

LS1 Idle Tips & Tricks



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B.S. Meteorology – Tuning Enthusiast

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The Basics:

1. Proper Fueling
2. Enough Base Spark
3. Enough Desired Airflow.

*Make the least amount of changes to maximize Idle!
Do not Alter the Following:*

1. IAC Effective Area (unless different TB size).
2. Start-Up Airflow Corrections
3. Airflow Parameter(s) that affect Idle.

1. B0101-Main VE Table: Perform a **CALC VE** or **AUTOVE** for the Idle Rpm's 800- 1200. For 400 Rpm's extrapolate the 800 Rpm Values minus 10%.

		Map kPa {link: SAE.MAP}																		
		15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	105
RPM {link: SAE.RPM}	400	14.97	22.49	27.47	29.40	31.28	33.52	33.33	39.24	45.31	47.57	48.33	48.58	50.30	50.80	51.05	51.30	51.81	52.31	52.81
	800	16.64	24.98	30.52	32.66	34.76	37.24	37.04	43.60	50.35	52.86	53.70	53.98	55.88	56.44	56.72	57.00	57.56	58.12	58.68
	1200	19.50	28.98	36.79	41.14	42.27	43.98	50.99	54.48	57.01	60.26	58.55	60.50	62.75	63.38	63.69	64.00	64.63	65.25	65.89
	1600	21.44	32.94	41.48	49.15	53.58	56.54	58.77	63.56	64.58	64.62	63.00	65.41	68.33	69.01	69.35	69.70	70.38	71.06	71.74
	2000	22.26	33.93	46.08	52.60	56.27	59.23	61.66	65.92	68.64	68.72	71.42	73.44	74.49	75.23	75.61	75.98	76.72	77.47	78.21
	2400	23.25	36.31	50.82	56.87	60.93	65.10	68.01	70.38	71.79	74.03	74.68	77.86	79.81	80.61	81.01	81.41	82.21	83.00	83.80
	2800	24.75	42.49	53.70	59.67	63.42	68.56	70.99	74.57	76.64	78.09	80.80	82.83	85.41	86.27	86.69	87.12	87.98	88.83	89.68
	3200	26.93	51.08	59.09	63.57	67.00	72.49	75.55	80.46	82.03	85.01	86.86	90.00	89.89	90.79	91.24	91.69	93.12	93.48	94.39
	3600	34.01	63.44	67.73	70.31	74.20	78.10	81.74	87.45	87.99	92.32	93.08	96.27	97.32	98.29	98.77	99.26	99.84	101.21	102.18
	4000	48.42	76.90	80.84	84.01	87.17	88.23	90.57	94.28	95.02	96.95	97.93	100.71	100.71	101.71	102.22	102.72	103.73	104.73	105.74
	4400	58.81	85.82	88.91	89.39	90.91	93.55	93.86	97.23	97.60	99.10	99.45	102.84	103.14	104.17	104.69	105.21	106.24	107.27	108.30
	4800	65.69	89.37	92.20	93.68	94.63	95.59	96.54	98.35	99.10	99.51	100.51	103.58	103.88	104.92	105.44	105.96	107.00	108.03	109.07
	5200	66.02	89.82	92.65	94.15	95.11	96.06	97.03	98.85	99.60	100.00	101.01	104.10	104.40	105.44	105.96	106.48	107.53	108.58	109.62
	5600	65.49	89.11	91.33	92.80	94.28	95.02	95.02	97.23	97.60	98.00	100.00	101.67	102.00	103.02	103.53	104.04	105.06	106.08	107.10
	6000	64.06	87.16	89.90	91.36	92.28	93.21	94.15	95.11	96.07	97.04	98.02	99.00	100.01	101.01	101.51	102.01	103.01	104.01	105.01
	6400	61.53	83.70	86.34	87.74	88.63	89.52	90.42	91.34	92.26	93.20	94.14	95.08	96.05	97.01	97.49	97.97	98.93	99.89	100.85
6800	59.10	80.40	82.94	84.27	85.12	85.99	86.85	87.73	88.62	89.51	90.42	91.33	92.25	93.17	93.64	94.10	95.02	95.94	96.86	
7200	56.75	77.20	79.64	80.92	81.75	82.57	83.41	84.25	85.09	85.96	86.83	87.70	88.59	89.47	89.91	90.36	91.24	92.13	93.01	
7600	56.75	77.20	79.64	80.92	81.75	82.57	83.41	84.25	85.09	85.96	86.83	87.70	88.59	89.47	89.91	90.36	91.24	92.13	93.01	
8000	56.75	77.20	79.64	80.92	81.75	82.57	83.41	84.25	85.09	85.96	86.83	87.70	88.59	89.47	89.91	90.36	91.24	92.13	93.01	

2. **B4307-Desired Airflow:** Log SAE.MAF (g/s) vs ECT at Idle. The goal is to have your MAF, VE, and Desired Airflow all utilizing identical Airflow Values. **RAFIG** may produce values too low.

MAF Grams/s (Average)

Desired Airflow (Grams/Second)

	In_Gear
-40	
-28	
-16	
-4	
8	
20	
32	11.57
44	11.21
56	10.02
68	9.45
80	9.45
92	8.44
104	
116	
128	
140	

ECT °C

Desired Airflow (Grams/Second)

	In Gear	Park/Neutral
-40	22.350	0.000
-28	19.623	0.000
-16	17.150	0.000
-4	14.942	0.000
8	13.448	0.000
20	12.000	0.000
32	11.151	0.000
44	10.289	0.000
56	9.612	0.000
68	9.000	0.000
80	8.500	0.000
92	8.000	0.000
104	7.750	0.000
116	7.500	0.000
128	7.500	0.000
140	7.500	0.000

ECT °C {link: SAE.ECT}

3. **B4352-Cat Lightoff Idle Offset Multiplier:** Make Multiplier zero (0). Eliminates additional Airflow Source while tuning Idle.

4. **B4504- Airflow learning Control Delay:** Change per *Idle Tutorial* from 1.3 to 4.3 seconds.

5. **B4512, B4514, B4515- Learning Parameters:** Per *Idle Tutorial*.

6. **B4309-Throttle Cracker Airflow in Gear (TC):** Utilize the least amount of air to prevent Rpm's hanging (cruise control), but enough to prevent excessive engine braking and lack of throttle response. A great 'Stall Saver' is to add +4 g/s to the 400 Rpm Values. A good TC Table will gradually decrease throughout the Rpm's and MPH range, with no 'holes' or added air. I use a 98 Camaro LS1 Automatic TC Table with ~ -33% less air.

	0	6	13	19	26	32	39	45	51	58	64	71	77	84	90	97	103
400	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00
1000	0.13	0.47	0.47	0.59	0.59	0.59	0.65	0.71	0.77	0.77	0.95	1.06	1.06	1.06	1.06	1.06	1.06
1600	0.24	0.71	0.77	0.83	0.83	0.95	0.95	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2200	0.71	0.95	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06	1.06
2800	0.95	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18	1.18
3400	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
4000	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
4600	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
5200	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
5800	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
6400	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50
7000	0.95	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50	1.50

7. B4315-B4320 Throttle Follower: Identical values as *Idle Tutorial*. Great way to get additional Air when you press the throttle.

8. B5932-Base Spark in Gear: Add +4 degrees to Spark Values in the 400 Rpm Idle Region, and +8 to to the 0 Rpm Idle Region on Base Spark. If the car wants to stall you automatically get a bump in Spark to help prevent Spark for going to low. If your car wants to stall when you shift into gear (High-Octane Spark), then your Spark is probably dropping to low. Your High Octane Spark and Base Spark in gear should be within 4 degrees of each other.

	Grams/Cylinder (link: GM.DYNCYLAIR DMA)																													
	0.08	0.12	0.16	0.20	0.24	0.28	0.32	0.36	0.40	0.44	0.48	0.52	0.56	0.60	0.64	0.68	0.72	0.76	0.80	0.84	0.88	0.92	0.96	1.00	1.04	1.08	1.12	1.16	1.20	
0	32.0	32.0	32.0	32.0	32.0	24.0	21.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
400	28.0	28.0	28.0	28.0	28.0	24.0	21.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
800	24.0	24.0	24.0	24.0	24.0	24.0	21.0	11.0	10.0	9.0	8.0	7.0	6.0	5.0	4.0	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1200	28.0	28.0	28.0	28.0	28.0	24.0	21.0	14.0	13.0	12.0	11.0	10.0	9.0	8.0	7.0	6.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
1600	40.0	40.0	40.0	40.0	29.0	25.0	21.0	20.0	19.0	18.0	17.0	16.0	15.0	14.0	13.0	12.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
2000	44.0	44.0	44.0	44.0	30.0	28.0	27.0	26.0	25.0	24.0	23.0	22.0	21.0	20.0	19.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2400	44.0	44.0	44.0	44.0	36.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	24.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
2800	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
3200	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
3600	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
4000	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
4400	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0
4800	44.0	44.0	44.0	44.0	36.0	35.0	34.0	33.0	32.0	31.0	30.0	29.0	28.0	27.0	26.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0	25.0

Note: Tables are for Illustrative Purposes only. Use discretion in modifying Tune..

Credits: SSpdDmon's EFILive's Idle Tutorial: <http://forum.efilive.com/showthread.php?4661-Idle-Tuning-Helpful-Info-Inside>.