

A9L boost candidate: manual entry guide

Binary Editor 5.946 | GUFB.xlsx revision 103 | Candidate revision 1 | 93 AKI pump gasoline | approximately 8 psi | no external retard

Purpose: Reproduce the supplied review candidate manually from the exact accepted NA baseline. These instructions document that candidate; they do not add further tuning changes. It remains unvalidated in Binary Editor and on the engine.

Starting file: A9L_ACCEPTED_NA_BASELINE.BIN (same bytes as the originally uploaded A9L-boosted.BIN). Use Save As to make a new working file. Do not start from a tune he has continued editing since that upload.

Entry order: 1. FN035 endpoint. 2. FN071 load axis. 3. HLCTM scalar. 4. All highlighted cells in the following tables. 5. Save with checksum enabled, close, reopen, and compare. Keep the engine off while entering this complete set of changes.

How to read tables: Yellow cells show **NEW** with the old value beneath in parentheses. Plain cells are unchanged and are shown only to orient you. Row R0 is the lowest-load row; C0 is the lowest-input column. R/C are guide indices, not Excel addresses or guaranteed labels in BE. Match the numeric headers even if BE reverses the displayed row order.

Important: Table row headers below are the NEW load headers after entering FN071. The old value in a cell is from the same stored R/C position in the baseline, not from the same physical load after reindexing. Changing an axis alone does not resample the other tables. Enter every listed table change.

Precision: Enter the printed NEW numbers. Values use up to six decimal places to reproduce stored values; if necessary, increase BE display digits temporarily. A displayed rounded value alone is not a reason to skip an entry. Do not enter hexadecimal, raw bytes, or a percent sign into table cells.

Finding a parameter: Use the exact category/title and PID printed on each page. The table/function name is from his supplied definition. Column axes are identified by their own scaling-function PID.

Unchanged settings: MAF transfer, injector settings, fuel targets, fuel-load scaling, RPM axis, PRLDSW, WOT/sea-level selections, adaptive learning, and EGR enable are retained. FN901 and FN1119 contain zeros and need no manual entry. FN1353 has two views of the same bytes; use the specified view only.

The full package contains the original, candidate, definition, and engineering change report. Confirm final timing, wideband accuracy, fuel delivery and charge-temperature sensing before controlled engine testing.

1. Functions and scalar

Enter these first. Function rows are listed from highest input to lowest input, matching the stored function order. Do not confuse function outputs with table cell values.

FN035 - Air - Load Scaling Sealevel vs RPM

Function row	Input (RPM)	Output (Load)	Action
1	16383.75	83.999634 (was 1.000977)	CHANGE
2	6000	83.999634	Keep
3	5200	88.000488	Keep
4	4700	92.001343	Keep
5	3000	80.999756	Keep
6	1500	67.498779	Keep
7	0	64.99939	Keep

FN071 - Scaling - Spark HEGO & EGR Table Load Rows

Function row	Input (Load)	Output (Row)	Action
1	199.996948	7	Keep
2	160.00061 (was 75)	7	CHANGE
3	100 (was 60.00061)	6	CHANGE
4	60.00061 (was 10.00061)	5 (was 1)	CHANGE
5	39.99939 (was 4.998779)	4 (was 0)	CHANGE
6	4.998779 (was 0)	0	CHANGE
7	0	0	Keep

FN071: Input is raw load in percent (for example 160), output is the row index (for example 7). Keep both endpoint pairs as shown. The new table rows are approximately 5, 13.75, 22.5, 31.25, 40, 60, 100 and 160 percent.

HLCTM - Fuel - Time at High Load to Force Open Loop

Parameter	Old seconds	NEW seconds
Fuel - Time at High Load to Force Open Loop	2	0

FN904A - Spark - Sealevel

62 changed cells | Units: Deg BTDC | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN070 - Scaling - Spark Fuel & EGR Table RPM Columns. Units: RPM.

Row / LOAD %	C0 900	C1 1100	C2 1300	C3 1500	C4 2000	C5 2500	C6 3000	C7 4000	C8 5000	C9 6000
R0 4.998779	26.75 (28)	30.25 (31)	32.75 (33)	33.75 (34)	33.75 (34)	33.25 (34)	31.25 (34)	31.25 (34)	31.25 (34)	31.25 (34)
R1 13.748932	28.5 (28)	33 (32)	34.75 (34)	35.75 (35)	35.75 (35)	34.5 (34)	25.25 (28)	25.25 (28)	25.25 (28)	25.25 (28)
R2 22.499084	32.25 (33)	37	37	37.5 (38)	37.5 (38)	38	28	28	28	28
R3 31.249237	29.25 (30)	36.25 (37)	37.5 (38)	35.75 (36)	35.5 (36)	37.25 (38)	28	28	28	28
R4 39.99939	24 (25)	27 (32)	29.5 (34)	30 (34)	32.5 (33)	32	28	28	28	28
R5 60.00061	8 (16)	5 (16)	6.5 (18)	10 (20)	19.5 (26)	21 (27)	21 (27)	21 (27)	21 (27)	21 (27)
R6 100	8 (9)	5 (10)	6.5 (11)	10 (14)	18 (21)	18.75 (21)	19.5 (21)	21	21	20 (21)
R7 160.00061	8 (9)	5 (10)	6.5 (11)	10 (13)	14 (21)	14 (21)	14 (21)	14.75 (21)	15 (21)	14.25 (21)

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN905A - Spark - Altitude

41 changed cells | Units: Deg BTDC | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN070 - Scaling - Spark Fuel & EGR Table RPM Columns. Units: RPM.

This table is currently inactive under the retained mode settings. Enter its resampling changes to reproduce the candidate; do not enable the feature.

Row / LOAD %	C0 900	C1 1100	C2 1300	C3 1500	C4 2000	C5 2500	C6 3000	C7 4000	C8 5000	C9 6000
R0 4.998779	28	28	28	31	33	34	34	34	34	34
R1 13.748932	27 (28)	27.25 (28)	29 (28)	32 (31)	33.75 (33)	35 (34)	35.5 (34)	35.5 (34)	35.5 (34)	35.5 (34)
R2 22.499084	23.75 (25)	24.75 (26)	28 (30.5)	31.25 (33.5)	34 (35)	35.5 (36.5)	36.75 (38)	36.75 (38)	36.75 (38)	36.75 (38)
R3 31.249237	19.25 (20)	20.25 (21)	19.25 (20)	22.75 (24)	29.25 (31)	30.75 (32)	32.25 (33)	32.25 (33)	32.25 (33)	32.25 (33)
R4 39.99939	14	14	14	14	16	21	27	27	27	27
R5 60.00061	6.5 (8)	8 (9)	9 (10)	10 (11)	12 (13)	14 (17)	18 (22)	18 (22)	18 (22)	18 (22)
R6 100	6.5	6.5 (8)	9	10	12	14	18	18	18	18
R7 160.00061	6.5	6.5	9	10	12	14	18	18	18	18

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN1133 - Spark - ECT Adder

3 changed cells | Units: Deg Adder | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN033 - Scaling - Part Throttle Spark Adder ECT Column. Units: DegF.

Row / LOAD %	C0 60	C1 75.333333	C2 90.666667	C3 106	C4 196	C5 210	C6 230
R0 4.998779	0	0	0	0	0	0	0
R1 13.748932	0	0	0	0	0	0	0
R2 22.499084	0	0	0	0	0	0	0
R3 31.249237	0	0	0	0	0	0	-0.5 (0)
R4 39.99939	0	0	0	0	0	0	-4
R5 60.00061	0	0	0	0	0	-1 (0)	-4
R6 100	0	0	0	0	0	-2 (-1)	-4
R7 160.00061	0	0	0	0	0	-2	-4

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN1321 - Fuel - Transient Equilib Intake Surface

43 changed cells | Units: lb/min x 1000 | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN022 - Scaling - Fuel Table ECT/ACT Columns. Units: DegF.

Temperature columns are the blended ACT/ECT input defined by ALPHA. Do not change ALPHA or FN022.

Row / LOAD %	C0 -30	C1 0	C2 30	C3 60	C4 90	C5 120	C6 150	C7 180	C8 210	C9 240
R0 4.998779	32.958984	32.958984	31.25	29.541016	27.34375	21.972656	11.230469	0.488281	0.488281	0.488281
R1 13.748932	37.353516 (35.888672)	37.353516 (35.888672)	35.400391 (34.179688)	33.447266 (32.226562)	30.761719 (29.785156)	25.146484 (24.169922)	13.183594 (12.695312)	0.976562	0.976562	0.976562
R2 22.499084	40.771484 (39.794922)	40.771484 (39.794922)	38.574219 (37.597656)	36.132812 (35.400391)	33.447266 (32.714844)	27.34375 (26.611328)	14.648438 (14.160156)	1.464844 (1.220703)	1.220703 (0.976562)	0.976562
R3 31.249237	44.189453 (43.701172)	44.189453 (43.701172)	41.748047 (41.259766)	39.0625 (38.574219)	36.132812 (35.644531)	29.785156 (29.296875)	16.601562 (16.357422)	1.953125	1.708984	1.464844
R4 39.99939	47.607422	47.607422	45.166016	42.236328	39.0625	32.470703	19.042969	2.929688	2.197266	1.953125
R5 60.00061	56.396484 (52.001953)	56.396484 (52.001953)	53.710938 (49.072266)	50.537109 (46.142578)	46.875 (42.724609)	40.771484 (36.132812)	28.564453 (22.705078)	6.591797 (4.394531)	4.638672 (3.173828)	2.685547 (2.197266)
R6 100	62.255859 (56.396484)	62.255859 (56.396484)	59.082031 (53.710938)	55.419922 (50.537109)	51.269531 (46.875)	46.630859 (40.771484)	37.109375 (28.564453)	10.009766 (6.591797)	7.080078 (4.638672)	3.90625 (2.685547)
R7 160.00061	62.255859	62.255859	59.082031	55.419922	51.269531	46.630859	37.109375	10.009766	7.080078	3.90625

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN1353 - HEGO - Bias

13 changed cells | Units: definition units | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN039 - Scaling - HEGO Table RPM Columns. Units: RPM.

Use HEGO - Bias (FN1353), NOT HEGO - Bias (AFR view). Both views edit the same bytes but use different conversion equations.

Row / LOAD %	C0 700	C1 900	C2 1950	C3 3000
R0 4.998779	0	0.100078	0.100078	0.100078
R1 13.748932	0	0.021445 (0.028594)	0.021445 (0.028594)	0.021445 (0.028594)
R2 22.499084	0	-0.007148 (0)	-0.007148 (0)	-0.007148 (0)
R3 31.249237	0	-0.028594	-0.028594	-0.028594
R4 39.99939	0	-0.028594	-0.028594	-0.028594
R5 60.00061	-0.028594	-0.085781 (-0.057188)	-0.085781 (-0.057188)	-0.085781 (-0.057188)
R6 100	-0.114375 (-0.028594)	-0.114375 (-0.085781)	-0.114375 (-0.085781)	-0.114375 (-0.085781)
R7 160.00061	-0.114375	-0.114375	-0.114375	-0.114375

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN1121 - Spark - EGR Adder

7 changed cells | Units: Deg Adder | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN070 - Scaling - Spark Fuel & EGR Table RPM Columns. Units: RPM.

This table is currently inactive under the retained mode settings. Enter its resampling changes to reproduce the candidate; do not enable the feature.

Row / LOAD %	C0 900	C1 1100	C2 1300	C3 1500	C4 2000	C5 2500	C6 3000	C7 4000	C8 5000	C9 6000
R0 4.998779	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
R1 13.748932	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
R2 22.499084	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
R3 31.249237	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
R4 39.99939	0	0	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
R5 60.00061	0	0	0	0 (0.34375)	0 (0.34375)	0 (0.5)	0 (0.75)	0 (0.75)	0 (0.75)	0 (0.75)
R6 100	0	0	0	0	0	0	0	0	0	0
R7 160.00061	0	0	0	0	0	0	0	0	0	0

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN908A - Air - EGR Sealevel

23 changed cells | Units: EGR% | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN070 - Scaling - Spark Fuel & EGR Table RPM Columns. Units: RPM.

This table is currently inactive under the retained mode settings. Enter its resampling changes to reproduce the candidate; do not enable the feature.

Row / LOAD %	C0 900	C1 1100	C2 1300	C3 1500	C4 2000	C5 2500	C6 3000	C7 4000	C8 5000	C9 6000
R0 4.998779	0	0	0	0	0	0	0	0	0	0
R1 13.748932	0	0	0	0	0	0	0	0	0	0
R2 22.499084	0	0	0	1 (0)	1.25 (0)	2 (0)	2 (0)	1.5 (0)	0.25 (0)	0
R3 31.249237	0	0	0.25 (0)	4.5 (4)	5.75 (5)	8.25 (8)	8.25 (8)	6.25 (6)	1	0
R4 39.99939	0	0	2	8	11	11	11	8.5	1	0
R5 60.00061	0	0	2	3 (8)	3 (9)	3.5 (9.5)	3.75 (8)	3 (5.75)	0	0
R6 100	0	0	0 (2)	0 (3)	0 (3)	0 (3.5)	0 (3.75)	0 (3)	0	0
R7 160.00061	0	0	0	0	0	0	0	0	0	0

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

FN908B - Air - EGR Altitude

22 changed cells | Units: EGR% | Row axis: FN071, raw LOAD (%) | Yellow = NEW value; parentheses = old value

Column header source: FN070 - Scaling - Spark Fuel & EGR Table RPM Columns. Units: RPM.

This table is currently inactive under the retained mode settings. Enter its resampling changes to reproduce the candidate; do not enable the feature.

Row / LOAD %	C0 900	C1 1100	C2 1300	C3 1500	C4 2000	C5 2500	C6 3000	C7 4000	C8 5000	C9 6000
R0 4.998779	0	0	0	0	0	0	0	0	0	0
R1 13.748932	0	0	0	0.75 (0)	1 (0)	1.5 (0)	1.5 (0)	0	0	0
R2 22.499084	0	0	0	2.75 (2)	4.25 (2.5)	5.5 (4)	5.25 (4)	2 (0)	1.5 (0)	1 (0)
R3 31.249237	0	0	0	5.25 (5)	9.5	9.75 (10)	9	7.75 (8)	6.25 (6.5)	3.75 (4)
R4 39.99939	0	0	0	7	9	8.5	8	5	4.75	2
R5 60.00061	0	0	0	0 (4)	0 (4)	0 (4)	0 (3.75)	0 (2.5)	0 (2.5)	0
R6 100	0	0	0	0	0	0	0	0	0	0
R7 160.00061	0	0	0	0	0	0	0	0	0	0

Locate a cell: match its numeric load row and numeric column input above. Only yellow cells require a different stored value. All plain values provide a cross-check against the starting file.

Finish and verify

Save only after the complete set of axis, scalar and table changes has been entered.

Checksum: Do not type ROM_TO manually. Save with Binary Editor checksum enabled and let it calculate the value. The supplied candidate has ROM_TO = 61572 (0xF084). If you reproduce exactly the same bytes and BE makes no extra logging/code changes, this should agree. A checksum match alone does not prove the tune is correct.

This guide covers 8 changed tables and 214 changed table cells, plus the function and scalar edits. Every non-checksum changed byte in the candidate is accounted for.

No table entry needed: FN901 - Spark - Base; FN1119 - Trans - Torque Truncation. Their stored cells remain zero. FN1353 AFR is an alias, not another table to enter.

Reopen the manually saved tune. Compare against the supplied candidate using the same GUFB.xlsx definition. Investigate every unexpected difference, including any software-inserted logging patches. Confirm table headers, mode selections and physical timing before writing the ECU.

Candidate: A9L_93oct_8psi_REVIEW_v1.BIN

SHA256: 3074add8600aa87b5f84e4c098036a7d69fa9030ab2d81c8acb263d8c9567052

Baseline: A9L_ACCEPTED_NA_BASELINE.BIN

SHA256: 8c8fc14ab5c434646ef39a00cb09a4d7427a4c5be9b469a5ce1a1380269e0553

Source of all titles, units, axes and conversion equations: owner-supplied GUFB.xlsx revision 103. Old and new values are decoded directly from the original and candidate binaries. No calibration values were changed while producing this guide.