

Groups/STANDARD MAPPING/FUEL CORRECTIONS/FUELING DURING STARTING:

Injection Start Angle in Crank: 0.25 to 720.00 degrees

During cranking, injection pulses are timed to start at a fixed engine angle



Groups/STANDARD MAPPING/FUEL CORRECTIONS/FUELING DURING STARTING/SINGLE CALIBRATIONS:

Preliminary Injection: Decimal 0.000 to 262.140 milliseconds

The "Preliminary Injection" is a single fuel pulse that is injected by all primary injectors as the engine start to turn. It is used to wet the inlet manifold walls.

A screenshot of a software window titled "Matrix: Preliminary Injection (ms)". The window has a blue header bar with a dropdown arrow on the left and a close button on the right. Below the header, there is a table with "ECT (°C)" as the column header. The table contains 18 columns and 2 rows of data.

ECT (°C)	-30	-20	-10	0	10	20	30	40	50	60	70	80	90	100	110	120	130
	35.000	32.252	29.500	26.752	24.000	22.000	18.500	15.000	11.500	8.000	4.500	1.000	1.000	1.000	1.000	0.952	0.900

Base Fuel in Crank: Decimal 0.000 to 30.000 milliseconds

This map is used to determine the base fuel time when the engine is cranking. Once the engine speed exceeds the "Crank Exit Speed" the ECU switches to RUN mode and obtains its fuelling from the "Base Fuel Map".

The current value can be viewed as "inj\_t\_base" on the dashboard.  
#line 4858 "desc.c"

Base Fuel in Crank: 0.00 to 30.00 milliseconds

This map is used to determine the base fuel time when the engine is cranking. Once the engine speed exceeds the "Crank Exit Speed" the ECU switches to RUN mode and obtains its fuelling from the "Base Fuel Map".

The current value can be viewed as "inj\_base" on the dashboard.

A screenshot of a software window titled "Matrix: Base Fuel in Crank (ms)". The window has a blue header bar with a dropdown arrow on the left and a close button on the right. Below the header, there is a table with "TPS (°)" as the column header. The table contains 17 columns and 2 rows of data.

TPS (°)	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85
	2.00	2.00	2.00	2.00	2.10	2.45	2.59	2.72	2.86	3.00	3.10	3.00	2.50	1.00	0.00	0.00	0.00

Cranking Multiplier: Decimal 0.00 to 16.00

This multiplier is used to correct the base fuel time whilst the engine is cranking. The Cylinder Count axis on the map is used to give a bigger correction when the engine initial starts to turn and to enable this correction to decay away as the inlet becomes wet.

Example values: 1.050 - gives 5% increase  
 1.000 - gives no change  
 0.950 - gives 5% decrease

The current value can be viewed as "inj\_m\_crank" on the dashboard.

Matrix: Cranking Multiplier

Cylinder Count Breakpoints

ECT (°C)	10	210	310	450	480	496	500	540
65.0	1.00	1.71	1.59	1.47	1.35	1.24	1.12	1.00
20.0	1.79	1.70	1.61	1.52	1.43	1.34	1.17	1.00
5.0	1.79	1.73	1.68	1.62	1.56	1.51	1.25	1.00
-5.0	5.61	4.71	3.81	2.92	2.02	1.68	1.34	1.00
-15.0	5.91	4.97	4.03	3.09	2.15	1.77	1.38	1.00
-20.0	6.45	5.43	4.41	3.40	2.38	1.92	1.46	1.00
-25.0	7.81	6.60	5.39	4.18	2.96	2.31	1.65	1.00
-30.0	9.60	8.31	7.01	5.72	4.42	3.08	1.74	1.00