



"Fi" System for General purpose

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(1) Injection timing & number per revolution.

To use the Fi system, you should install the sensor for the injection timing pulse in the engine. It is necessary to make this in the beam sensor and the plate. Another method is generating the pulse from "CDI" coil primary current using the signal interface unit (Monkey standard). In first method, you can make it to arbitrary timing.

In the signal generation with the signal interface, the injection trigger is generated 250 micro seconds after from the timing of the ignition. To generate the signal with the signal plate and the beam sensor, it is necessary to make the turning on period in 250 micro seconds or more as shown in the following figures. It is necessary to generate the pulse once every "two crank rotations" to injection once per one combustion for 4 cycle engine. In this case, there is a method of installing the sensor plate to the rotation axis of the camshaft. When the signal unit is used, it is necessary to use it according to the following content.

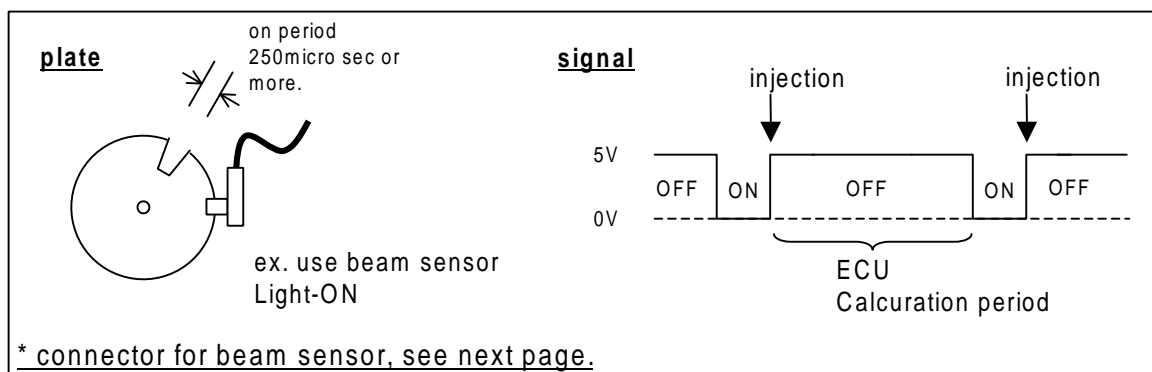


fig. beam sensor and plate for injection timing

(1) One injection timing to One combustion

(a) If you use "Signal interface" to generate timing from CDI,

4Cycle engine - one ignition to every one crank revolution.

>>> signal interface with "once every two times" & standard PC softwear.

4Cycle engine - one ignition to every two crank revolution

>>> signal interface with "every times" & standard PC softwear.

2Cycle engine

>>> signal interface with "every times" & PC softwear for 2Cycle engine.

(b) If you use "Beam Sensor & Plate",

4Cycle engine - one injection to every two crank revolution.

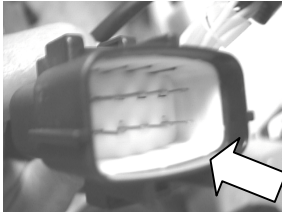
>>> install sensor plate to cam revolution axis & standard PC softwear.

(2) option: 4Cycle engine - If you use two injection timing for one combustion.

>>> timing with one clank revolution & special PC softwear. (Please ask us.)



*** Connector for beam sensor**

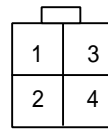


View of this side.

connector of sensor side.

male contact.

#5 4PINs Connector (KIT)



- 1. Signal out of sensor
- 2. GND (0V)
- 3. +12V
- 4. Not use

* Please refer to the document of the sensor for the color of sensor wiring.

(2) Calibration of Throttle Sensor.

Throttle sensor calibration is very important for "Fi" system.

How to adjust a throttle sensor is explained in the chapter of "Setting of close values and full open value of throttle sensor " in a manual.

If you received the throttle body from us at the same time, we already have set sensor range & injector capacity to the ECU.

(3) Fuel pump control

The pressure of fuel is required for fuel injection. The in-line pump is controlled from ECU.

In order to suppress useless consumption of a battery, intermittence according to required quantity is driven in the low rotation speed domain. The PWM drive is performed in the high rotation speed domain. It is possible to perform a setup of a drive from PC connected with ECU.

*ECU is not measuring the pressure of fuel. Please set up the parameter of ECU, looking at the pressure gauge attached to this products ("Fi System set") so that required pressure may be obtained.

* if you don't use pump control, It is necessary to install the dummy resistance to pump wiring.



the dummy resistance.

ECU controls "pump drive according to "Injector capacity" & sum of Injected time. if you change "Injector Capacity", pump drive timing will be change. (in intermitance drive.)

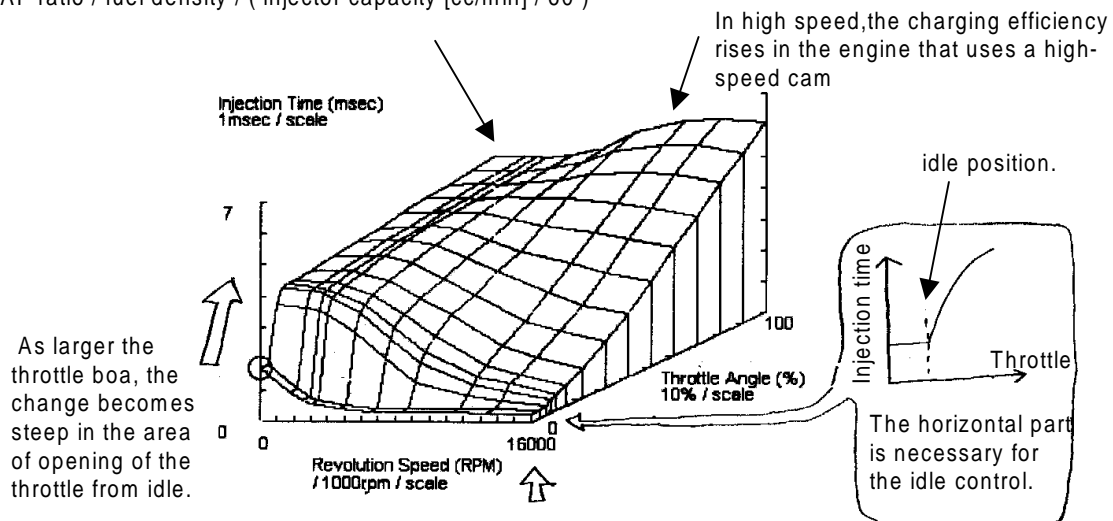


(4) About injection control method.

In standard "Alpha-N" version, ECU controls a injection time according to the intake air volume estimated with two parameters, "the open angle of throttle" and "engine speed". In the version of "alpha-N", the response of the engine is better than other versions. However, the control of this version needs the adjustment of the map when there are a secular distortion and a condition change, compared with the control of the type that measures the amount of air directly. We also have ECU that controls the following types.

- * D-Jetronic (Speed Density Type,normal,turbo)
- * Alpha-N with Boost Compensation

$$\text{Injection Time(WOT) [sec]} = \frac{\text{air charging efficiency [\%]} / 100 * \text{engine displacement [cc]} * \text{air density}}{\text{AF ratio} / \text{fuel density} / (\text{injector capacity [cc/min]} / 60)}$$



When becoming over 16000 rpm, ECU controls a Injection time by the parameter of 16000 rpm.



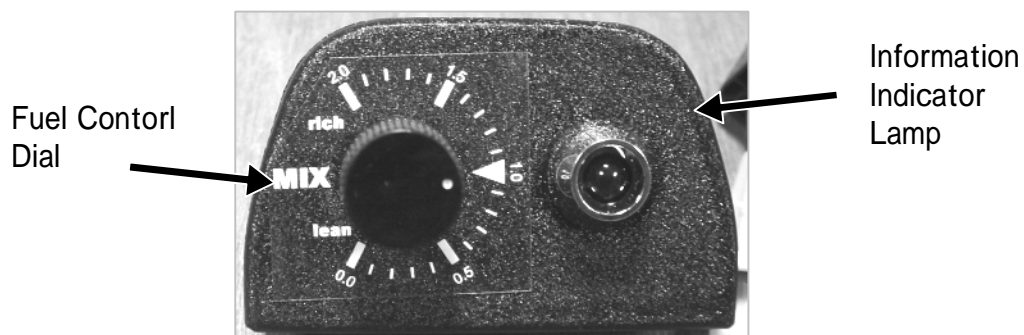
(5) Dial Controller

The "Dial Controller" is equipped with the dial which can increase or decrease injection time (whole map) temporarily, and the lamp which displays the information on ECU.

It is possible to change injection time in the quite big range from 0.1 times to 1.9 times by the dial. A left rotation side is the direction of "rich" (upper scale 1-1.9 time), and a right rotation side is the direction of "lean" (lower scale 0.1-1 time). The minimum scale is 0.1.

Injection map doesn't change though this Dial, but actual injection time is changed.

If you don't use "Dial Controller", change "Dial Controller" setting "Disable" to the ECU from PC software. (Compensation tab)



(6) Temperature sensor

ECU calculates "Startup Injection time", "Startup compensation", "Warm-up Compensation", "Fuel cut RPM" according to the value of temperature sensor.

If you don't use these compensation, please don't remove the temperature sensor. You can invalidate these compensation in ECU from PC software. You can't invalidate "Startup Injection time" & "Fuel cut RPM". If you want to invalidate, please set these setting table "flat" to the sensor value.

Temperature sensor element is NTC thermistor. The absolute value is not accurate enough in the use for the measurement etc. though the accuracy of the sensor is suitable for the control.

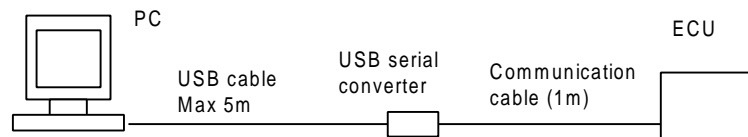


(7) Communication cable

The length of the communication cable is about 1m. Please use a straight serial cable when it is extended (extend 1m MAX). The communication error might occur when the extension cable is lengthened too much.

In addition, we will recommend to use "USB serial converter" on the market, between PC and the communication cable to lengthens it.

(* Please use USB serial converter when you use PC without the serial port.)



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