27	31	34	38				38	
64	21	16	17	20	24	28	32	35	39				39	
57	21	16	18	21	25	29	33	36	40	40	40	40		
49	21	16	19	22	26	30	34	37	41	41	41	41		
42	21	16	20	23	27	31	35	38	42	42	42	42		
34	21	16	22	25	29	33	37	40	44	44	44	44		
27	21	16	23	26	30	34	38	41	45	45	45	45		
20	21	16	24	27	31	35	39	42	46	46	46	46		
***	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500		

**5. Wide Open Throttle-** Optimize timing for maximum power. Older small block V8's typically see max power at 34-36 degrees at high RPM. Newer cylinder head designs generally see max power around 28-32 degrees at high RPM. Be careful when tuning here as detonation can quickly destroy an engine at WOT. See below.

	Unnamed Table												Rev Limit: 5500	Pro80000
101	10	10	14	17	21	25	29	32	36	36	36	36		
94	10	16	14	17	21	25	29	32	36	36	36	36		
86	10	16	14	17	21	25	29	32	36	36	36	36		
79	10	16	14	17	21	25	29	32	36	36	36	36		
71	10	16	16	19	23	27	31	34	38	38	38	38		
64	21	16	17	20	24	28	32	35	39	39	39	39		
57	21	16	18	21	25	29	33	36	40	40	40	40		
49	21	16	19	22	26	30	34	37	41	41	41	41		
42	21	16	20	23	27	31	35	38	42	42	42	42		
34	21	16	22	25	29	33	37	40	44	44	44	44		
27	21	16	23	26	30	34	38	41	45	45	45	45		
20	21	16	24	27	31	35	39	42	46	46	46	46		
***	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500		

**6. High RPM/Low load-** This area of the table is not used much unless the driver is purposely holding the car in a low gear at high RPM with light throttle. Timing should be very high around 40-50 degrees. Retarding timing here will excessively heat exhaust components.

	Unnamed Table											Rev Limit: 5500	Pro80000
101	10	10	14	17	21	25	29	32	36	36	36	36	
94	10	16	14	17	21	25	29	32	36	36	36	36	
86	10	16	14	17	21	25	29	32	36	36	36	36	
79	10	16	14	17	21	25	29	32	36	36	36	36	
71	10	16	16	19	23	27	31	34	38	38	38	38	
64	21	16	17	20	24	28	32	35	39	39	39	39	
57	21	16	18	21	25	29	33	36	40	40	40	40	
49	21	16	19	22	26	30	34	37	41	41	41	41	
42	21	16	20	23	27	31	35	38	42	42	42	42	
34	21	16	22	25	29	33	37	40	44	44	44	44	
27	21	16	23	26	30	34	38	41	45	45	45	45	
20	21	16	24	27	31	35	39	42	46	46	46	46	
...	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500	

High RPM/  
Low Load  
Area

**7. Deceleration-** This is when your foot is completely off the throttle. MAP is at its lowest (highest vacuum). Timing is generally between 35-50 degrees. A popping sound in the exhaust can indicate too much timing advance here. See below.

	Unnamed Table											Rev Limit: 5500	Pro80000
101	10	10	14	17	21	25	29	32	36	36	36	36	
94	10	16	14	17	21	25	29	32	36	36	36	36	
86	10	16	14	17	21	25	29	32	36	36	36	36	
79	10	16	14	17	21	25	29	32	36	36	36	36	
71	10	16	16	19	23	27	31	34	38	38	38	38	
64	21	16	17	20	24	28	32	35	39	39	39	39	
57	21	16	18	21	25	29	33	36	40	40	40	40	
49	21	16	19	22	26	30	34	37	41	41	41	41	
42	21	16	20	23	27	31	35	38	42	42	42	42	
34	21	16	22	25	29	33	37	40	44	44	44	44	
27	21	16	23	26	30	34	38	41	45	45	45	45	
20	21	16	24	27	31	35	39	42	46	46	46	46	
...	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500	

Deceleration  
Area

**8. Turbo/Supercharger tuning-** Edit the MAP breakpoints to allow for tuning for boost. The MAP sensor is rated to 300 kPa (29 psi boost). The highest MAP breakpoint value allowed is 252 kPa (22 psi boost). Every 6.9 kPa over 101 equals 1 psi of boost. For example, in the picture below, the top MAP breakpoint has been set to 135 kPa (5 psi boost). The top timing advance row has been retarded by 5 degrees. This will give you a 1 degree retard for 1 psi of boost up to 5 psi. If the boost goes up off the table, the highest row is used for timing. See boost conversion chart below.

← app guide		Rev Limit: 5500										Pro80000	
135	10	10	10	12	16	20	24	27	31	31	31	31	
101	10	16	14	17	21	25	29	32	36	36	36	36	
86	10	16	14	17	21	25	29	32	36	36	36	36	
79	10	16	14	17	21	25	29	32	36	36	36	36	
71	10	16	16	19	23	27	31	34	38	38	38	38	
64	21	16	17	20	24	28	32	35	39	39	39	39	
57	21	16	18	21	25	29	33	36	40	40	40	40	
49	21	16	19	22	26	30	34	37	41	41	41	41	
42	21	16	20	23	27	31	35	38	42	42	42	42	
34	21	16	22	25	29	33	37	40	44	44	44	44	
27	21	16	23	26	30	34	38	41	45	45	45	45	
20	21	16	24	27	31	35	39	42	46	46	46	46	
...	400	600	940	1290	1630	1970	2310	2660	3000	3830	4670	5500	

### BOOST CONVERSION CHART

kPa	Boost psi		kPa	Boost psi
108	1		184	12
115	2		191	13
122	3		198	14
129	4		205	15
135	5		212	16
142	6		218	17
149	7		225	18
156	8		232	19
163	9		239	20
170	10		246	21
177	11		252	22

