TOYOTA ALTEZZA（SXE10・3SGE・6MT)STARTDATA MANUAL ＝TP5-7Harness

TOYOTA ALTEZZA ECU Side Terminal
[TP5-7Base]
Refer the following for special setting when modifying the wiring, etc.

To prepare the vehicle data, write SXE10 STARTDATA on HKS website to F-CONVPRO. Setting by using an actual vehicle according to each vehicle characteristics is required.
＊SXE10 STARTDATA is data only to start the engine.

The data were prepared based on the vehicle using high-octane gasoline (th
octane level is approximately 98-100), and the following parts were installe

- Super Power Flow KIT
- Super Header TYPE2
- Silent Hi-POWER Muffler

Explanatory Notes

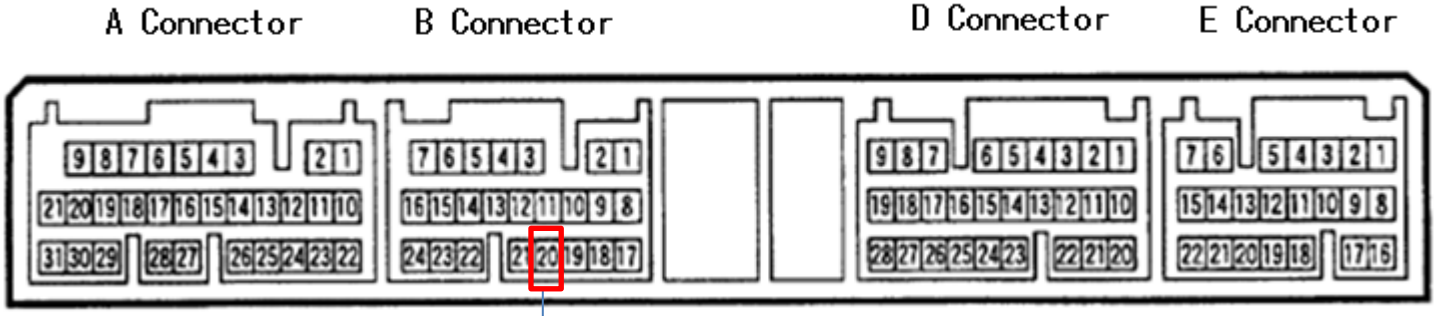
Ⓑ: Power Supply (12V)
Ⓤ: Backup Power Supply (12V)
Ⓔ: Ground
Ⓢ: Center Ground
Ⓟ: Pressure Sensor, Airflow Signal, etc.
FCD :Press Sensor Signal for HKS FCD
ARF :Airflow Signal for HKS AFR
Ⓢ: Speed Signal
SLD :Speed Signal for HKS SLD
Ⓘ: RPM Signal
※I :RPM Signal Level Converter Required.
#: Injector Signal
#P :Primary Injector Signal
#S :Secondary Injector Signal
Ⓣ: Throttle Angle Signal
IG: Ignition Signal
IGL : Leading Ignition Signal
IGT :Trailing Ignition Signal
IGSL : Rotor Detect Signal(Leading Side)
IGST : Rotor Detect Signal(Trading Side)
WT: Water Temp Signal
IT: Intake Air Temp Signal
Ⓚ: Knocking Signal
Ⓞ: O2 Sensor Signal
S/C・T/C: Supercharger・Turbocharger
A/T: Automatic Transmission
M/T:・ Manual Transmission

※ When there is more than one signal, a number comes after the mark.
The number comes with the injector and ignition signals mean a number of cylinder.

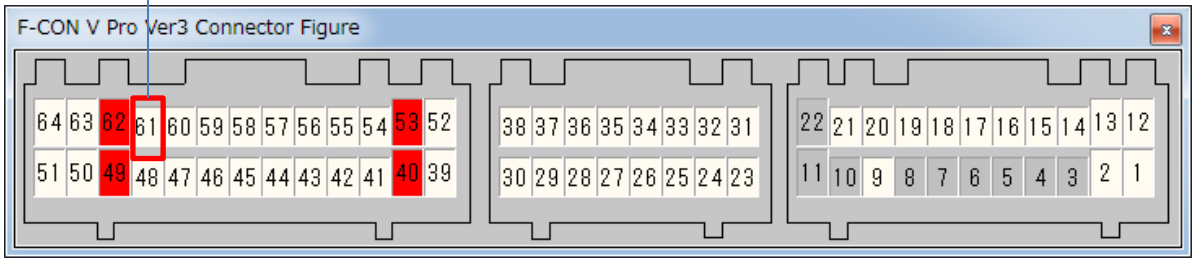
This explains the main points to prepare STARTDATA using the modified harness TP5-7 for TOYOTA ALTEZZA(SXE10). For mapping, parameter settings, and data logging, refer to the operation manual of F-CON V Pro Ver.3.4.

■Accelerator position signal input (Hardware)

TOYTOA ALTEZZA (SXE10) has electronically controlled throttles as standard.
Engine load is measured by connecting throttle butterfly signal 1 to F-CON terminal #20. However there can sometimes be cases when releasing the accelerator does not fully close the throttle which causes fuel to be injected and therefore engine braking may be compromised. To avoid this situation, connect accelerator position signal 1 to F-Con terminal #61. ＊Accelerator position overrides physical throttle position and operates as per fully closed throttle condition.

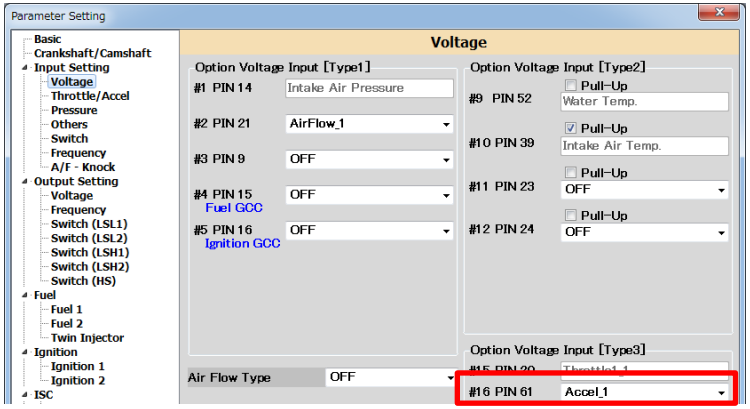


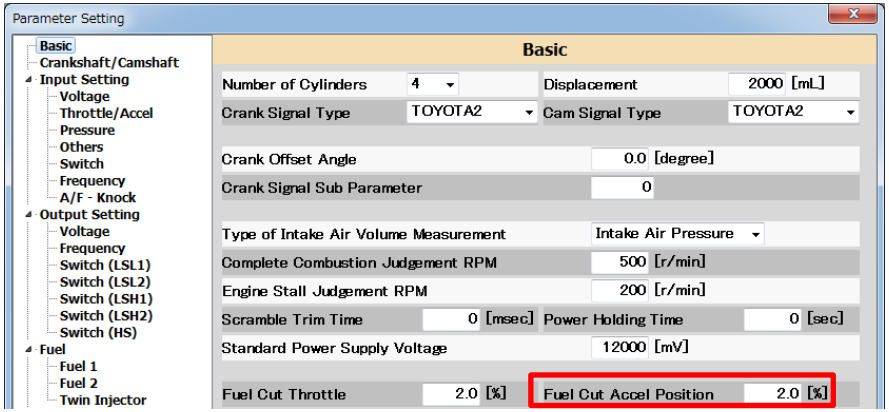
Engine side accelerator position sensor 1



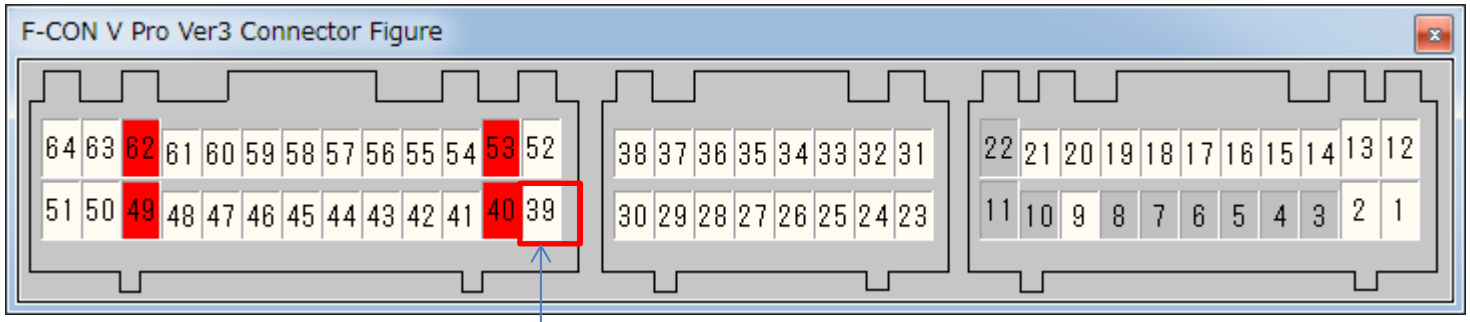
■Accelerator position signal input (software)

In Parameter / input settings / voltage tab, Pin 61 is set to Access 1. Setting accelerator fully closed level to 2.0% can avoid the above mentioned issue.





■Intake Air Temperature Signal additional information.
The stock air flow meter contains IAT sensors. In order to measure actual IAT it is necessary to modify the wiring harness as indicated below:



Remove the wire connected to terminal #39, connect a resistor then connect to body earth.

× — 2～3 kΩ resister — BODY EARTH

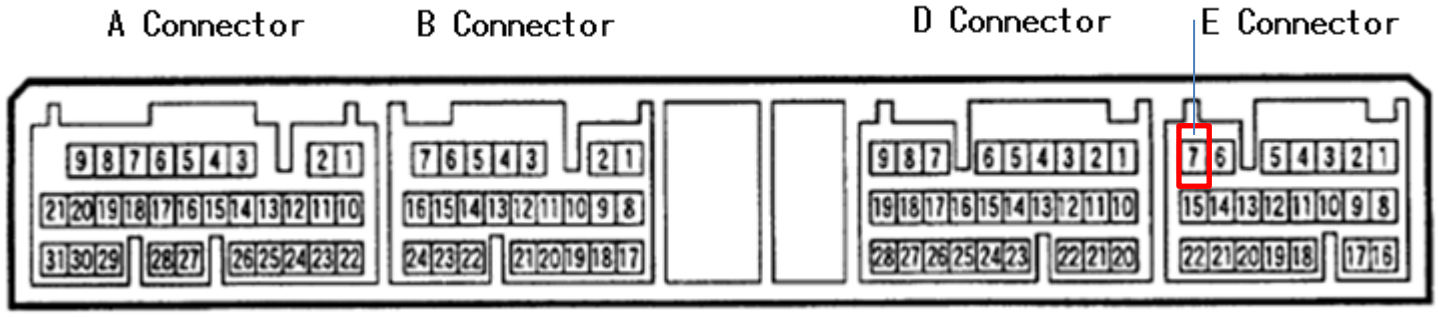
Engine side THA Sensor

Connect HKS IAT sensor to now vacant terminal #39

■Managing the Check Engine Light
When using FCONVPro, due to the complete customization of the fueling settings an AFR error could cause an engine check light. In this case, disconnecting and insulating the terminal below will stop the light illuminating. Please perform this if the light causes concern. Engine error codes can be checked using HKS OB-Link.

Combination meter
[Check Engine Light]

×



■Before using SXE10 STARTDATA･･･

When preparing SXE10 STARTDATA, the following throttle sensor voltage and accel sensor voltage input was performed.

Make sure to complete the throttle sensor and accel sensor learning before starting the vehicle set-up.

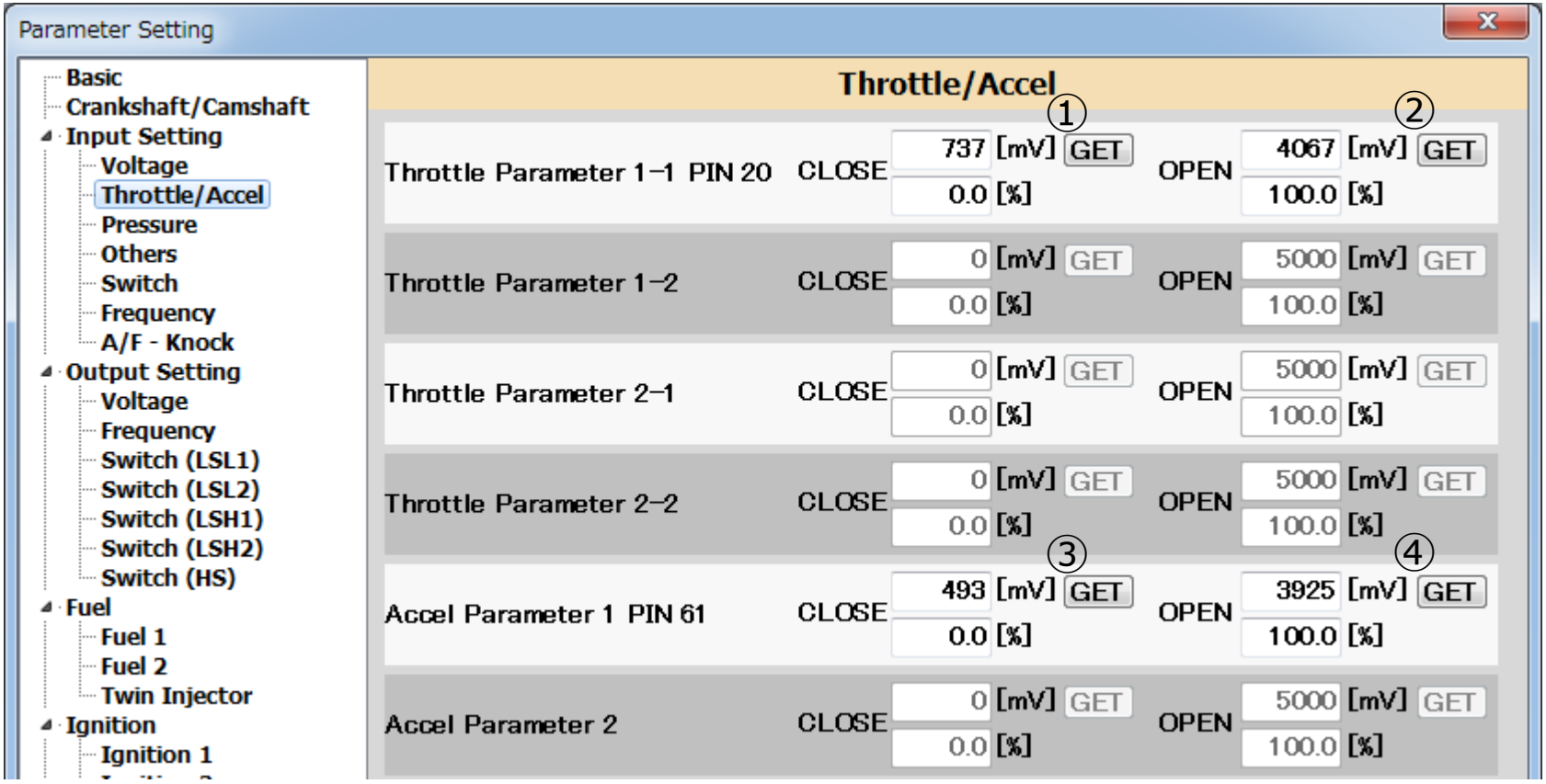
①Turn on the ignition. Check if the power of F-Con unit is on.

②Select “Send All Data” from “Communication” mane.

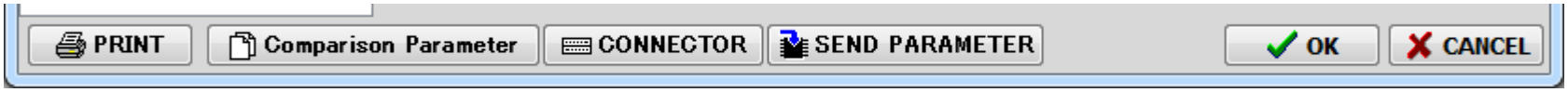
③Click “GET” of CLOSE side (①) in Throttle/Accel under Parameter Setting without acceleration.

④Click “GET” of OPEN side (②) in Throttle/Accel under Parameter Setting while an accelerator is fully opened.

⑤In the same way, make sure to complete accel sensor voltage Parameter Setting(③, ④)



⑥After the throttle voltage learning is completed, click “Send Parameter” or “OK” to return to a normal screen.



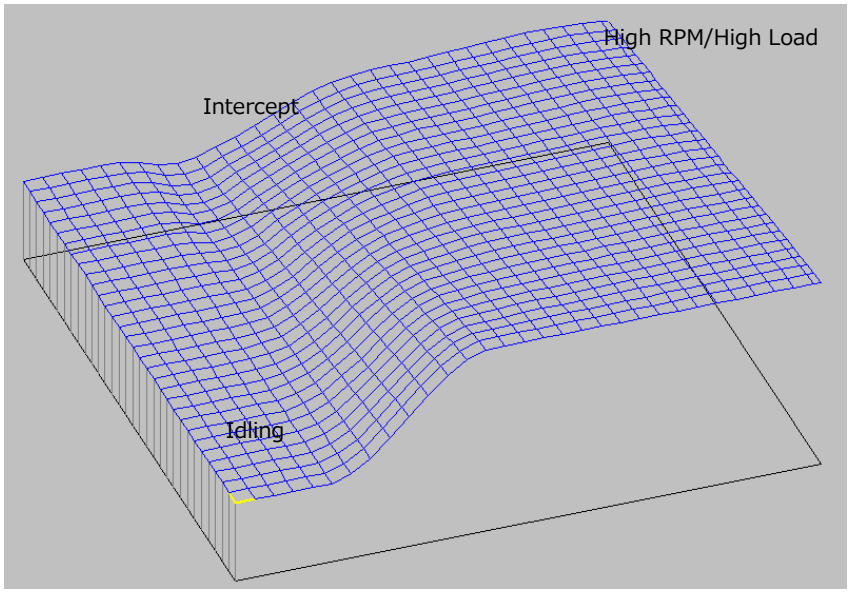
Vehicle Setup Points (Setup on Chassis Dynamo Meter)

■Standard Ignition Time Main Map Based on information from F-CONIS and OBD2(K-LINE), the ignition time map tracing the factory ECU ignition time was prepared to maintain the vehicle condition. (At 2000RPM≒BTDC13, and under high speed & high load area ≒BTDC23)

To prepare STARTDATA, the knocking signal from the factory knocking sensor was confirmed using Oscilloscope, and the vehicle conditions were checked from its output waveform.

This map's values may vary depending on the vehicle's individual difference. Attention must be paid to the vehicle' knocking during setting up the vehicle.

Use the acceleration trim ignition time map and other items that may effect on the engine response as default data. The setup must be performed in accordance with each vehicle characteristics.



Unit Data DATA Inform...

- [F1]Axis Setting
- [F2]Conversion Table
- [F3]Fuel Control
- [F3]Fuel Map 1
- [F3]Fuel Map 2
- [F3]Fuel Map 3
- [F3]Fuel Cut
- [F4]A/F
- [F5]Ignition Control
- [F5]Ignition Map 1
- [F5]Ignition Map 2
- [F6]ISC
- [F7]Boost
- [F8]Valve Timing
- [F9]Option Output

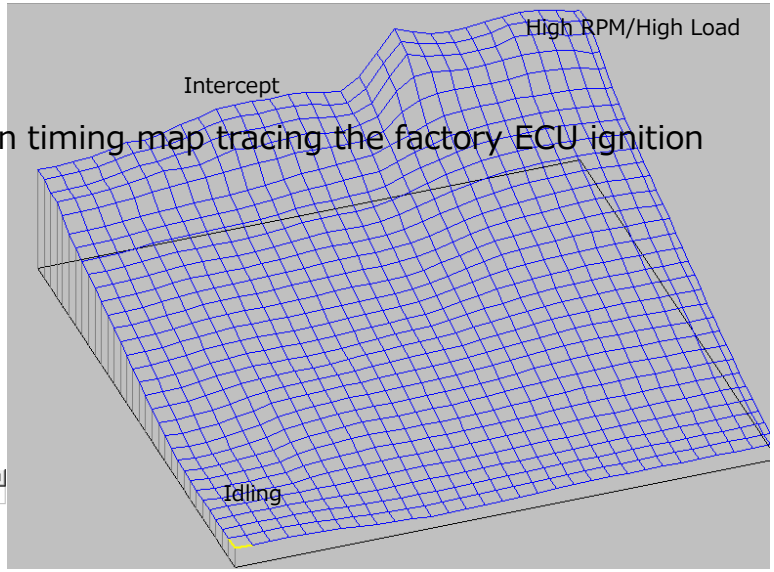
- Ignition Main Map
- Ignition Sub Map
- Idle Ignition Main Map
- Idle Ignition Sub Map
- Main Close Angle Time
- Sub Close Angle Time
- Idex Ignition Timing
- Antilag IGN Cut

	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000	6250	6500	6750	7000	7250	7500	7600
-0.80	31.4	33.6	34.7	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8	34.8
-0.77	31.2	33.3	34.5	34.5	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6	34.6
-0.75	30.6	32.8	33.9	34.0	34.1	34.2	34.2	34.2	34.2	34.2	34.2	34.2	34.3	34.3	34.3	34.3	34.3	34.3	34.3	34.2	34.2
-0.72	30.1	32.2	33.4	33.5	33.6	33.7	33.8	33.8	33.8	33.8	33.8	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.9	33.8
-0.70	29.5	31.7	32.8	33.0	33.2	33.3	33.4	33.4	33.4	33.4	33.5	33.5	33.5	33.5	33.5	33.6	33.6	33.6	33.5	33.5	33.5
-0.67	29.0	31.1	32.3	32.5	32.7	32.9	33.0	33.0	33.0	33.1	33.1	33.1	33.1	33.1	33.2	33.2	33.2	33.2	33.2	33.1	33.1
-0.65	28.5	30.5	31.7	32.0	32.3	32.5	32.6	32.6	32.6	32.7	32.7	32.7	32.8	32.8	32.8	32.8	32.9	32.8	32.8	32.7	32.7
-0.62	27.9	30.0	31.2	31.5	31.8	32.1	32.2	32.2	32.3	32.3	32.3	32.4	32.4	32.4	32.4	32.5	32.5	32.5	32.4	32.4	32.3
-0.59	27.4	29.4	30.6	31.0	31.4	31.6	31.8	31.9	31.9	31.9	31.9	32.0	32.0	32.0	32.1	32.1	32.1	32.1	32.0	32.0	31.9
-0.57	26.9	28.8	30.1	30.5	30.9	31.2	31.4	31.5	31.5	31.5	31.5	31.6	31.6	31.7	31.7	31.8	31.8	31.8	31.7	31.6	31.6
-0.54	26.3	28.3	29.5	30.0	30.5	30.8	31.0	31.1	31.1	31.1	31.1	31.2	31.3	31.3	31.4	31.4	31.4	31.4	31.3	31.2	31.2
-0.52	25.8	27.7	29.0	29.5	30.0	30.4	30.6	30.7	30.7	30.7	30.8	30.8	30.9	30.9	31.0	31.1	31.1	31.0	30.9	30.8	30.8
-0.49	25.3	27.2	28.4	29.0	29.6	30.0	30.2	30.3	30.3	30.3	30.4	30.5	30.5	30.6	30.6	30.7	30.7	30.7	30.6	30.5	30.4
-0.46	24.7	26.6	27.9	28.5	29.1	29.5	29.7	29.9	29.9	29.9	30.0	30.1	30.1	30.2	30.3	30.3	30.3	30.3	30.2	30.1	30.0
-0.44	24.2	26.0	27.3	28.1	28.6	29.1	29.3	29.5	29.5	29.5	29.6	29.7	29.8	29.8	29.9	30.0	30.0	29.9	29.8	29.7	29.6
-0.41	23.7	25.5	26.8	27.5	28.2	28.7	28.9	29.1	29.1	29.2	29.2	29.3	29.4	29.5	29.5	29.6	29.6	29.6	29.5	29.3	29.2
-0.39	23.1	24.9	26.2	27.1	27.7	28.3	28.6	28.7	28.7	28.8	28.8	28.9	29.0	29.1	29.2	29.3	29.3	29.2	29.1	28.9	28.8
-0.36	22.6	24.4	25.7	26.5	27.3	27.9	28.2	28.3	28.4	28.4	28.5	28.6	28.7	28.7	28.8	28.9	28.9	28.9	28.7	28.5	28.4
-0.34	22.1	23.8	25.1	26.1	26.8	27.5	27.8	27.9	28.0	28.0	28.1	28.2	28.3	28.4	28.4	28.5	28.6	28.5	28.3	28.2	28.1
-0.31	21.5	23.2	24.6	25.6	26.4	27.0	27.3	27.5	27.6	27.6	27.7	27.8	27.9	28.0	28.1	28.2	28.2	28.1	28.0	27.8	27.7
-0.28	21.0	22.7	24.0	25.1	25.9	26.6	26.9	27.1	27.2	27.2	27.3	27.4	27.6	27.6	27.7	27.8	27.8	27.8	27.6	27.4	27.3
-0.26	20.5	22.1	23.5	24.6	25.5	26.2	26.5	26.7	26.8	26.8	26.9	27.1	27.2	27.2	27.3	27.4	27.5	27.4	27.2	27.1	27.0
-0.23	19.9	21.6	22.9	24.1	25.0	25.8	26.1	26.3	26.4	26.4	26.5	26.7	26.8	26.9	27.0	27.1	27.1	27.0	26.9	26.7	26.6
-0.21	19.4	21.0	22.4	23.6	24.6	25.4	25.7	25.9	26.0	26.0	26.1	26.3	26.4	26.5	26.6	26.7	26.8	26.7	26.5	26.3	26.2
-0.18	18.9	20.4	21.8	23.1	24.1	24.9	25.3	25.6	25.6	25.6	25.7	25.9	26.0	26.2	26.3	26.4	26.4	26.3	26.1	25.9	25.8
-0.15	18.3	19.9	21.3	22.6	23.7	24.5	24.9	25.2	25.2	25.3	25.4	25.5	25.7	25.8	25.9	26.0	26.0	26.0	25.8	25.5	25.4
-0.13	17.8	19.3	20.7	22.1	23.2	24.1	24.5	24.8	24.8	24.9	25.0	25.2	25.3	25.4	25.5	25.7	25.7	25.6	25.4	25.1	25.0
-0.10	17.3	18.7	20.2	21.6	22.8	23.7	24.1	24.4	24.5	24.5	24.6	24.8	24.9	25.1	25.2	25.3	25.3	25.2	25.0	24.8	24.6
-0.08	16.7	18.2	19.6	21.1	22.3	23.3	23.7	24.0	24.1	24.1	24.2	24.4	24.5	24.7	24.8	24.9	25.0	24.9	24.6	24.4	24.2
-0.05	16.2	17.6	19.1	20.6	21.8	22.8	23.3	23.6	23.7	23.7	23.9	24.0	24.2	24.3	24.4	24.6	24.6	24.5	24.3	24.0	23.9
-0.03	15.6	17.1	18.5	20.1	21.4	22.4	22.9	23.2	23.3	23.3	23.5	23.7	23.8	23.9	24.1	24.2	24.3	24.2	23.9	23.7	23.5
0.00	15.4	16.8	18.3	19.8	21.2	22.2	22.7	23.0	23.1	23.1	23.3	23.5	23.6	23.8	23.9	24.1	24.1	24.0	23.7	23.5	23.3

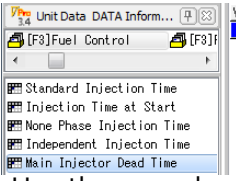
Vehicle Setup Points（Setup on Chassis Dynamo Meter）

■Standard Ignition Time Main Map

Based on information from F-CONIS “F Main Input･Output”, the ignition timing map tracing the factory ECU ignition time was prepared to maintain the vehicle condition.
(At 2500RPM≒9000μSEC, and under high area (nearly the rev limit) ≒11000μSEC afterward.)



The injector opening rate became nearly equal to 70%.
Also, it was confirmed that the value of the AF was about 11.63 under the high RPM and high load area.

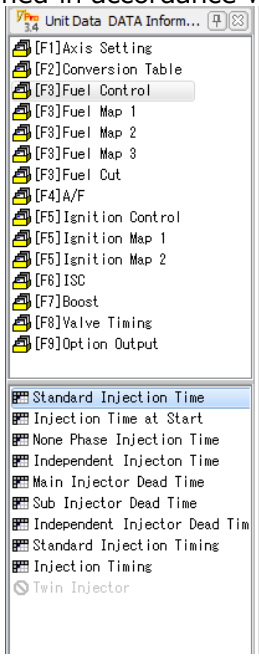


Voltage	5.0	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0	17.0	18.0	19.0	20.0
Time	5000	4000	3000	2000	1625	1250	1100	950	825	700	650	600	550	500	450	400

Considering the injector dead time of the factory injectors, the injector dead time of the injector dead time map was set to be longer, and the total injection time was adjusted in the standard injection time main map.

Use the non-phase injection time map, acceleration trim map (fuel correction), and other items that may effect on the engine response as default data. The setup must be performed in accordance with each vehicle characteristics.

Refer to the manual of F-CON V Pro Ver.3.4 for use of the fuel mapping, etc.

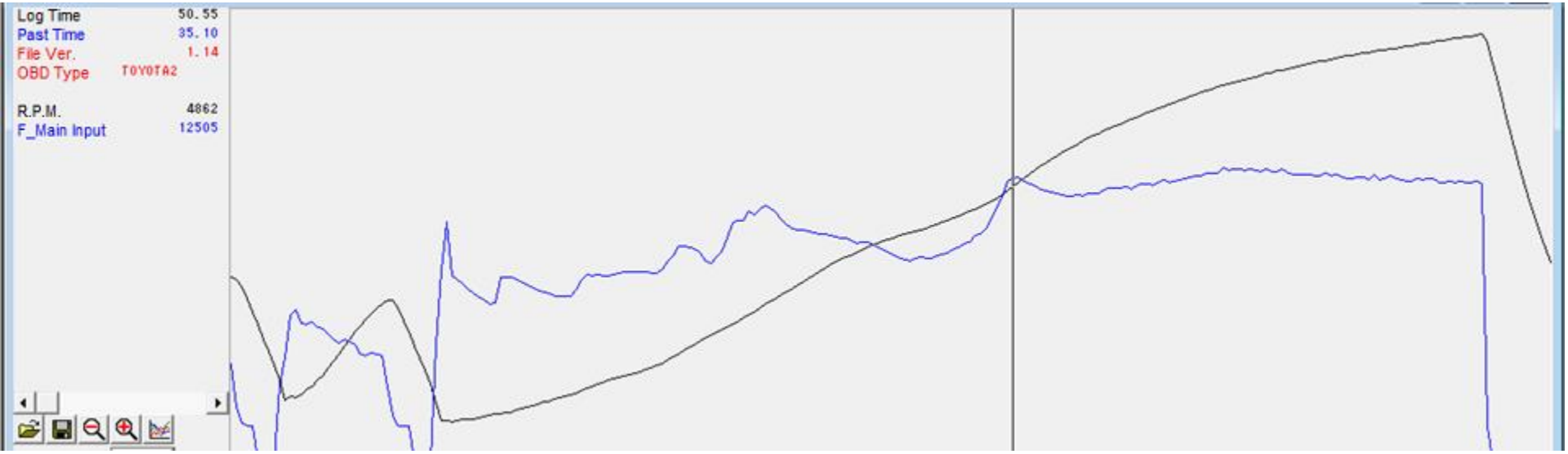


	2750	3000	3250	3500	3750	4000	4250	4500	4750	5000	5250	5500	5750	6000	6250	6500	6750	7000	7250	7500	7600
-0.80	872	876	896	927	960	992	1022	1054	1083	1107	1122	1128	1131	1133	1134	1134	1133	1132	1132	1132	1132
-0.77	926	935	952	976	1003	1030	1057	1084	1111	1133	1146	1153	1156	1157	1158	1158	1158	1157	1157	1157	1157
-0.75	1060	1074	1083	1091	1104	1122	1142	1163	1185	1203	1215	1221	1224	1226	1227	1227	1228	1228	1229	1229	1229
-0.72	1243	1258	1255	1249	1250	1260	1274	1291	1308	1324	1336	1343	1347	1350	1352	1354	1355	1356	1357	1357	1357
-0.70	1458	1465	1451	1436	1432	1438	1450	1467	1486	1504	1518	1528	1535	1541	1544	1547	1548	1549	1549	1548	1548
-0.67	1679	1673	1654	1640	1639	1648	1665	1690	1718	1745	1765	1780	1791	1798	1803	1804	1803	1801	1798	1796	1796
-0.65	1916	1898	1875	1866	1869	1885	1913	1953	1998	2040	2073	2096	2111	2119	2121	2116	2108	2099	2090	2084	2084
-0.62	2153	2131	2108	2104	2114	2140	2182	2241	2308	2371	2420	2454	2474	2480	2475	2461	2441	2422	2405	2394	2394
-0.59	2383	2367	2349	2350	2365	2400	2454	2532	2621	2705	2774	2820	2845	2849	2835	2810	2779	2750	2727	2712	2712
-0.57	2592	2591	2584	2590	2609	2649	2711	2802	2908	3012	3098	3158	3189	3192	3174	3142	3106	3073	3047	3031	3031
-0.54	2784	2806	2817	2832	2851	2888	2951	3047	3162	3279	3379	3452	3492	3502	3487	3457	3422	3390	3364	3348	3348
-0.52	2952	3000	3036	3062	3082	3116	3177	3275	3395	3518	3627	3711	3764	3787	3783	3763	3734	3705	3681	3666	3666
-0.49	3091	3168	3233	3275	3300	3335	3402	3505	3630	3756	3868	3959	4025	4063	4075	4067	4046	4021	3999	3984	3984
-0.46	3210	3303	3387	3442	3477	3525	3613	3739	3879	4011	4125	4220	4293	4343	4367	4370	4357	4336	4316	4302	4302
-0.44	3352	3446	3532	3585	3624	3690	3809	3973	4142	4293	4414	4512	4587	4640	4670	4679	4672	4655	4637	4623	4623
-0.41	3536	3614	3685	3726	3763	3844	3999	4211	4425	4607	4742	4844	4919	4972	5004	5015	5009	4991	4969	4951	4951
-0.39	3778	3840	3885	3900	3923	4010	4191	4445	4709	4933	5094	5205	5282	5337	5372	5385	5379	5355	5322	5292	5292
-0.36	4065	4118	4146	4146	4157	4239	4423	4694	4991	5251	5439	5563	5647	5709	5755	5778	5774	5744	5696	5649	5649
-0.34	4396	4447	4466	4455	4454	4519	4684	4944	5248	5534	5750	5895	5989	6061	6120	6159	6167	6136	6074	6010	6010
-0.31	4727	4785	4812	4803	4796	4842	4981	5217	5510	5805	6042	6209	6316	6396	6466	6521	6542	6512	6442	6363	6363
-0.28	5016	5087	5115	5097	5087	5138	5284	5519	5806	6102	6354	6543	6662	6744	6811	6869	6894	6865	6787	6698	6698
-0.26	5265	5363	5400	5374	5357	5420	5599	5868	6170	6467	6723	6928	7062	7145	7199	7238	7246	7203	7114	7018	7018
-0.23	5513	5640	5688	5653	5628	5713	5942	6264	6596	6902	7157	7367	7505	7584	7618	7632	7616	7552	7444	7335	7335
-0.21	5805	5957	6024	5993	5955	6038	6287	6658	7036	7373	7638	7845	7976	8043	8062	8060	8026	7944	7816	7693	7693
-0.18	6125	6283	6366	6351	6432	6457	6648	7063	7442	7739	8099	8300	8412	8465	8482	8483	8449	8356	8208	8066	8066
-0.15	6473	6634	6737	6751	6836	6937	7011	7467	7871	8220	8629	8724	8833	8883	8905	8912	8878	8775	8614	8457	8457
-0.13	6890	7051	7169	7214	7290	7442	7523	7972	8452	8832	9361	9437	9513	9513	9589	9462	9437	9386	9235	8982	8982
-0.10	7847	7840	8012	7989	7936	7830	7897	8267	9469	10024	10296	10315	10297	10245	10258	10400	10345	10220	10068	9672	9672
-0.08	8204	8320	8345	8469	8192	8070	8330	8640	10232	11045	11154	11003	10876	10876	10969	11055	11015	10876	10608	10182	10182
-0.05	8771	8720	8788	8811	8640	8432	8432	8960	10636	12000	11610	11407	11205	11255	11305	11710	11603	11488	11033	10861	10861
-0.03	9164	9040	9120	9086	8928	8640	8471	9280	10939	12264	11870	11584	11405	11433	11565	11912	11863	11748	11293	11121	11121
0.00	9307	9240	9157	9223	9120	8829	8640	9487	10984	12504	11977	11584	11482	11509	11634	11796	11863	11748	11457	11121	11121

★Actual signal output duration is the sum of (standard injection time x fuel correction) + Injector dead time setting.

Vehicle Setup Points（Setup on Chassis Dynamo Meter)

■Creating the Standard Injection Map (Supplement)



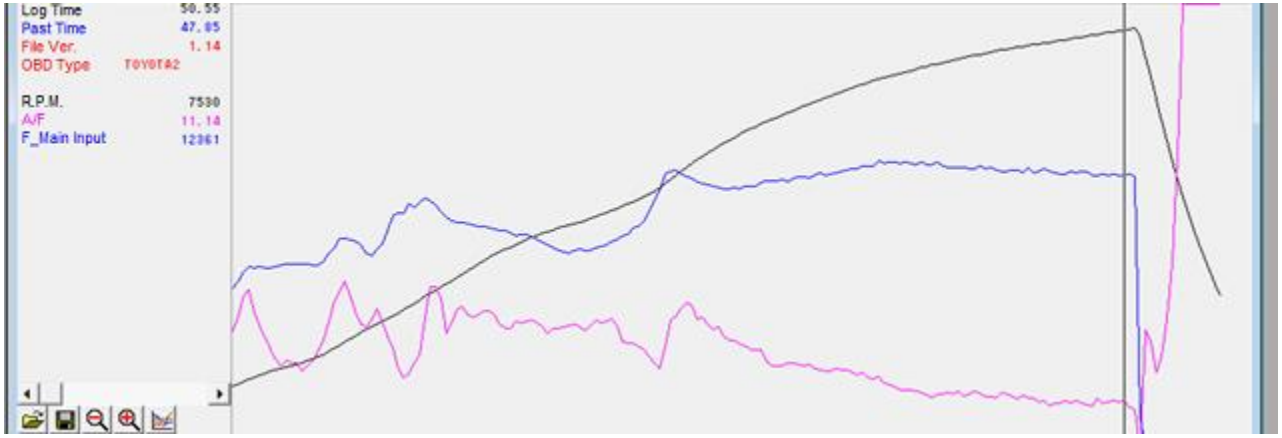
The Standard injection time map on the previous page shows a large spike in injection time around ≒5000 rpm. This is due to the Dual VVT-I acting in this range and the fuelling is increased to suit.

When creating this Start Data, the stock ECU fuel map was analysed using F-Con iS and the stock ECU fuelling also increases fuel injection around 5000 rpm also.

The Start Data map is designed to trace the stock ECU injection map as close as possible.

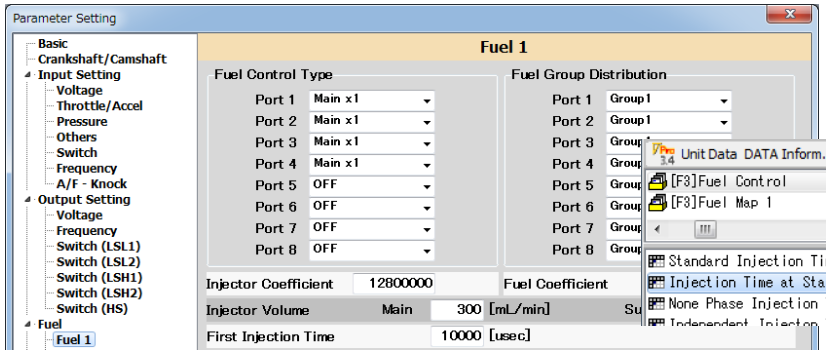
■F-CON iS・ Log Data
This is RPM・Injection Time・A/F comparison log data. The Start Data map has been designed to reflect the stock map as close as possible.

Please reset the map to suit your hardware setup.

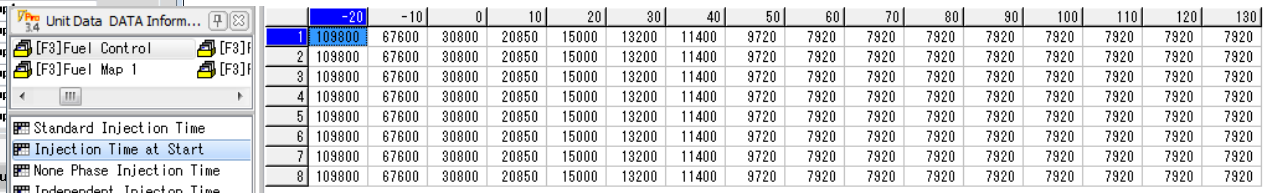


Vehicle Setup Points（Setting Items, etc.）

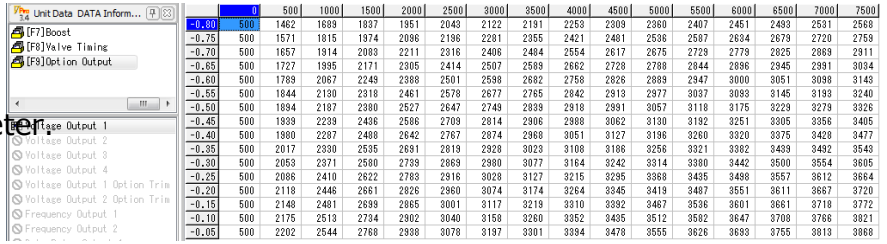
■OTHER

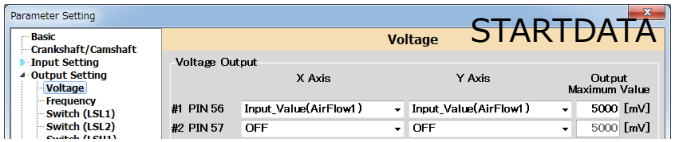


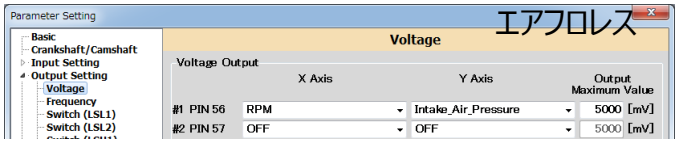
■Fuel control during engine starting has been modified in Parameter･Fuel 1. Whilst there are difference between each vehicle, if the engine is starting to an acceptable level, please retain the default data and continue setup.

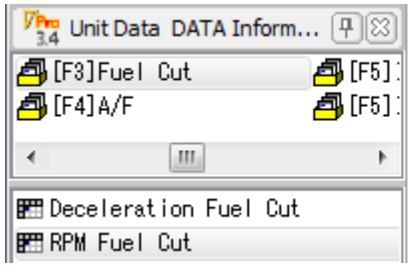


■For the parameter setting for the airflow meter process and wiring modification, refer to page 3.SXE10 STARTDATA
was prepared based on a vehicle equipped with the factory airflow meter.
For the vehicle without the airflow meter, edit the parameter shown in the diagram on the right.
Use “RPM×Pressure” and input a 0~5V signal to suit.







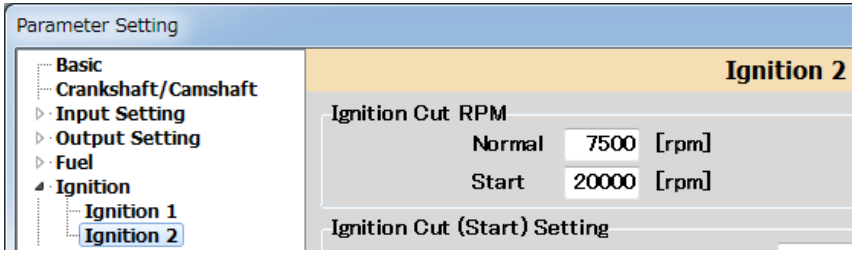


Port	1	2	3	4	5	6	7	8
Cut	7600	7550	7600	7550	20000	20000	20000	20000
Return	7500	7500	7500	7500	20000	20000	20000	20000

■RPM Fuel Cut Map

For those vehicles equipped with the factory CAT or Metal Catalyzer, the rev limiter is controlled by fuel cut.
For STARTDATA, the impact from the fuel cut is reduced by the setting shown above.

For those vehicles without CATs, the rev limiter can be controlled by editing Ignition Cut RPM of Parameter Setting as shown in the diagram on the right. Make sure not to perform this setting for the vehicle equipped with a CAT. If neglected, it may cause damage to a CAT by unburnt gas which results in damage to an engine.



■Speed Limiter Cancel Function (Formula is shown on the right.)
The speed signal setting is done in #1 PIN 45 of Frequency Output Setting under Parameter Setting.
For SXE10 STARTDATA, the following setting was done to cancel the speed limiter.
The speed limiter cancel function is set to activate at 116.7[Hz] by input 116.7 to the output maximum value.
For SXE10 STARTDATA, the output maximum value is set to the value shown above, and the ECU's speed recognition is clipped approximately at 165km.
In Frequency of Input Setting under Parameter Setting, "JIS_Speed" was selected for Option Frequency Input's Frequency 1 PIN 58, and "4" was input for Number of JIS Car Speed Signal Pulse.

■ Formula to Calculate Frequency Input Value

$$F=N\times SPD/5,6515$$

F=Frequency (HZ)
N=Speed Pulse
SPD=Car Speed (KM/H)