Kawasaki

Ninja ZX-6R
Ninja ZX-6RR
Ninja ZX-10R

Kawasaki FI Calibration Tool
Instruction Manual

IMPORTANT

This manual provides how to change the fuel injection amount, sub-throttle opening, and ignition timing of the racing ECU for the 2004 Ninja ZX-10R, 2005 Ninja ZX-6RR/ZX-10R, 2006 Ninja ZX-10R and 2007 Ninja ZX-6R. This manual instructs the dealing method briefly for the mechanic and being familiar with the personal computer (PC).

As for the basic knowledge, refer to the base Service Manual for the Ninja ZX-6R, ZX-6RR and ZX-10R.

  ZX600-N1: P/No. 99924-1346-01
  ZX1000-C1/C2: P/No. 99924-1322-01/02
  ZX1000D6F: P/No. 99924-1365-01
  ZX600P7F: P/No. 99924-1382-01

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For Kawasaki FI Calibration Tool

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Contents

1. Kawasaki FI Calibration Tool Outline

1.1 System Function

Kawasaki FI Calibration Tool (FI Tool) is developed to modify the mapping of the racing machine to gain operating conditions suitable for the course and the rider's skill. The following are the available setting functions.

Table 1 FI Tool Function

Model Name / Functions	Available Setting Range	'04 ZX-10R	'05 ZX-6RR	'05 ZX-10R	'06 ZX-10R	'07 ZX-6R
1) Adjust the injected fuel rate at acceleration	-30 % ~ +30 %	○	○	○	○	○
2) Adjust the injected fuel rate of No.1 and No.4 cylinder	-30 % ~ +30 %	○	○	○	○	○
3) Adjust the injected fuel rate of No.2 and No.3 cylinder	-30 % ~ +30 %	○	○	○	○	○
4) Adjust the injected fuel rate of primary and secondary injector*	-30 % ~ +30 % -10 % ~ +10 %	-- --	-- ○	-- --	-- --	-- ○
5) Adjust the ignition timing	-15°CA~ +5°CA	○	○	○	○	○
6) Adjust the sub-throttle opening angle	-50 % ~ +50 % -45 % ~ +45 %	○ --	-- ○	○ --	○ --	-- ○
7) Adjust the exhaust device opening angle	-50 % ~ +50 %	○	--	○	○	--
8) Adjust the all injected fuel rates of all cylinders and operating area simultaneously	-30 % ~ +30 %	○	○	○	○	○
9) Adjust the value of engine over revolution limiter	0 ~ +300 rpm -1000 ~ +700rpm -1000 ~+1200rpm	-- -- --	○ -- --	-- ○ --	-- -- ○	○ -- --
10) Set the fuel cut or not at deceleration	Use or Not Use	○	○	○	○	○
11) Set the sub throttle controlled or not	Controlled or Full Open Fixed	○	--	--	--	--
12) Set the exhaust device controlled or not	Controlled or Full Open Fixed	○	○	○	○	○
13) Set the Auto Shifter Ignition Cut Length	Controlled or not, set Ig. Cut Time by gear range	--	--	○	○	○
14) Set the Pit Road RPM Limit	Controlled or not, set Upper Limit RPM by gear range	--	--	○	○	○

15) Revolution increase/decrease of outside shift indicator	Controlled or not, set the revolution	--	--	○	○	○
16) Gear ratio of Kit Transmission	Use or not use, set the gear ratio	--	--	--	○	○

Note: ○ mark shows the model has the function.
Note: * +: primary injector rate down and secondary injector rate up.
　　　 -: primary injector rate up and secondary injector rate down.
Note: CA shows rotating angle of crankshaft.

1.2 Personal Computer (PC) Requirement

　　The Kawasaki FI Calibration system operates on a Personal Computer (PC) having a serial communication port with the racing electronic control unit (ECU) on the motorcycle through an interface box (I/F Box).

Table 2　PC Requirement

Items	Recommendation
Operating System	Windows XP (US version, Japanese version)
CPU	Pentium 150 MHz or faster
Memory	64 MB or more
Hard Disk Drive	2 MB or more of free space
Display Resolution	1024 x 768 pixels or more, more than 256 colors
Port Connector	RS232C (D-sub 9 pin), I/F Box cable can be connected to COM 1 ports
Other	Equipped with a mouse or a pointer equivalent to mouse

NOTE

Even if the recommended PC is used, the Kawasaki FI Calibration Tool program could not operate correctly depending on the other applications installed to the PC.
If your PC does not equip 9-pin connector, use a suitable RS232C-USB adapter. Some adapter cannot be communicated correctly depending on its specification.

1.3 System Configuration

The Kawasaki FI Calibration tool kit consists of (1) Racing ECU, (2) Racing Main Harness or Standard Harness plus Racing Sub-harness, (3) I/F Box, and (4) Setting Program. The Setting Program must be installed to your PC.
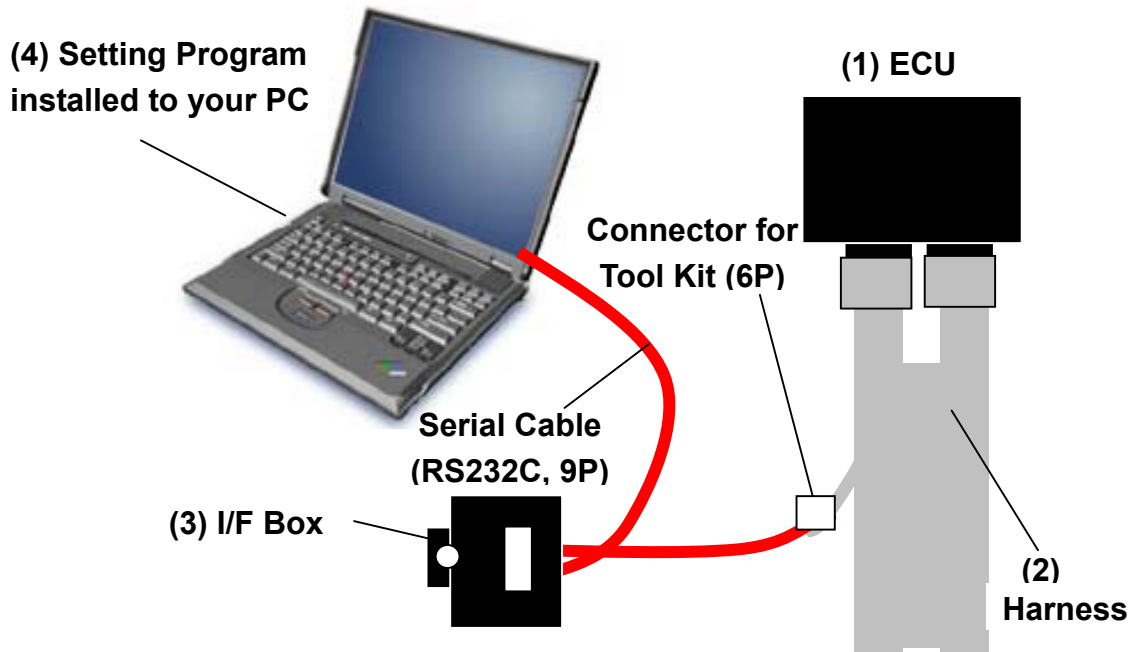

Fig. 1 Setting Tool Connection

Table 3 Setting Tool for 2006 Model

	ZX-6RR		ZX-10R	
Meter Type	Optional Meter	Original Meter	Optional Meter	Original Meter
(1) ECU	Racing ECU P/No. 21175-0074		Racing ECU P/No. 21175-0096	
(2) I/F Box	Racing I/F Box: P/No. 26031-0025 or 26031-0240. Whichever is available			
(3) Harness	Racing Main Harness 26031-0325	① Racing Main Harness 26031-0326 or ② Racing Sub-harness 26031-0327 plus Std. Main Harness 26031-1058	Racing Main Harness 26031-0425 plus Sub-harness 26031-0307	① Racing Main Harness 26031-0426 plus Sub-harness 26031-0308 or ② Racing Sub-harness 26031-0427 plus Std. Main Harness 26031-1058
(4) Shift SW	--	--	Contact type of SW can be used. Recommend the Shift Sensor made by Battle Factory or Dynojet.	
(5) Setting Program	CD or FD			

Table 4 Setting Tool for 2007 Model

Meter Type	ZX-6R	
	Optional Meter	Original Meter
(2) ECU	Racing ECU P/No. 21175-0145	
(2) I/F Box	Racing I/F Box: P/No. 26031-0025 or 26031-0240. Whichever is available	
(3) Harness	Racing Main Harness 26031-0559	①Racing Main Harness 26031-0558 or ②Racing Sub-harness 26031-0039 plus Std. Main Harness 26031-0561
(4) Shift SW		
(5) Setting Program	CD or FD	

NOTE: The detail of connecting method is shown in section 5.1.

NOTE: See '04 and '05 instruction manual for '05 models setting tools.

2. Installation Procedure of Setting Program

Program files will be supplied to users through Internet from "**kawasakidirect**". Download the Software "**Kawasaki FI Calibration. EXE**" to your PC and uncompress to suitable folder

NOTE

○ *Before installing the new Setting Program to the PC in which old version Program is installed, save the old .est files as back-up and then un-install the previous Program.*

2.1 Installing Procedure

(1) Execute **Setup.exe** to start the Setup program.
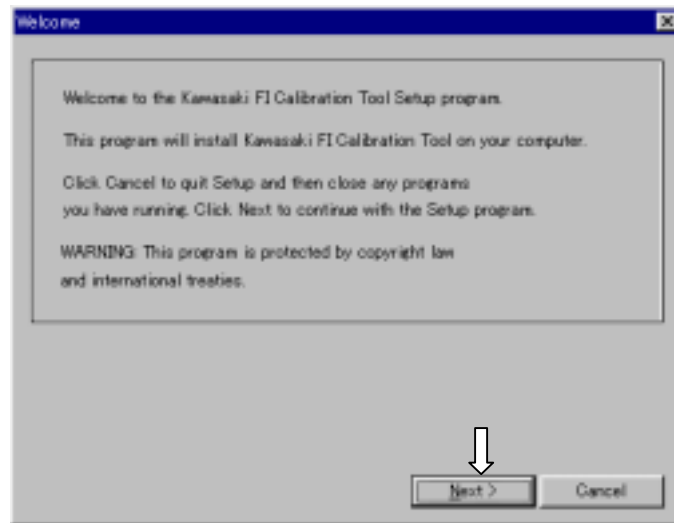
(2) Then the screen shown in Fig. 2 appears.

Fig. 2 Setting Screen of Setup Program

Click **Next** to install the Program. Click **Cancel** to stop installing procedure.

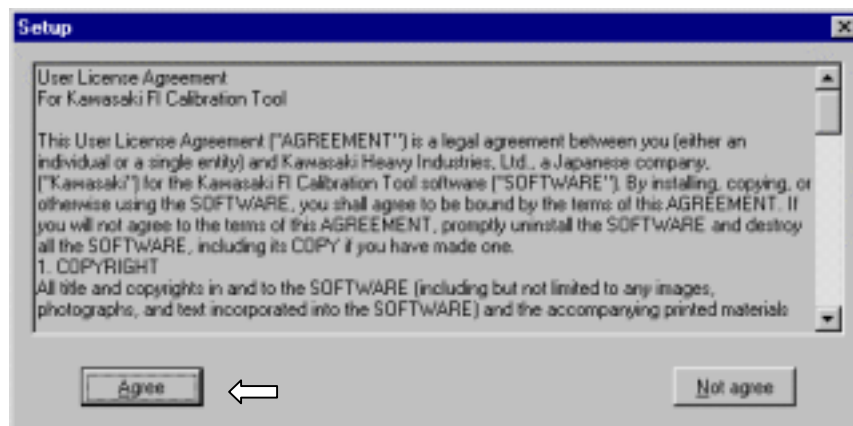(3) The Product License Agreement screen shown in Fig. 3 appears.

Fig. 3 Product License Agreement

Click **Agree** when you agree to the Product License Agreement. Click **Not agree** when you do not agree to the Product License Agreement. Then the installing procedure is stopped.

(4) Next the Serial Information screen shown in Fig. 4 appears.
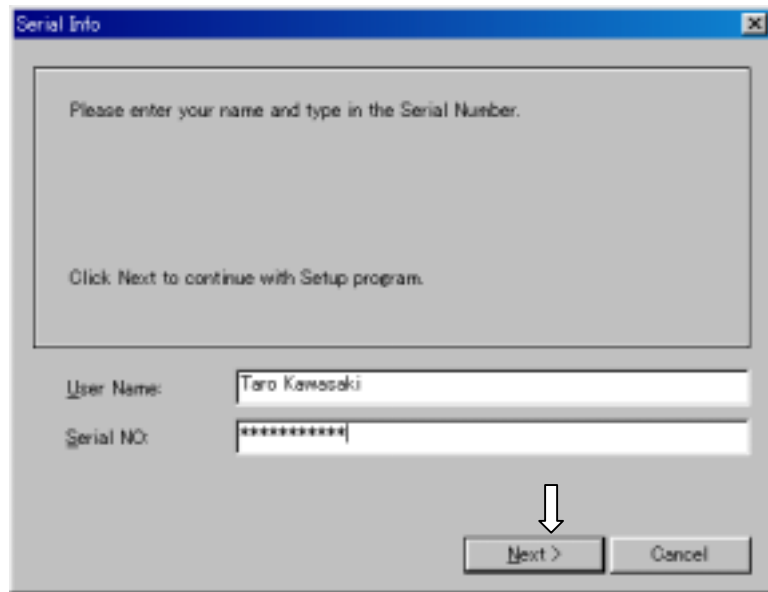   Enter the information in both columns.

Fig. 4 User Information Registration / Authentication (Sample)

The Serial No is informed to you from the dealer.
The default settings of **User Name** and **Serial No** are vacant.
If you omit any of them, **Next** button is grayed out.

When the Serial No is wrong, an error message shown in Fig. 5 appears on the screen. Input the correct Serial No in the column.
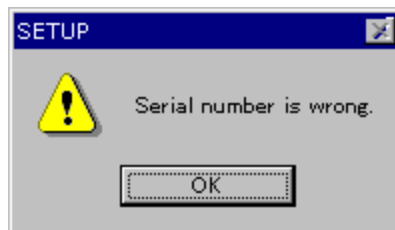

Fig. 5 Error Message

Click **Next** to install the Program. Click **Cancel** to stop the installing procedure.

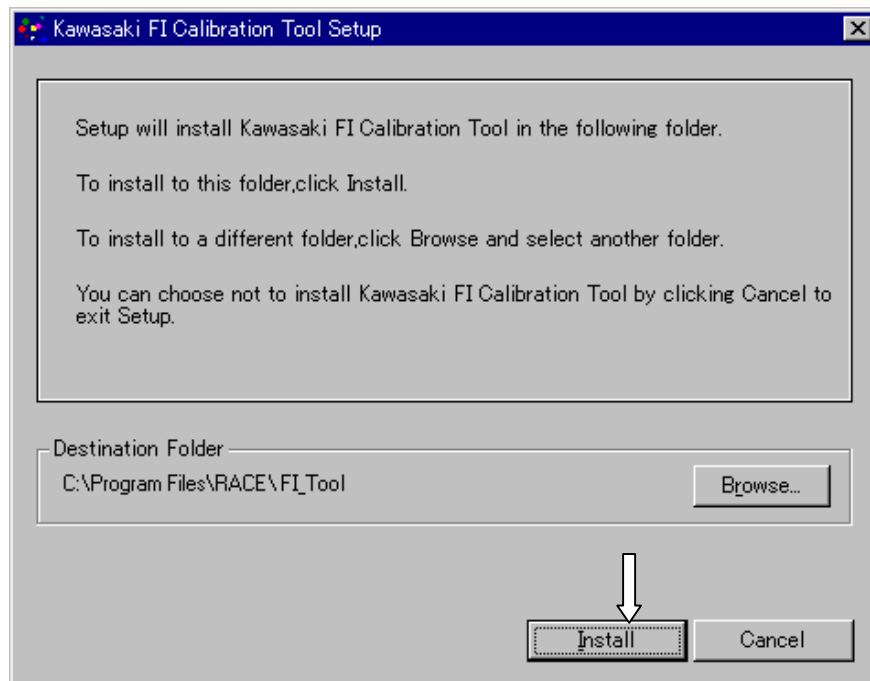(5) The destination folder selection screen shown in Fig. 6.appears.

Fig. 6 Choosing Destination Folder

Choose the destination folder. The default setting is **C:\Program Files\RACE\ FI-Tool**.

If you want to install the Program to another folder, click the **Browse** button to display the **Choose Folder** screen shown in Fig. 7. Then choose the folder.
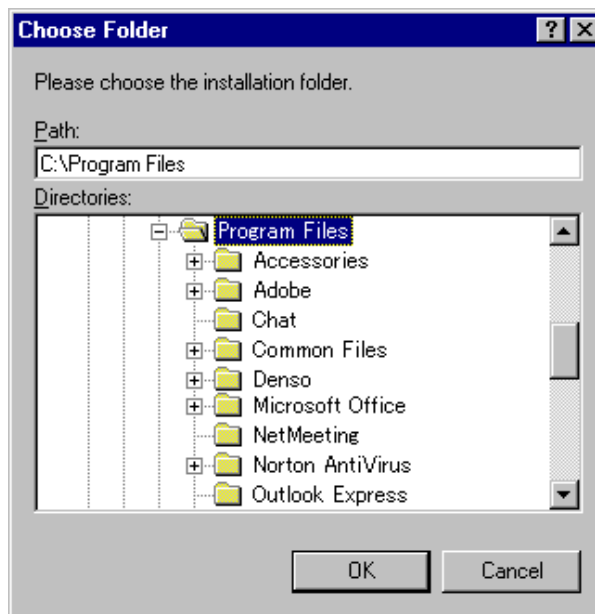

Fig. 7 Choose Folder Screen

Click **Install** to start the installing procedure. Click **Cancel** to stop the installing procedure.

(6) After the **Kawasaki FI Calibration Tool program** is installed, the Setup finish screen shown in Fig. 8 appears.

Fig. 8 Setup Finish Screen

If the destination folder has a file that has the same name of the file to be copied and whose time stamp is newer than that for the file to be copied, the message screen shown in Fig. 9 appears and the file cannot be copied. However, the installing procedure is normally finished because the destination folder has the new data file with newer time stamp.
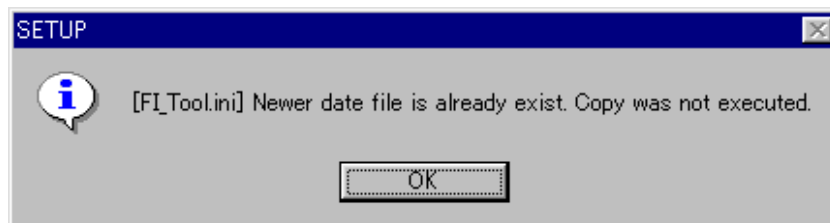

Fig. 9 Message Dialog when overwriting was not performed

(7) Click **OK** button to finish the setup. After the setup is finished, the shortcut icon for **Kawasaki FI Calibration Tool** program is registered on both the Desktop and the Start Menu.

Click **Cancel** during the setup operation to quit the setup.
(8) Before starting **Kawasaki FI Calibration Tool**, restart your PC.

2.2 File Structure

・ Files to be copied into a destination folder

FI_Tool.exe	Program file
FI_Tool.bmp	256-color splash screen file
FI_Tool FC.bmp	Full-color splash screen file
MCN_LIST.DAT	
Setup.exe	Uninstall file for execution

・ Files to be copied into the ZX600P folder under the destination folder.

FI_Tool.ini	Setting file for FI_Tool.exe of ZX600P
FI_Tool.stz	ZX600P Configuration File

・ Files to be copied into the ZX600P Work Folder

Standard_data.est	Data file for only ZX600P

・ Files to be copied into the ZXT00C folder under the destination folder.

FI_Tool.ini	Setting file for FI_Tool.exe of ZXT00C
FI_Tool.stz	ZXT00C Configuration File

・ Files to be copied into the ZXT00C Work Folder

Standard_data.est	Data file for only ZXT00C

・ Files to be copied into the ZXT00C2 folder under the destination folder.

FI_Tool.ini	Setting file for FI_Tool.exe of ZXT00C2
FI_Tool.stz	ZXT00C Configuration File

・ Files to be copied into the ZXT00C2 Work Folder

Standard_data.est	Data file for only ZXT00C2

・ Files to be copied into the ZX600N folder under the destination folder.

FI_Tool.ini	Setting file for FI_Tool.exe of ZX600N
FI_Tool.stz	ZX600N Configuration File

・ Files to be copied into the ZX600N Work Folder

Standard_data.est	Data file for only ZX600N

・ Files to be copied into the ZXT00D folder under the destination folder.

FI_Tool.ini	Setting file for FI_Tool.exe of ZXT00D
FI_Tool.stz	ZXT00D Configuration File

・ Files to be copied into the ZXT00D Work Folder

Standard_data.est	Data file for only ZXT00D

2.3 Uninstalling Procedure

Uninstalling operation can be executed on the **Add/Remove** service application in the **Control Panel**.

(1) Open the **Control Panel** screen from **My Computer** or **Explorer** screen.

Fig. 10 Control Panel Screen

Then click the **Add/Remove** icon.

(2) Add/Remove Programs Properties screen appears.

Fig. 11 Add/Remove Programs Properties screen

Click **FI Calibration Tool** and then click **Add/Remove** to start the Setup program.
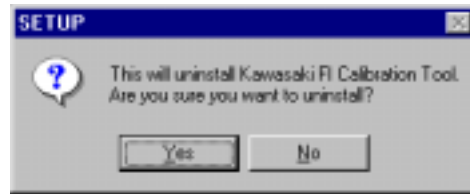
(3) The screen shown in Fig. 12 appears.

Fig. 12 Uninstall Starting Screen

Click **Yes** to start the uninstalling procedure.

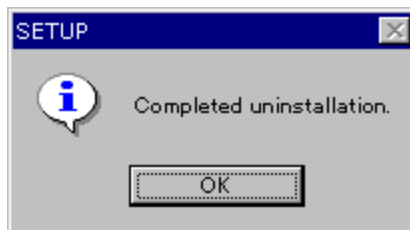(4) After the uninstallation is completed, Uninstall Completion screen shown in Fig. 13 appears.

Fig. 13 Uninstall Completion Screen

If you tried to delete the program but you couldn't do it due to some reason (ex. the program is starting), the message shown in Fig. 14 appears. In such case, delete the files remaining in the screen folder by yourself.
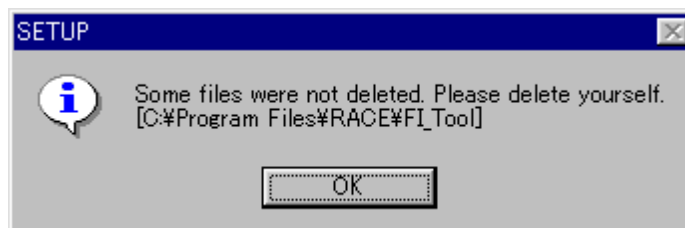

Fig. 14 Message Dialog when some files were not deleted

(3) Click **OK** button to complete the uninstalling procedure.
In this step, setup.exe is left in the FI Calibration Tool folder, but it will be deleted when you start the PC next time.

NOTE

When restarting after uninstallation is finished, the DOS window may remain open. (It occurs on Windows98.) At that time close the window by yourself.

3. Operating the Program

3.1 Starting

(1) Double-click the shortcut icon **Kawasaki FI Calibration Tool** on the Desktop screen or click the **Kawasaki FI Calibration Tool** in Program Menu on Start Menu.

(2) Then Machine Select screen shown Fig. 15 appears.

Fig. 15 Machine Select Screen

Click the target machine name, then click **OK** button or press **Enter** key.
If you want to stop, click **Cancel** button.

(3) The initial screen shown in Fig. 16 appears.
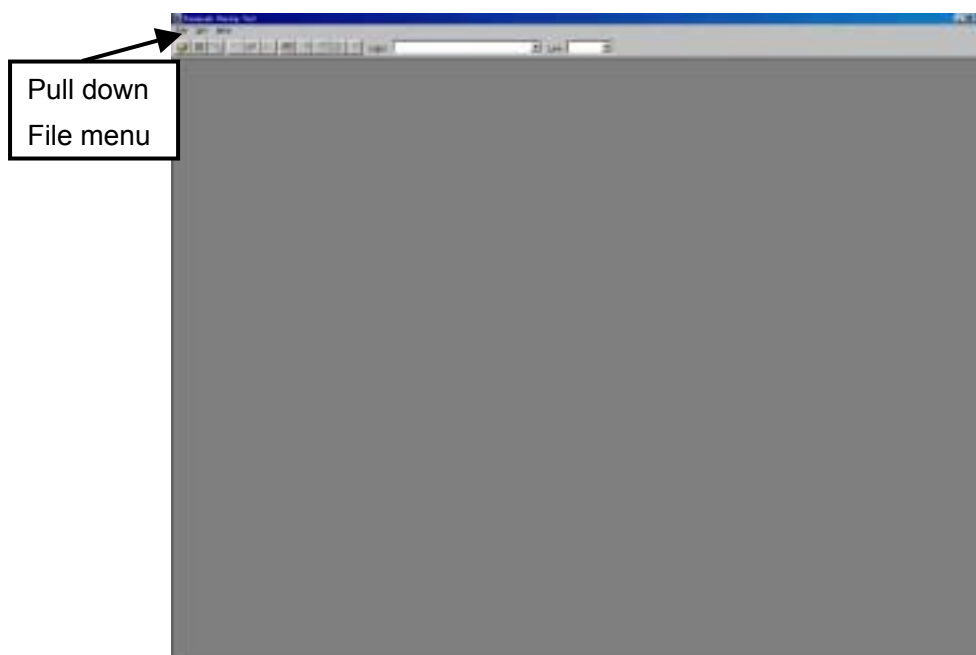

Fig. 16 Initial Screen

It starts to load the data file (EST file) to be edited on the initial screen.
Go to the pull-down **File** menu and select **Open**, or click the **File** ‐ **Open** icon (left end) on the toolbar.
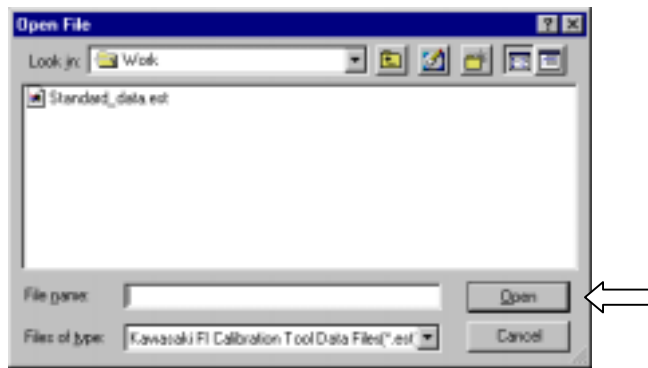
(4) The Open dialog shown in Fig. 17 appears.

Fig. 17 Open Dialog

Click the data file to be edited in the Open dialog screen. The selected data file name is shown in the File name. Then click the **Open** button.

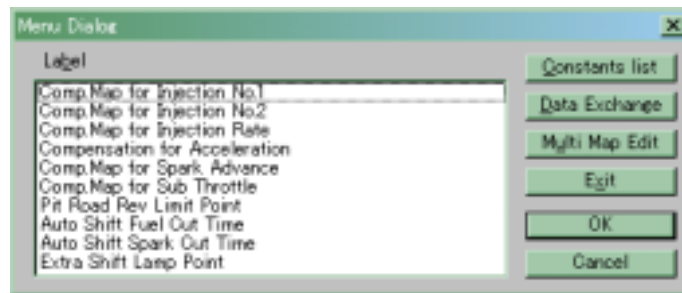(4) The Menu dialog screen shown in Fig. 18 appears.

Fig. 18 Menu Dialog (in case of ZX600P)

Select the mode to be edited in the Menu dialog.

The modes that can be used are as follows:

<Map Edit> Mode (in case of ZX600P)

In this Mode you can edit the "Compensations" below.

Click one **Label** in the Menu dialog and click the **OK** button or **Enter** (Return) button, or double click one **Label**, to display the Map Edit screen.

"**Comp. Map for Injection No.1**": Regulate the rate of fuel injection at normal operation (For the #1 and #4 cylinders)

"**Comp. Map for Injection No.2**": Regulate the rate of fuel injection at normal operation (For the #2 and #3 cylinders)

"**Comp. Map for Injection Rate**": Regulate the rate of primary and secondary fuel injection

"**Compensation for Acceleration**": Regulates the rate of fuel injection at acceleration

"**Comp. Map for Spark Advance**": Regulate the ignition timing

"**Comp. Map for Sub Throttle**": Regulate the sub-throttle opening

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"**Pit Road Rev Limit Point**" : Regulate the pit road limit RPM

"**Auto Shift Fuel Cut Time**" : Regulate the ignition cut time at auto shifting

"**Auto Shift Spark Cut Time**" : Regulate the Spark cut time at auto shifting

"**Extra Shift Lamp Point**" : Regulate the shift indicate RPM

\<Setting Values Edit\> Mode

In this Mode you can edit the nine Values below.

Click the **Constants list** button to display the Setting Values Edit screen.

"**All Area Fuel Compensation Value**": Regulate the rate of fuel injection for all operating ranges

"**OverRev shift Value**": Regulate the off-set value from the standard OverRev Limiter

"**Select Fuel Cut [Use: 0 / Not Use: 1]**": Set the fuel-cut at deceleration

"**Select Sub-throttle [Controlled: 0 / Full Open Fixed: 1]**": Set the sub throttle control

"**Select Exhaust Valve [Controlled: 0 / Full Open Fixed :1]**": Set the exhaust valve control

"**Select Auto Shifter [Use: 0 / Not Use: 1]**": Set the auto shifter control. **ZXT00C2, ZXT00D only**

"**Select Pit Road RPM Limit [Use: 0/ Not Use: 1]**": Set the pit road RPM limit control. **ZXT00C2, ZXT00D, ZX600P only**

"**Select Extra Shift Indicator [Use: 0 / Not Use: 1]**": Set the shift indicator control. **ZXT00C2, ZXT00D, ZX600P only**

Set when option meter is equipped.

"**Select Gear Ratio" [Std: 0 / Kit Transmission: 1]**" Set the gear ratio: ZXT00D only.

Set "1" when the kit transmission is equipped.

\<ECU Data Exchange\> Mode

Click the **Data Exchange** button in the Menu dialog to display the Data Exchange screen. Click this button when you want to load the data in the ECU or write the edited data in the ECU.

\<Multi Map Edit\> Mode

Click the **Multi Map Edit** button in the Menu dialog to display the Multi Map Edit screen.

The Multi Map Edit can be used for the "**Comp. Map for Injection No.1 and No.2**" and map edit for all cylinders can be carried out at the same time.

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3.2 Each Map Edit Method
3.2.1 Map Edit

Select one Label in the Menu dialog and click the **OK** button or the **Enter** (Return), or double click one Label to display the Map Edit Screen shown in Fig. 19.
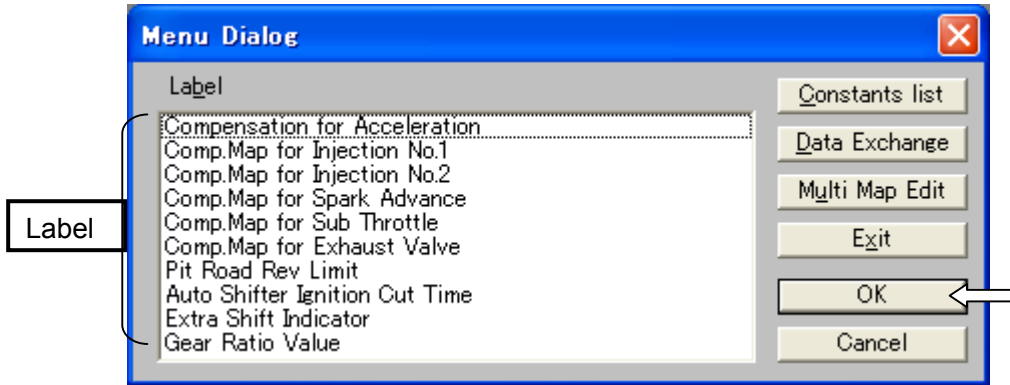

Fig. 19 Menu Dialog

In the Map Edit Screen, the Map to be edited will be displayed as the two-dimensional graph (GRAPH) and the table (TABLE).
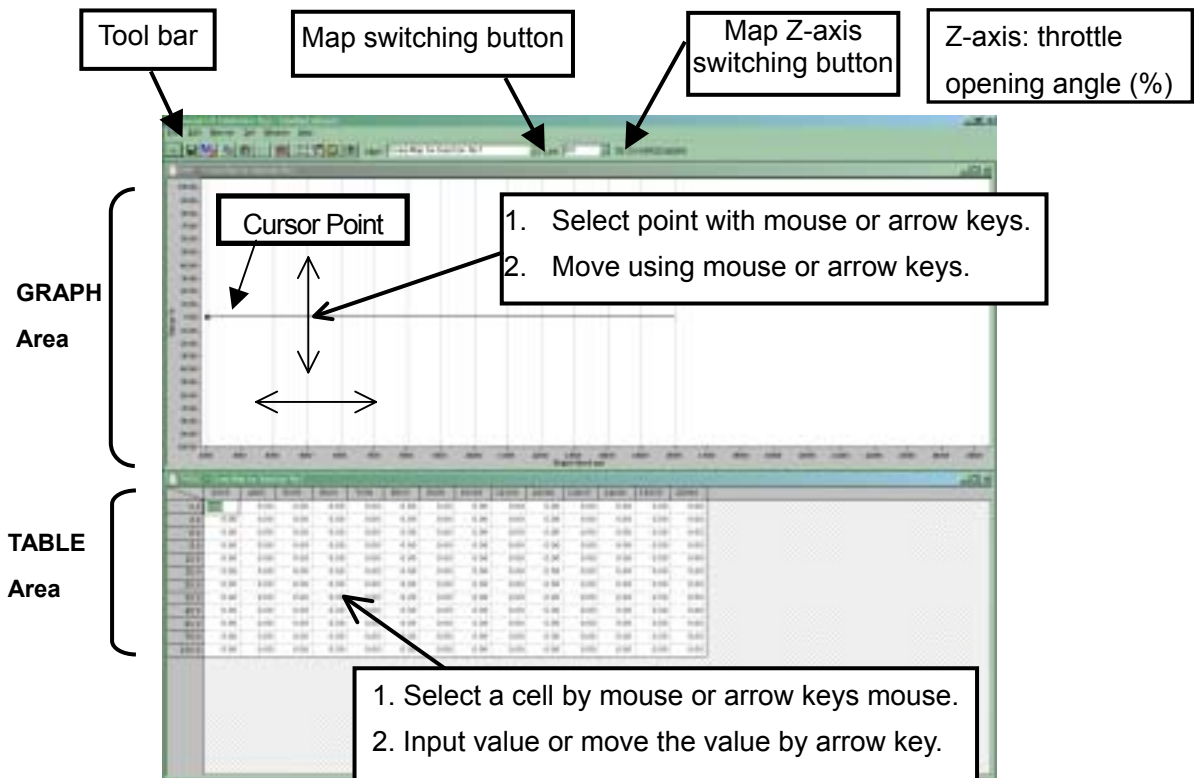

Fig. 20 Map Edit Screen (Compensation Map for Injection No.1 is shown as a sample.)

NOTE

If you closed the GRAPH or TABLE, open the Menu dialog on the Menu button of the Tool bar and select the subject Map.
If you switched the subject Map using Map switching button, only the display switches. When editing the subject Map, switch the Map by selecting the editing point of the Graph or Table area of the subject Map.

Data Edit can be carried out either in the **GRAPH** or **TABLE** area and the editing method for each area is as follows:

[Editing method on the GRAPH area]

Click a point on the graph to select the graph and the editing point of the engine rpm that is the nearest position to the clicked point.

Drag & drop of the graph data: Press down the left button of the mouse to select the editing point. After that, move the editing point up or down. Then, the data will be changed to the possible setting value nearest to the release point. (The direction of the engine rpm cannot be changed.)

Key allocation when a point on the line is selected

→ (or {Shift} + →): Switches the selected point to the right-side rpm

← (or {Shift} + ←): Switches the selected point to the left-side rpm

↑ (or {Page Up}): Increases the graph data by an LSB* at the selected point

↓ (or {Page Down}): Decreases the graph data by an LSB at the selected point

{Shift} + ↑ (or {f·2}): Switches the selected graph area (line number) to another (Active row is moved down in the TABLE)

{Shift} + ↓ (or {f·3}): Switches the selected graph area (line number) to another(Active row is moved up in the TABLE) LSB*: Least Significant Bit

[Editing on the TABLE area]

Each value on the table can be directly edited by selecting the cell with mouse and putting value by key strokes. The values in the data are always changed to the nearest values that are possible to set. The values in the CPU are managed in hexadecimal data.

Key allocation when a cell in the table is selected

{Shift} + →: Switches the selected cell to the right-side rpm

{Shift} + ←: Switches the selected cell to the left-side rpm

{Shift} + ↑: Switches the selected cell to the upper-side cell

{Shift} + ↓: Switches the selected cell to the lower-side cell

{Page Up}: Increases the selected point by an LSB*

{Page Down}: Decreases the selected point by an LSB

{Enter}: Defines data

{Ctrl} + {Shift} + arrow: Switches the selected cells to the arrow direction

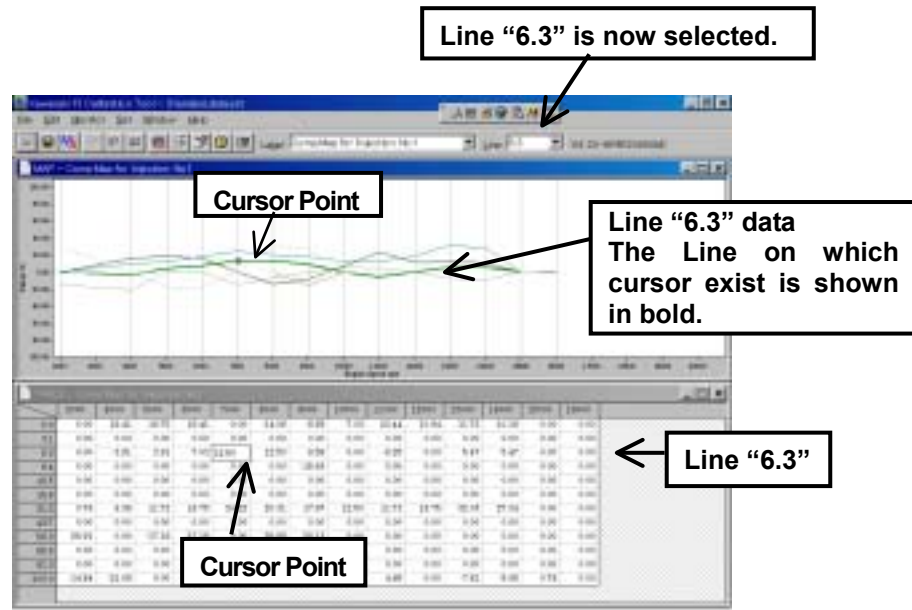LSB means Least Significant Bit.

Fig. 21 Map Edit Screen (Compensation Map for Injection No.1 is shown as a sample.)

The available setting value is restricted within the following ranges.

(In case of ZX600P)

Comp. Map for Injection rate and No.1/No.2: from -30 % to +30 %

Compensation for Acceleration: from -30 % to +30 %

Comp. Map for Spark Advance: from -30°CA to +30°CA*

Comp. Map for Sub Throttle: from -45% to +45%

Pit Road Rev Limit Point: from 0 to 12,000 rpm

Auto Shift Fuel Cut Time: from 0 to 200 ms

Auto Shift Spark Cut Time: from 0 to 200 ms

Extra Shift Lamp Point: adjust the shift indicator lighting RPM within 12,000 to 20,000 rpm.

All Area Fuel Compensation Value: from -30 % to +30 %

OverRev Shift Value: from 0 to 300 rpm

 (In case of ZX1000D6F)

Compensation for Acceleration: from -30 % to +30 %

Comp. Map for Injection rate and No.1/No.2: from -30 % to +30 %

Comp. Map for Spark Advance: from -15°CA to +5°CA*

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Comp. Map for Sub Throttle: from -50% to +50%

Comp. Map for Exhaust Valve: from -50% to +50%

Pit Road RPM Limit: from 1000 to 5000 rpm, when pit road limit SW is ON.

Auto Shifter Ignition Cut Length: from 0 to 150 ms, when auto shifter control is operated.

Extra Shift Indicate RPM: adjust the shift indicator lighting RPM within 10,000 and 15,000 rpm. This function is operated when the optional meter is equipped.

"Gear Ratio Value": set each gear ratio (only when the kit transmission is equipped.)

See appendix 5.1.2 for each gear ratio.

*CA: crankshaft rotating angle.

If a value out of the range is entered on the graph or table, the error message shown in Fig. 22 will appear and the available maximum or minimum value will be set.
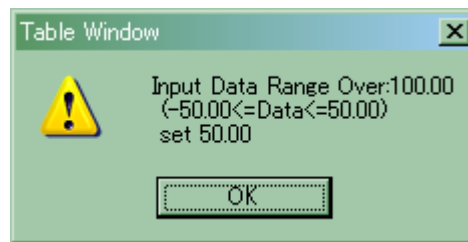

Fig. 22 Error Message

3.2.2 Map Axis Edit

In the TABLE area the axis data (Engine Revolution and Throttle Opening) can be edited by keying in the data directly after selecting the cell by mouse or keystrokes. The data is always exchanged to the nearest available setting value.
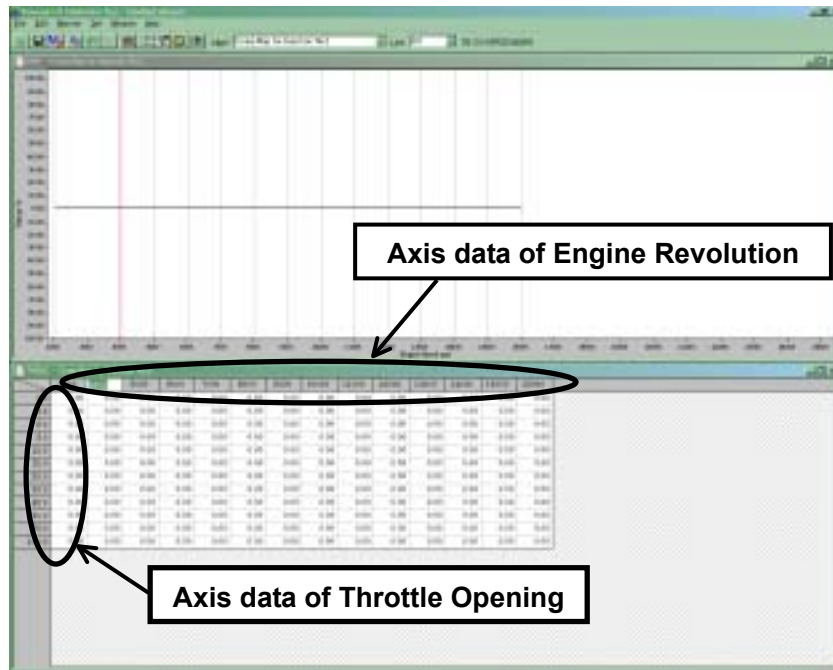

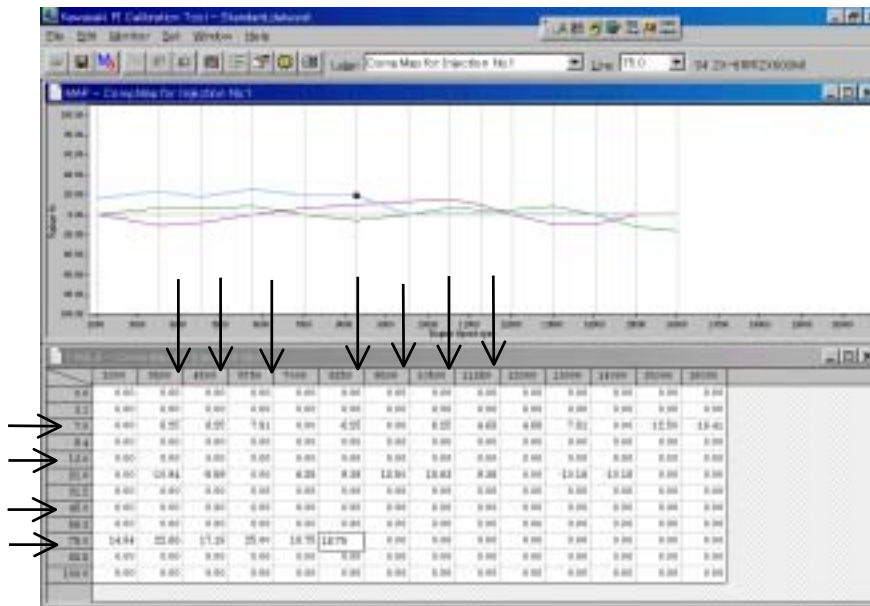
Fig. 23 Map Axis Editing (Original Axis Data)

Fig. 24 Map Axis Editing (Sample Screen After Changing the Axis Data)

NOTE

The data of engine revolution must be set in a value always larger than the left neighbor value and smaller than the right neighbor. If a value out of the available range is input, the data will be rounded within the available range.

The data of throttle opening must be set in a value always larger than the upper neighbor value and smaller than the lower neighbor. If a value out of the available range is input, the data will be rounded within the available range.

If a value out of the available range is input to both ends of the axis data, the error message will appear and the maximum or minimum available setting value will be set.

The axis data is applied to the all map simultaneously. Be caution that the changed axis data is applied to other maps.

*You cannot change the axis data at the "**Compensation for Acceleration**" screen.*

When you move from an Axis Data cell of Throttle Opening to a cell of adjusting data by key operation, the cell of the adjusting data line before editing the Axis Data will be selected.

3.2.3 Multi Map Edit

The Multi Map Edit can be used for the "**Comp. Map for Injection No.1 and No.2**" and map edit for all cylinders can be carried out at the same time.

Click the **Multi Map Edit** button in the Menu dialog
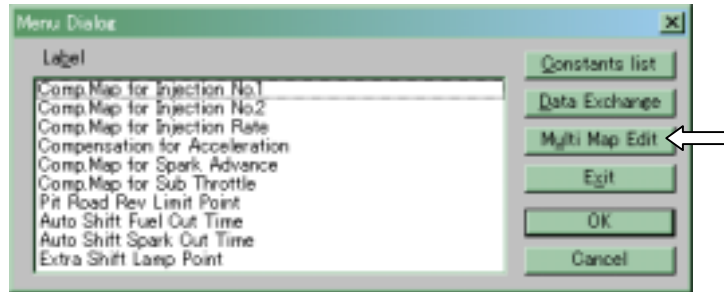
Fig. 25 Menu Dialog Screen

Then the Multi Map Edit dialog shown in Fig. 26 appears.
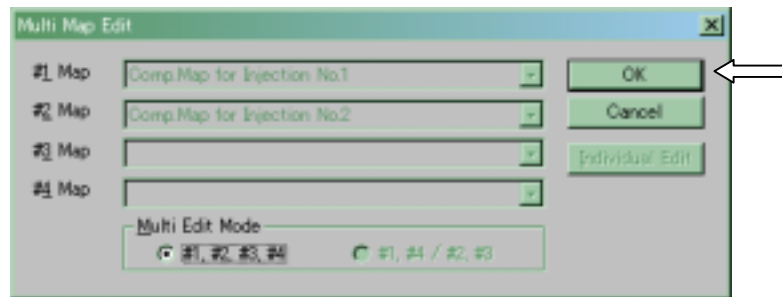
Fig. 26 Multi Map Edit dialog

Click the **OK** button to display the Multi Map Edit screen. The method of Multi Map Edit is the same as written above.

Quit the Multi Map Editing Mode

Click the **Individual Edit** button in the Multi Map Edit dialog to quit the Multi Map editing mode and display the Map Edit screen set for the #1 Map.

Or, click a Map menu other than the Multi Map in the Menu dialog to display the Map Edit screen for the selected Map.
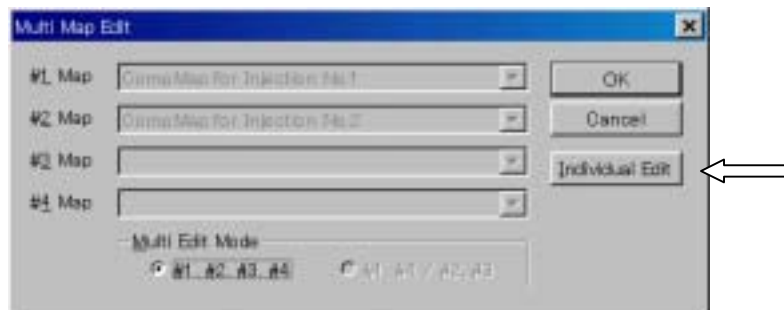
Fig. 27 Multi Map Edit dialog

CAUTION
Never edit the Multi Map setting by selecting the axis data in the Table editing area, or the axis data could be broken and the program could close.

NOTE

When selecting Multi Map editing mode, #2 Map data is overwritten with the #1 Map data.

When both the Map area and Data area are closed in the Multi Map editing, the Multi Map edit mode is automatically quitted.

3.2.4 Individual Value Edit

In this Mode you can edit the values.

Click the **Constants list** button on the Menu Dialog to display the Setting Values Edit screen.

Fig. 28 Menu Dialog Screen

Then Fig. 29 appears.

Fig. 29 Edit Constants List Screen

<Setting Items: in case of ZX600P>

The editable items in the Constants List are as follows:

All Area Fuel Compensation Value: can be set in the range from –30 % to
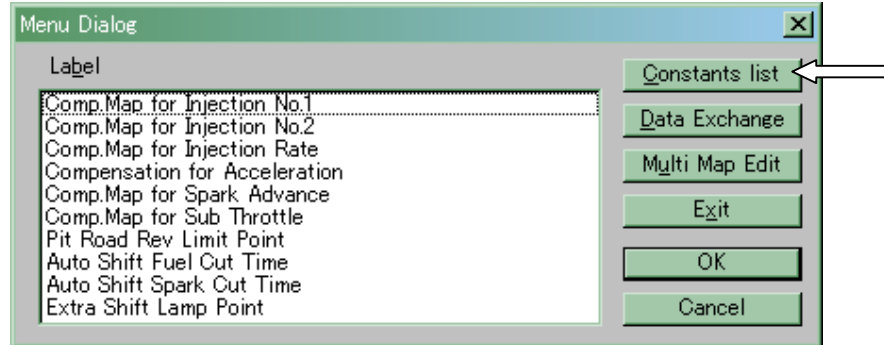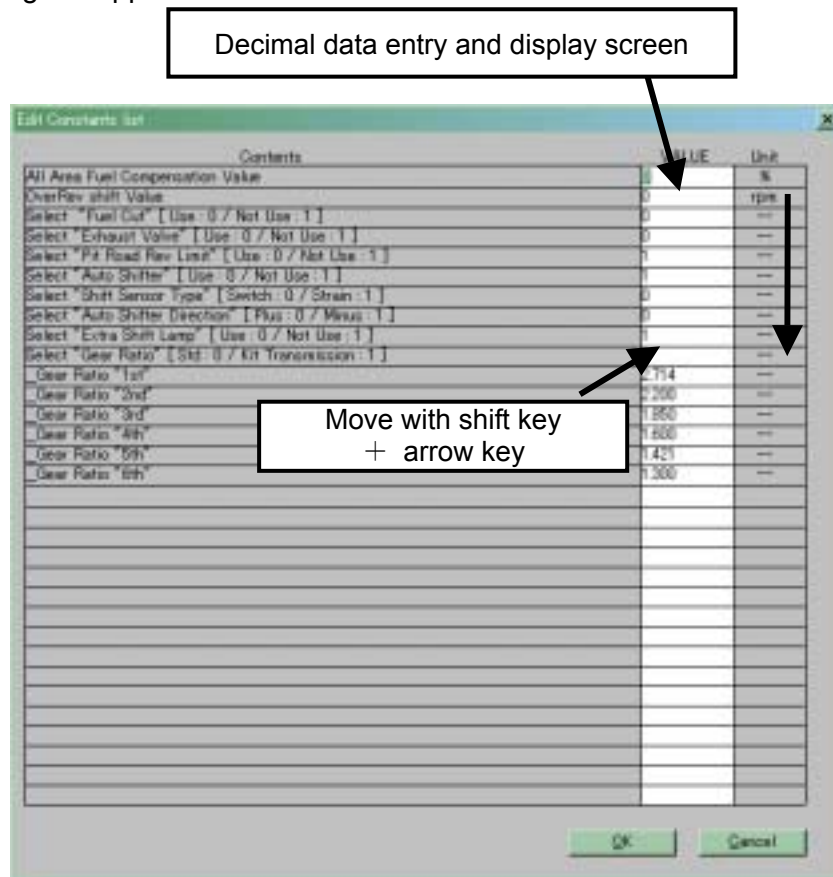+ 30 % (applied to all cylinders)

OverRev shift Value: set the off-set value from the standard Over Rev Limiter,
can be set in the range from 0 rpm to +300 rpm

Select "Fuel Cut": set the Yes or Not of Fuel Cut at decreasing the speed

Select "Exhaust Valve": set the Yes or Not of Exhaust Valve control

Select "Pit Road Rev Limit Point": set the pit road limit RPM from 0 to
12,000

Select "Auto Shifter": set the Yes or Not of Auto Shifter control

Select "Shift Sensor Type": set the Shift Sensor type

Select "Auto Shifter Direction": set the Auto Shifter Direction

Select "Extra Shift Lamp": set the Yes or Not of Extra Shift Lamp

Select "Gear Ratio": set the Yes or Not of Kit Transmission and set the Gear
Ratio

<Setting Items: in case of ZXT00D>

The editable items in the Constants List are as follows:

All Area Fuel Compensation Value: can be set in the range from –30 % to
+ 30 % (applied to all cylinders)

OverRev shift Value: set the off-set value from the standard Over Rev Limiter,
can be set in the range from –1,000 rpm to +700 rpm
(ZX1000-C1 cannot be set this value.)

Select "Fuel Cut": set the Yes or Not of Fuel Cut at decreasing the speed

Select "Exhaust Valve": set the Yes or Not of Exhaust Valve control

Select "Auto Shifter": set the Yes or Not of Auto Shifter control

Select "Pit Road R Limit": set the Yes or Not of Pit Road RPM control

Select "Extra Shift Indicator": set the Yes or Not of Extra Shift Indicator
control

Select "Kit Transmission": set the Yes or Not of Kit Transmission (Be sure to
set when you use the Kit Transmission.)

Key allocation when a cell in the table is selected

{Shift} + ↑: Switches the selected cell to the upper-side cell

{Shift} + ↓: Switches the selected cell to the lower-side cell

{Page Up}: Increases the selected point by an LSB

{Page Down}: Decreases the selected point by an LSB

{Enter}: Defines the data
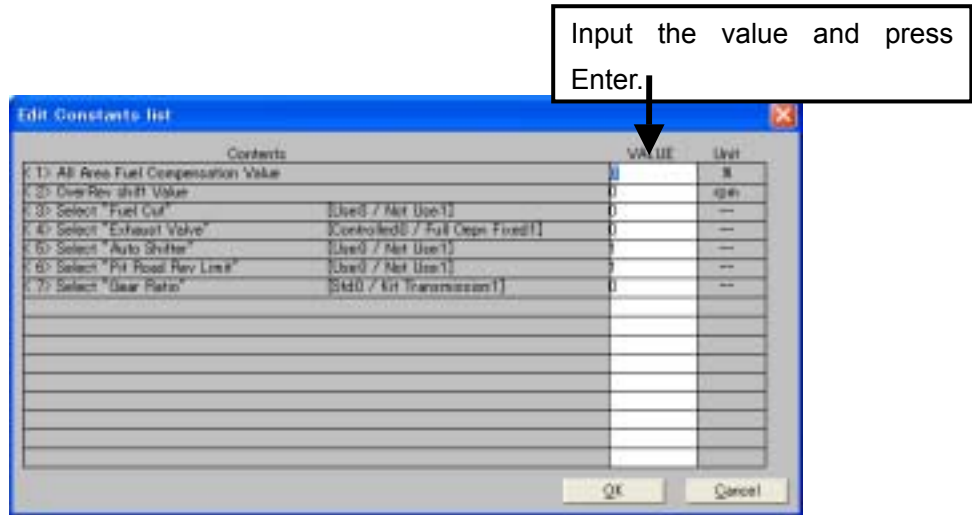
Fig. 30 Edit Constants List (Setting Data Sample)

The setting values are shown in a table and each value can be directly edited by selecting the cell with mouse and putting value with keystrokes. The values in the data are always changed to the values nearest available setting values.

If a value out of the range is put in the table, the error message shown in Fig. 31 will appear and the nearest available value will be set.
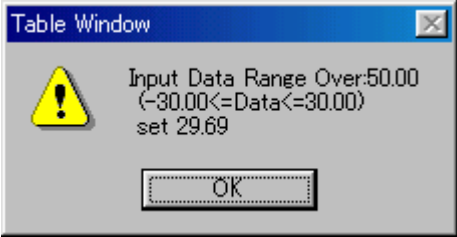

Fig. 31 Error Message

NOTE

The total Fuel Compensation Value is limited within -30% to +30% range of the original setting for fuel injection quantity. If the total value of [All Area Fuel Compensation Value] multiplies [Compensation for Acceleration] or [Comp. Map for Injection No.1(No.2)] exceeds the limit, the total Fuel Compensation Value is set to –30% or +30%.

[Example]   Comp. Map for Injection No.1 (or No. 2): 20% up

All Area Fuel Compensation Value: 30% up

1.20 x 1.30 = 1.56, 1.56 > 1.30

So, Total Compensation Value is 30 % up

Total Compensation Value is not 56 % up

When the Fuel Compensation Value is 0 %, the injected fuel quantity is controlled by the Base Map. And the Base Map is calculated by water temperature, air temperature, intake air pressure, throttle position, altitude pressure, and etc.

The intermediate values of the Map are calculated linearly.

CAUTION

When changing the Map, change the values gradually by checking the engine condition or measuring the Air/Fuel ratio.

*Always select **"Fuel Cut"=0** and **"Pit Road RPM Limit"=1(not use)** when your motorcycle is equipped with catalyzer. If you failed, the muffler could burn out and break down.*

When removing the exhaust valve actuator, set the "Select Exhaust Valve" =1(Full Open Fixed)

Always select "Kit Transmission"=1 when your motorcycle is equipped with the Kit Transmission. Input the appropriate gear ratio value (see appendix 5.1.2 (3) and 5.1.3(3) for the gear ratio value).

The Side Stand Switch function does not operate. Be caution at running when equipping the side stand.

3.3 Changing ECU Data

The racing ECU has two kinds of memory called ROM and RAM. So, there are two data exchange methods.

ROM: Read Only Memory. Non-Volatile Memory.

The content in the memory is held even if the power source is turned off.

RAM: Random Access Memory. Volatile Memory.

The content in the memory is deleted when the power source is turned off.

The CPU can read the content from the memory and write content into the memory.

(1) ROM data exchange:

All data can be exchanged collectively and it takes about one and a half minutes.

Even if the Ignition switch turns off the data will not be erased. But the data cannot be exchanged when the engine is running. (Use ROM data exchange for normal circuit riding.)

(2) RAM data exchange:

The data can be exchanged when the engine is running, but the data is erased when the Ignition switch turns off. (Use RAM data setting for temporally setting adjustment.)
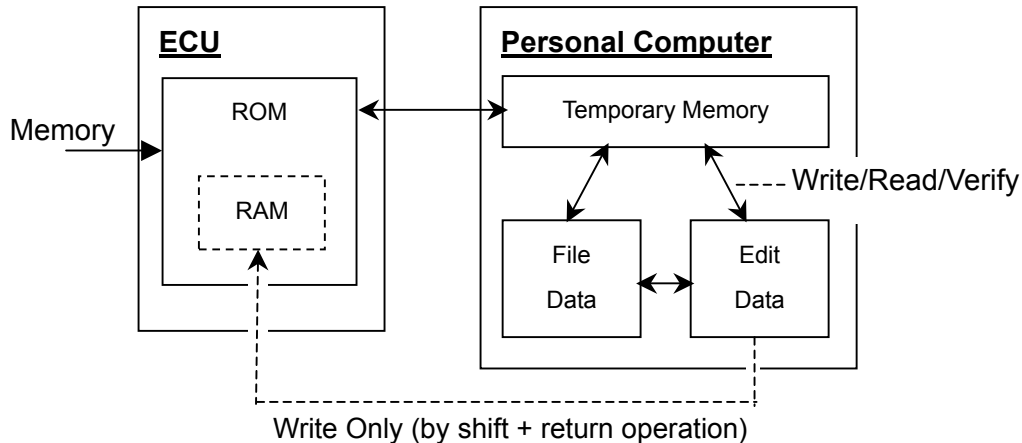
Fig. 32 The Data Flow between ECU and PC

Operation method of ROM data exchange

Click the **Data Exchange** button in the Menu dialog
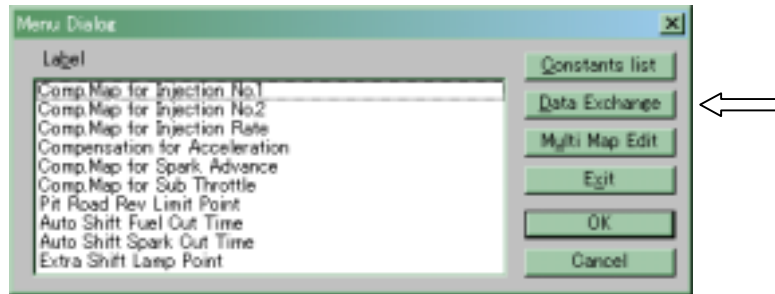
Fig. 33 Menu Dialog

Data Exchange screen is displayed as shown in Fig. 34.
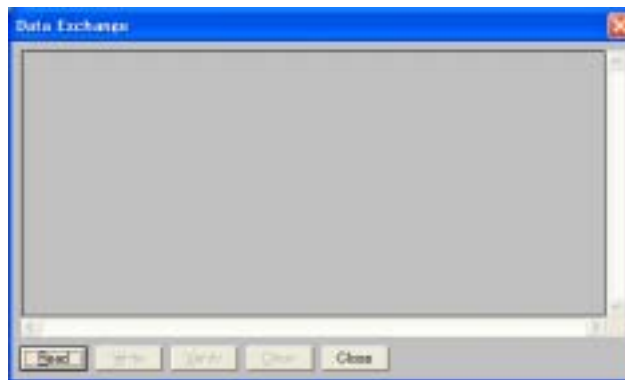
Fig.34 Data Exchange

In case of ROM data exchange, the data on the PC screen cannot be written directly to ECU. It is necessary to transfer the data temporarily to the operation memory in the PC (see Fig. 32).

The buttons "Read", "Write" and "Verify" on the screen are operated mainly in the operation memory.   The operation content is displayed on the screen by pressing each button.

Then the Data Exchange screen shown in Fig. 35 appears.
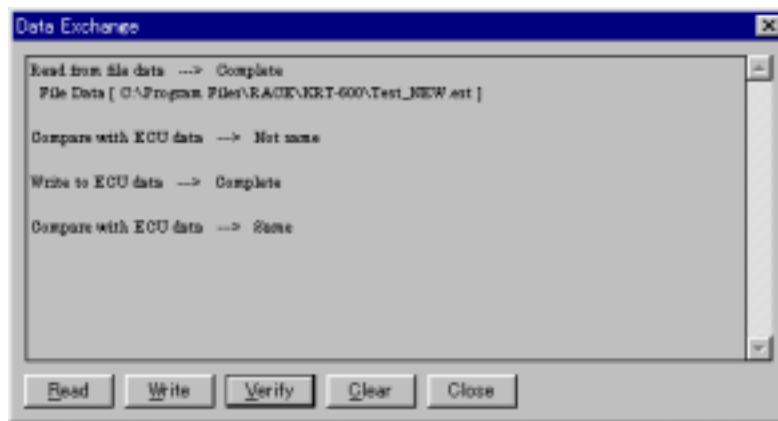
Fig. 35 Data Exchange Screen

In the Data Exchange screen, you can read, write and verify the data among the ECU data edit data and file data.

The operation contents are shown on the screen step by step.
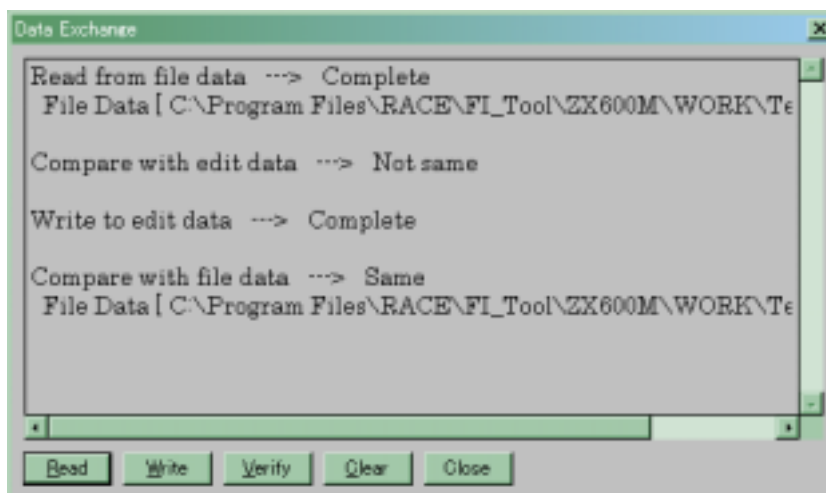
Fig. 36 Data Exchange Screen

The use and operation for each button is as follows:

[Read]

Click this button to read the data into the PC memory. (Essential operation)

You can read data from the following three data sources:

Read from

・ ECU Data: read the ECU data into the PC memory (when Monitor is in the Start condition, the display is grayed out.)

・ Edit Data: read the editing data into the PC memory

・ File Data: read the (*.EST) data into the PC memory

[Write]

Click this button to write the read data of the PC operating memory into the ECU or memory in PC. At this time it is necessary that ignition switch is ON but engine is not running.

Write Data

- ・ ECU: write the data into ECU (when Monitor is in the Start condition, the display is grayed out.)
- ・ Edit: write the data into the editing area as editing data

[Verify]

Click this button to select the data to be compared with the read data.

   Compare with:

    ECU Data: (when Monitor is in the Start condition, the display is grayed out.)

    Edit Data

    File Data (*.EST)

When the read data is same as the selected data, **Same** appears on the status indication area, and when they are different, **Not same** appears.

[Clear]

Click this button to clear the data exchange area on the PC.

[Close]

Click this button to finish the data change (clear the operating memory) and close the Data Exchange screen.

NOTE

*In case of writing the editing data into the ECU, **Read** the editing data into the operation range. Then **Write** the data in the operation range into the ECU.*

*After writing the data into the ECU, confirm the data to be written in is the same with the data in the ECU by using the **Verify** function. The data may be written into the ECU incorrectly according to the communication conditions.*

*The usable number of writing into the ECU is 65,500 times. If it exceeds the limited number, error message of **NOT Writing** will appear. At that time replace with a new one.*

*Be caution, if you select **Edit**, the present editing data can be lost.*

Write the data into ECU after confirming that the Ignition is turned on and the fuel pump and sub throttle valve are stopping.

<table>
<tr><td colspan="1" align="center">**CAUTION**</td></tr>
<tr><td>After writing the data into the ECU, wait until the fuel pump and the sub throttle valve stops. Then execute next operation or turn off the ignition switch.</td></tr>
</table>

NOTE

Verify the data with the ECU data after confirming that the Ignition is turned on and the fuel pump and sub throttle valve are stopping.

<table>
<tr><td colspan="1" align="center">**CAUTION**</td></tr>
<tr><td>After verifying the data, wait until the fuel pump and the sub throttle valve stops. Then execute next operation or turn off the ignition switch.</td></tr>
</table>

Operation method of RAM data exchange

The map and the edited content of each setting value in the RAM can be written to ECU unit when the engine is running.

[Edited data exchange when the engine is running]

After the data edit, the selected data by Shift + Enter will be sent to the ECU unit.

NOTE

○ *The data is sent to the ECU unit by 1 point (1 cell). If you select some cells, the data of the selected cells are sent to the ECU unit.*

○ *The sent data is valid when the engine is running.*
  (The data is not memorized in the ECU unit.)
   Be sure to save the edited data.

○ *The map axis data cannot be changed. Change the map axis data in ROM.*

3.4 Other Functions

3.4.1 Monitoring Function

In this mode, the data inside the ECU can be displayed during engine operation. Go to the pull down **Monitor** menu and select **Monitor** or click **Monitor icon** on the toolbar. The Monitor dialog shown in Fig. 37 appears. (This window can be resident)
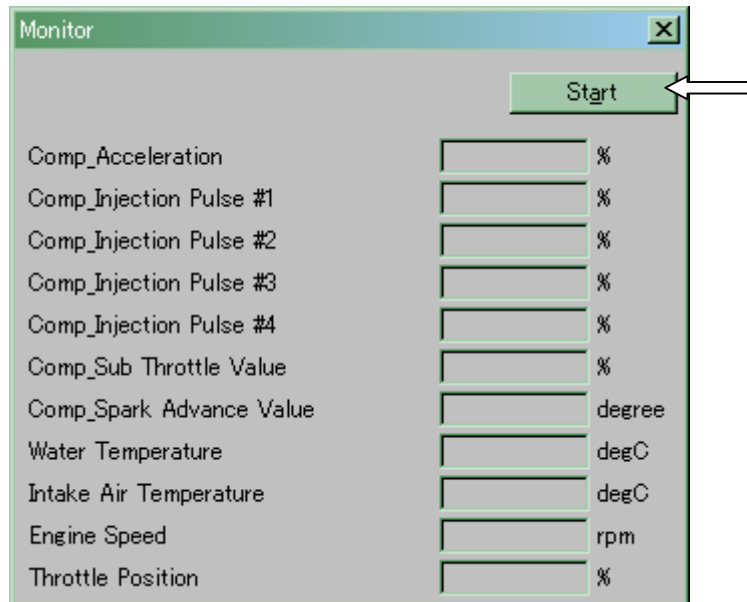
Fig. 37 Monitor Dialog

Click **Start** key to start displaying. When display starts, the key name will change to **Stop**. When the **Stop** key is pressed during exchange process, the key name will change to **Start**.

Pressing **Enter** key can change the screen from Monitor dialog screen to Main Window.

To set the data inside the ECU, which can be monitored from the Monitor dialog, go to the pull down **Monitor** menu and select **Item set**, or click **Set Item** icon on the toolbar. After the dialog shown in Fig. 38 appears, select the item that you want to set.
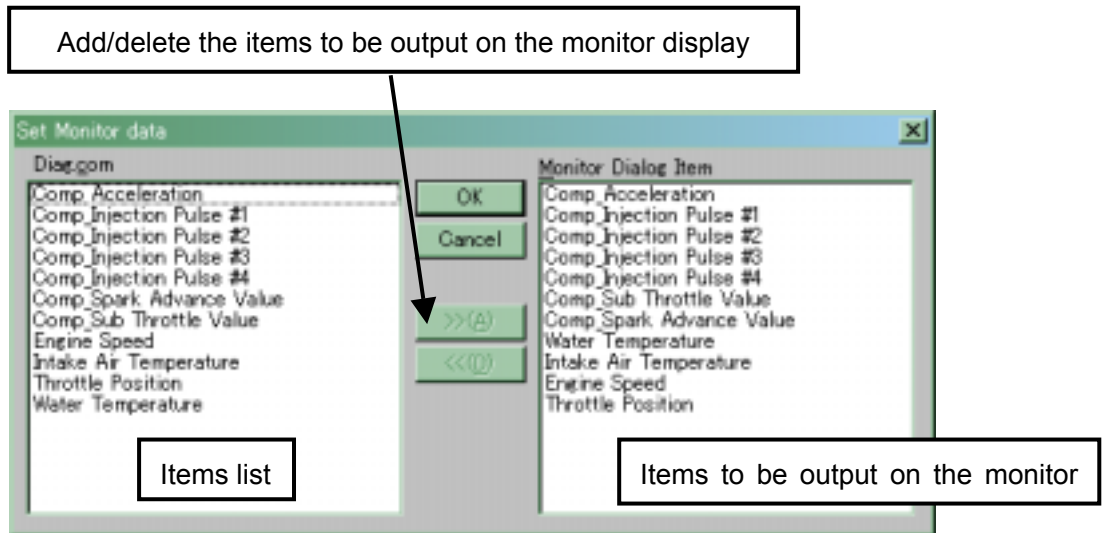
Add/delete the items to be output on the monitor display

Fig. 38 Item Setting Dialog

Setting Monitor dialog items

>>[A]: Add items selected from the list to the Monitor Dialog Item area

<<[D]: Delete items from the Monitor Dialog Item area

Details of monitoring items are as follows (in case of ZX600P):

Comp_Acceleration :

ECU calculating result in the running condition at monitoring based on the setting value of Compensation for Acceleration

Comp_Injection Pulse #1 and Comp_Injection Pulse #4:

ECU calculating result in the running condition at monitoring based on the setting value of Comp. Map for Injection No.1 (#1/#4: No.1/No.4 Cylinder)

Comp_Injection Pulse #2 and Comp_Injection Pulse #3:

ECU calculating result in the running condition at monitoring based on the setting value of Comp. Map for Injection No.2 (#2/#3: No.2/No.3 Cylinder)

Comp_Spark Advance Value:

ECU calculating result in the running condition at monitoring based on the setting value of Comp. Map for Spark Advance

Comp_Sub Throttle Value:

ECU calculating result in the running condition at monitoring based on the setting value of Comp. Map for Sub Throttle

Engine Speed: Engine Speed at monitoring

Intake Air Temperature: Intake Air Temperature at monitoring

Throttle Position: Throttle Opening at monitoring

Water Temperature: Water Temperature at monitoring

3.4.2 Title Editor (Memo)

You can record the title (memo) for each edit data.

Go to the pull-down **Set** menu to select **Title**. The Title Editor dialog appears.

You can set the mode with the mouse and directly edit the data with keystroke.
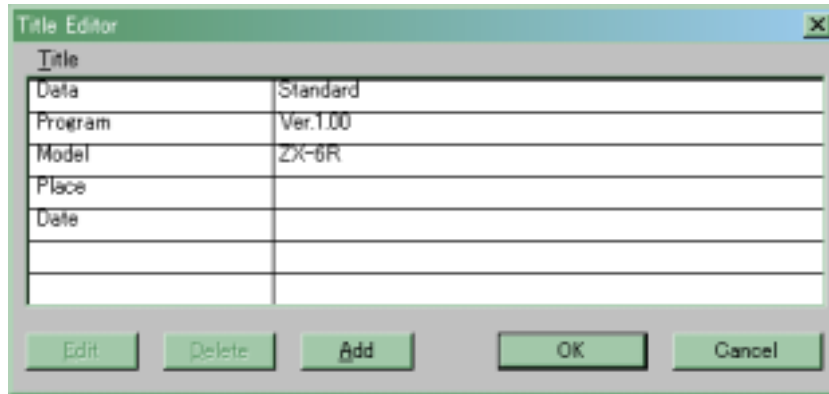
Fig. 39 Title Editor Dialog

3.4.3 Default Folder Setting Function

In this mode, you can set the default folder when **File Open** is carried out.

Go to the pull down **Set** menu to select **Folder**. The Directory dialog shown in Fig. 40 appears.

Directly enter the folder name by keystroke or use the Browsing function in the folder search dialog to select the folder from the existing folders.

Use the full path name to write in the File Path.

Fig. 40 Folder Dialog

3.5 File Saving

You can save the data.

After editing the Map, click **File** and next click **Save** button.

Put the name in the column and then click the **Save** button.

NOTE

*The file extension is **.est**. When saving the extension is attached automatically.*

If you change the extension, you cannot open the file.

When saving the data you can record the title (memo). Refer the 3.4.3 section.

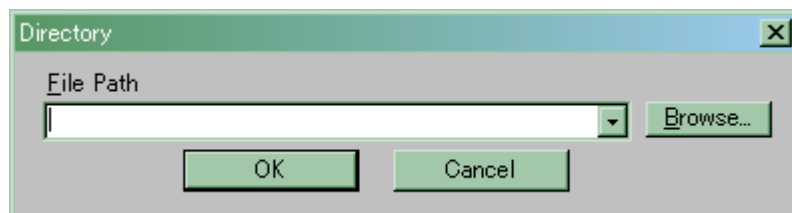## 3.6 Changing the Target Machine

You can change the editing data according to the target machine. To change the target machine, go to the pull down **Set** menu and select **Machine Select**. Then the dialog shown in Fig. 41 appears.

Fig. 41 Machine Select Dialog

After you select the machine that you want to set by mouse operation or key operation, click **OK** button or press **Enter** (Return) key. Then the machine change confirming dialog shown Fig. 42 appears.
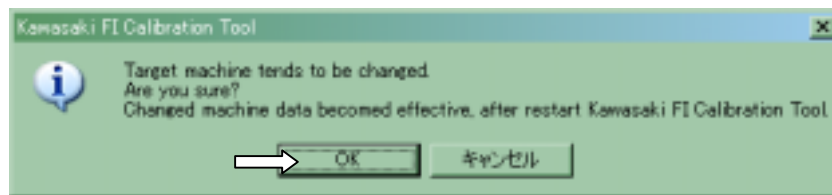
Fig. 42 Machine Change Confirming dialog

Clicking **OK** button or pressing **Enter** key can change the target machine from next starting.

NOTE

Selecting Cancel button in the Fig. 41 or Fig. 42 cannot execute the machine changing.

3.7 New Usable Functions
3.7.1 Plural Cells Data Selecting

You can select the plural cells. This is useful when copying the data to excel file or changing the data simultaneously. (See Fig. 43).

Select the start point [Click (Left button)], and select the end point [{Shift} + Click (Left button)] or [{Shift} + {Ctrl} + arrow key]
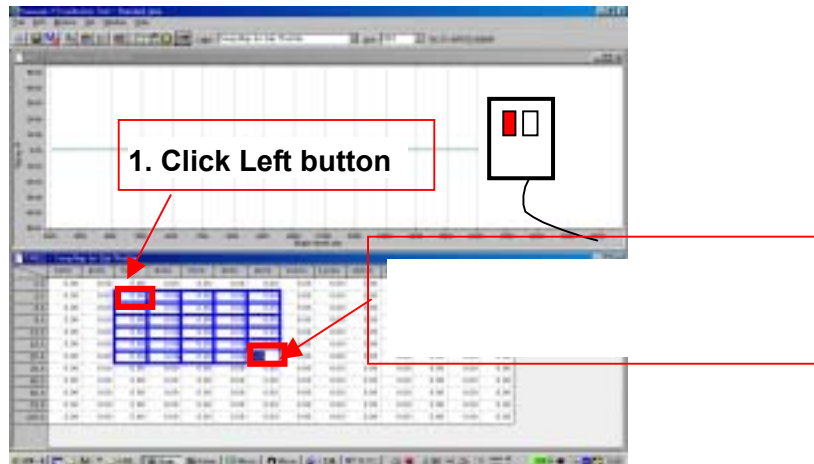
Fig. 43 Data Selecting Method

3.7.2 Plural Cells Data Copying

You can copy the selected data to Microsoft® Excel file by using Microsoft® Windows clipboard.

Copy: {Ctrl} + {C} or [Pull down menu] → [Edit] → [Copy]

Paste: {Ctrl} + {V} or [Pull down menu] → [Edit] → [Paste]
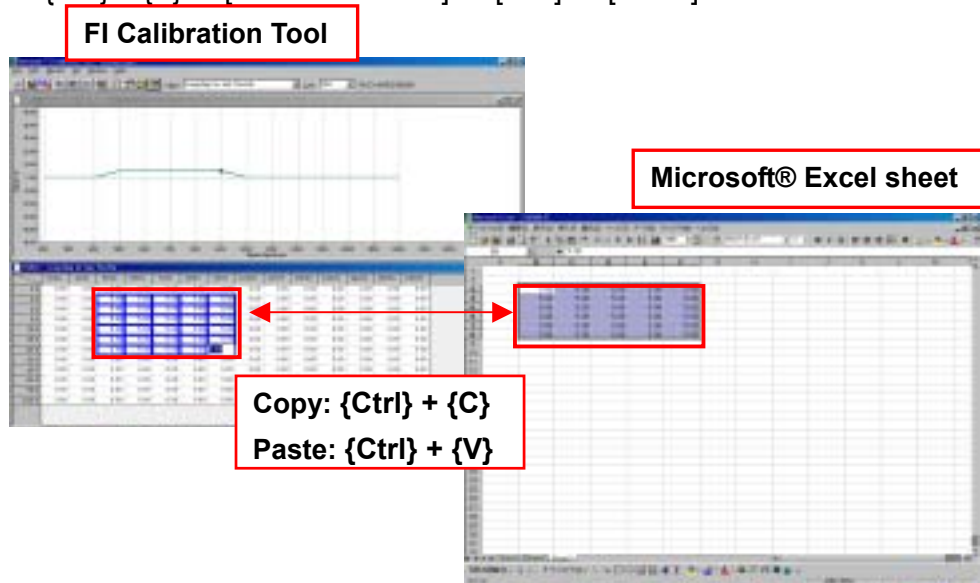
Fig. 44 Data Copying Method

3.7.3 Plural Cells Data Changing Method

You can change the value of plural cells simultaneously.

Directly input the value + {Enter} or press {Page Up} / {Page Down} key.

One {Page Up} increases 0.78 points and one {Page Down} decreases 0.78 points.
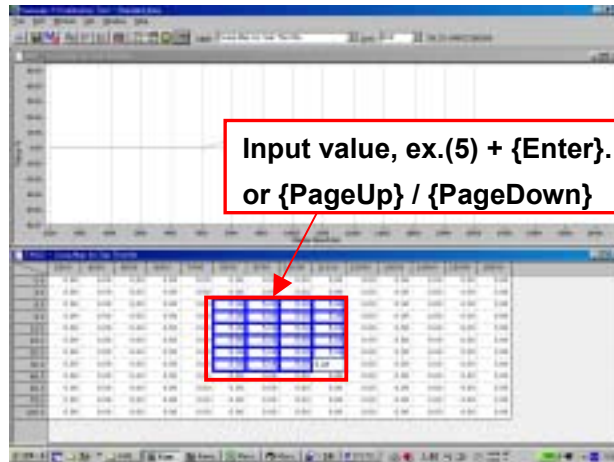
Fig. 45 Data Changing Method

4. Menu List

4.1 Pull down Menu

4.1.1 File

Open	Ctrl + O	Loads data file
Close		Closes the loaded file
Save		Names the file and saves it
Menu	F1	Displays the Menu dialog
Exit	Alt + F4	Finishes FI_Tool

4.1.2 Edit(E)

| Undo	Ctrl + Z	Cancels the data edit
Copy	Ctrl + C	Temporarily saves the data in cell(s) into clipboard
Paste	Ctrl + V	Paste the data in the clipboard
Multi Map Edit		Displays the Multi Map Edit setting dialog
Individual Edit		Finishes the Multi Map Edit

4.1.3 Monitor

Monitor…	Displays the Monitor dialog
Start	Starts the Monitor Exchange
Stop	Finishes the Monitor Exchange
Item set	Displays the Monitor Item Setting Dialog

4.1.4 Set

RS232C	Displays the RS232C setting dialog
Title	Displays the Title setting dialog
Constants list	Displays the Constants list setting dialog
Data Exchange	Displays the Data Exchange setting dialog
Directory	Displays the Directory setting dialog
Machine Select	Displays the Machine Select dialog

4.1.5 Window

Open	Opens Map or Table window
Cascade	Cascades two or more windows
Title	Titles two or more windows
All	Switches the graph mode on the Map screen between All and Single
Monitor Dialog	Moves the cursor to the Monitor dialog
MAP-*****	Displays the active windows list
TABLE-*****	Displays the active windows list

4.1.6 Help

Tool box	Displays the tool box dialog
About Kawasaki FI Calibration Tool	Displays the Version dialog.

4.2 Tool Bar (Icon)
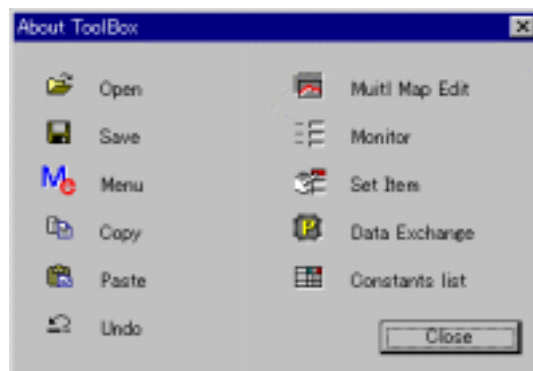
Fig. 46 Tool Box Dialog

Explanation from the left side

- Open the file (File - Open)
- Save the file (File - Save)
- Open the Menu dialog (File - Menu)
- Copy (Edit - Copy)
- Paste (Edit - Paste)
- Undo (Edit - Undo)
- Open the multi edit dialog (Edit - Multi Map Edit)
- Open the Monitor dialog (Monitor - Monitor)
- Open the Set Monitor Data dialog (Monitor - Item set)
- Open the Data Exchange dialog (Set - Data Exchange)
- Open the Constants list dialog (Set - Constants list)

5. Appendix

5.1 Connecting Method

5.1.1 '05 ZX-6RR

(1) With Optional Meter and Racing Main Harness

When installing the Racing Main Harness, refer the Race Kit Manual of ZX600-N1 (P/No. 99929-1868-01).
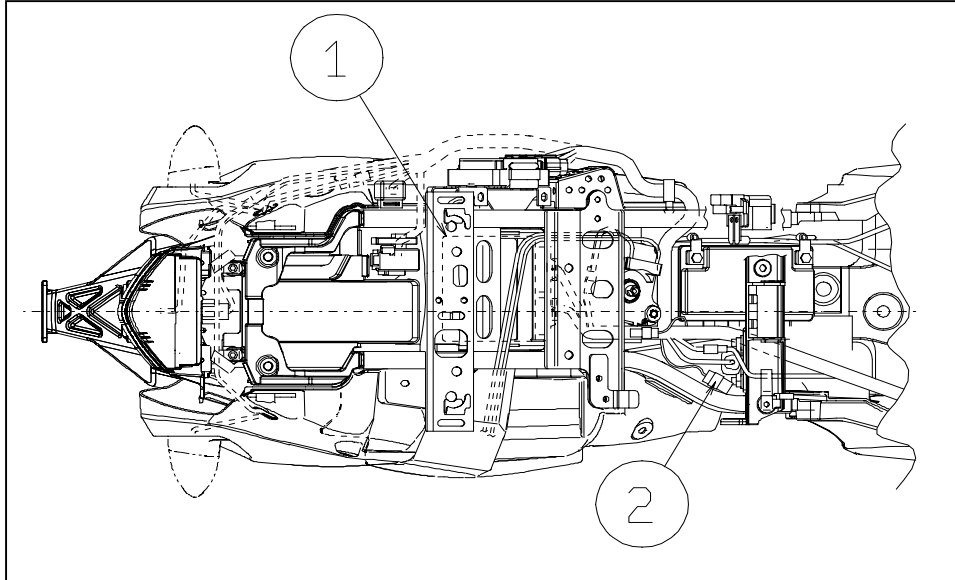
Fig. 47 Connecting Method

(1) Replace the ECU with Racing ECU.

(2) Replace the Standard Main Harness with Racing Main Harness.

(3) Connect the connector of I/F Box to the connecting port [2] of ECU [1].

(2) With Original Meter and Standard Main Harness, Sub harness

(1) Replace the ECU with Racing ECU.

(2) Connect the Sub-harness connectors to the diagnosis line of Main Harness.

(3) Insert the two leads of Sub-harness to the ECU connector as shown.

① ECU

② Racing Sub harness

③ Standard main Harness

④ I/F Box harness

⑤ Connect Sub-harness to the diagnosis line of Main Harness.

⑥ White/Green lead of Sub-harness

⑦ Red lead of Sub-harness

⑧ Insert the White/Green lead

⑨ Insert the Red lead
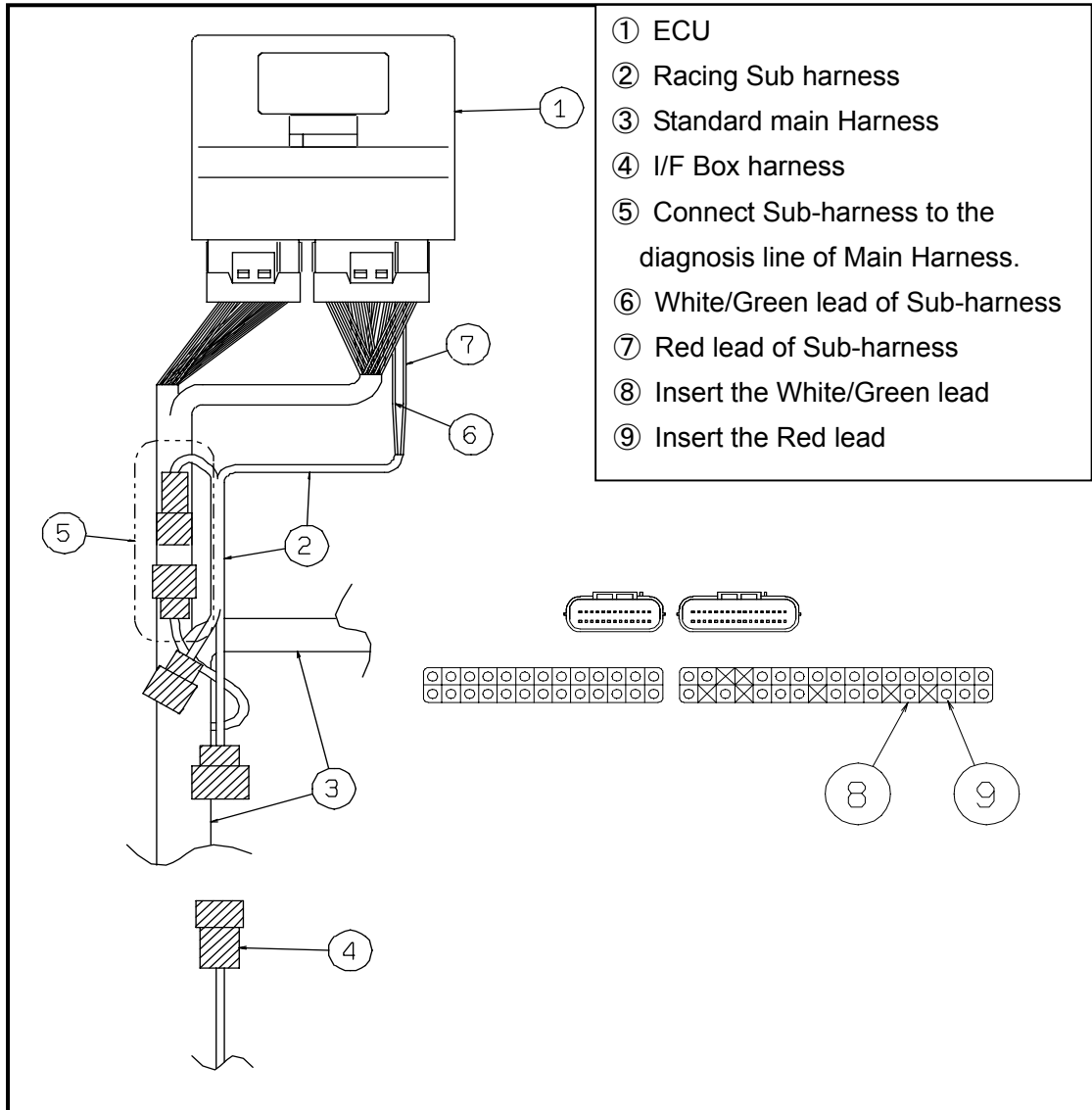
Fig. 48 Connecting Method

(4) When inserting the leads, follow the method shown below, or the edge of the lead could damage the rubber seal inside connector.
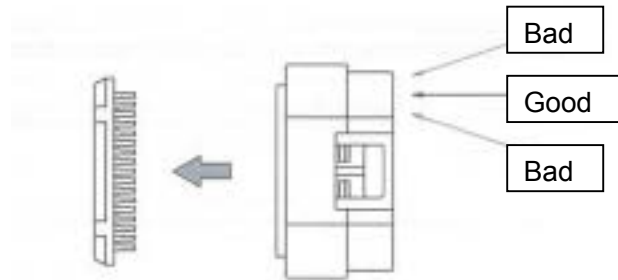
Fig. 49 Inserting Method of Leads

○ When you insert these leads, remove the orange colored cover.
  Before attaching the cover, make sure that the leads are inserted correctly.

5.1.2 '06 ZX-10R
(1) With Racing Main Harness

Connecting method

(1) Remove the Standard Main Harness and install the Racing Main Harness (P/No. 26031-0425, 0426).

(2) Replace the standard ECU with Racing ECU (P/No. 21175-0096).

(3) Connect the 6-pin connector of I/F Box to the 6-pin connector of Racing Main Harness

(2) With Original Meter and Standard Main Harness

When replacing the ECU, refer the Service Manual of ZX1000D6F.

(1) Replace the original ECU with Racing ECU.

(2) Insert the Racing Sub-harness (P/No. 926031-0427) between the Racing ECU and the Standard Main Harness.

(3) Connect the connector of I/F-Box to the connecting port of Racing Sub-harness.

Fig. 50 Connecting Method

1. ECU
2. Racing Sub-harness (P/No. 926031-0427)
3. Connect to the auto shifter (blue).
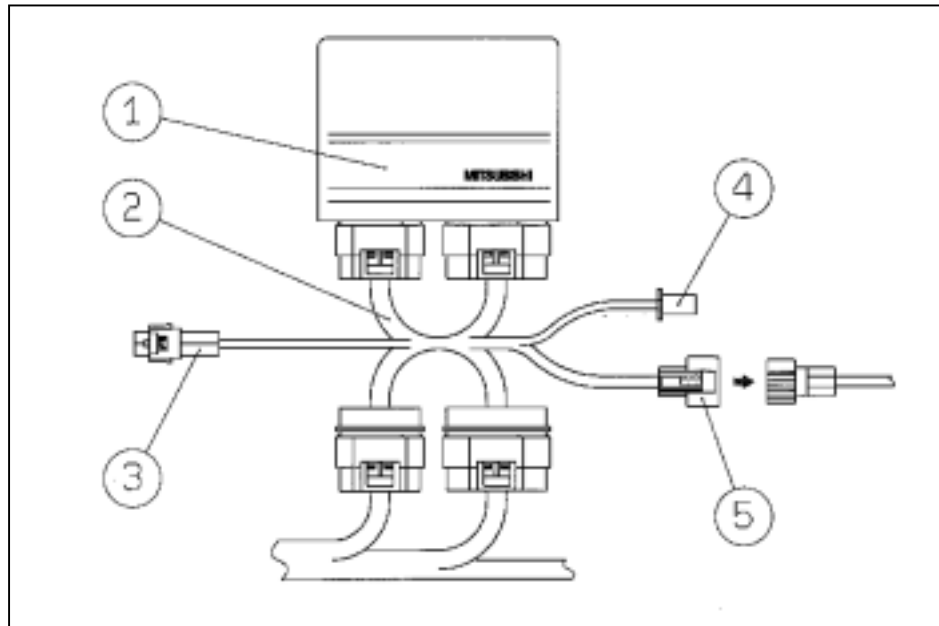4. Connect to the speed limit switch (black).
5. Connect to the I/F-Box (black).

(3) Kit Transmission

Set Select "Gear Ratio" [Std: 0 / Kit Transmission :1] to "1" of the FI_Tool and input the "Gear Ratio Value" of the map value as shown in the following chart.

If the 6th gear is changed except for A(STD), it is necessary to change the gear ratio value of all the 1st to 5th gear.

Select A for 6th gear

	A	B	C	D
1st	3.13 (15/38)	2.95 (13/31)	3.00 (14/34)	2.86 (16/37)
2nd	2.54 (19/39)	2.54 (19/39)	2.54 (19/39)	2.47 (18/36)
3rd	2.15 (19/33)	2.21 (19/34)	2.17 (16/28)	2.15 (19/33)
4th	1.89 (21/32)	1.92 (20/31)	1.89 (21/32)	1.89 (21/32)
5th	1.71 (21/29)	1.80 (20/29)	1.73 (20/28)	1.77 (21/30)
6th	1.62 (23/30)	✕	✕	✕

Select C for 6th gear

	A	B	C	D
1st	3.36 (15/38)	3.16 (13/31)	3.22 (14/34)	3.06 (16/37)
2nd	2.72 (19/39)	2.72 (19/39)	2.72 (19/39)	2.65 (18/36)
3rd	2.30 (19/33)	2.37 (19/34)	2.32 (16/28)	2.30 (19/33)
4th	2.02 (21/32)	2.06 (20/31)	2.02 (21/32)	2.02 (21/32)
5th	1.83 (21/29)	1.92 (20/29)	1.86 (20/28)	1.90 (21/30)
6th	✕	✕	1.77 (21/28)	✕

Select B for 6th gear

	A	B	C	D
1st	3.24 (15/38)	3.05 (13/31)	3.11 (14/34)	2.96 (16/37)
2nd	2.63 (19/39)	2.63 (19/39)	2.63 (19/39)	2.56 (18/36)
3rd	2.22 (19/33)	2.29 (19/34)	2.24 (16/28)	2.22 (19/33)
4th	1.95 (21/32)	1.99 (20/31)	1.95 (21/32)	1.95 (21/32)
5th	1.77 (21/29)	1.86 (20/29)	1.79 (20/28)	1.83 (21/30)
6th	✕	1.77 (21/29)	✕	✕

Select D for 6th gear

	A	B	C	D
1st	3.36 (15/38)	3.16 (13/31)	3.22 (14/34)	3.06 (16/37)
2nd	2.72 (19/39)	2.72 (19/39)	2.72 (19/39)	2.65 (18/36)
3rd	2.30 (19/33)	2.37 (19/34)	2.32 (16/28)	2.30 (19/33)
4th	2.02 (21/32)	2.06 (20/31)	2.02 (21/32)	2.02 (21/32)
5th	1.83 (21/29)	1.92 (20/29)	1.86 (20/28)	1.90 (21/30)
6th	✕	✕	✕	1.69 (22/28)

Ex. : Select 1st to 6th gear as BDACAD combination.

Select each gear ratio from the chart "Select D for 6th gear".
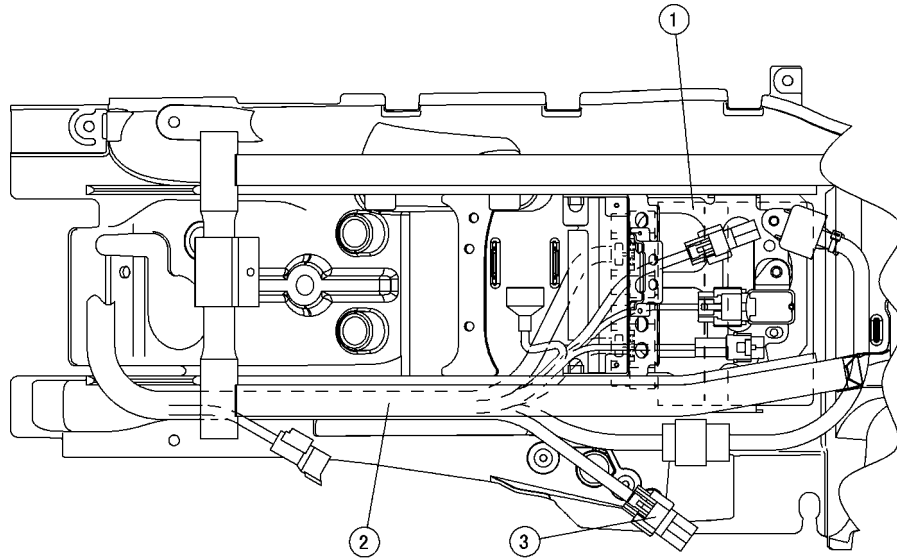
Select D for 6th gear

	A	B	C	D
1st	3.36 (15/38)	3.16 (13/31)	3.22 (14/34)	3.06 (16/37)
2nd	2.72 (19/39)	2.72 (19/39)	2.72 (19/39)	2.65 (18/36)
3rd	2.30 (19/33)	2.37 (19/34)	2.32 (16/28)	2.30 (19/33)
4th	2.02 (21/32)	2.06 (20/31)	2.02 (21/32)	2.02 (21/32)
5th	1.83 (21/29)	1.92 (20/29)	1.86 (20/28)	1.90 (21/30)
6th	✕	✕	✕	1.69 (22/28)

Therefore, the input gear ratio values are as shown below.

1st	2nd	3rd	4th	5th	6th
3.16	2.65	2.30	2.02	1.83	1.69

5.1.3 '07ZX-6R
(1) With Racing Main Harness

Fig.51 Connecting Method

1. Replace the ECU with Racing ECU.
2. Replace the Main Harness with Racing Main Harness.
3. Connect to the I/F Box

(2) With Original Meter and Standard Main Harness

Connect Sub-harness to the diagnosis line of Main Harness

①ECU

②Standard Main Harness

③Racing Sub Harness

④Connect to the I / F Box

⑤White / Green lead of Sub Harness

⑥Red lead of Sub Harness

Insert the Red lead

Insert the White/Green lead
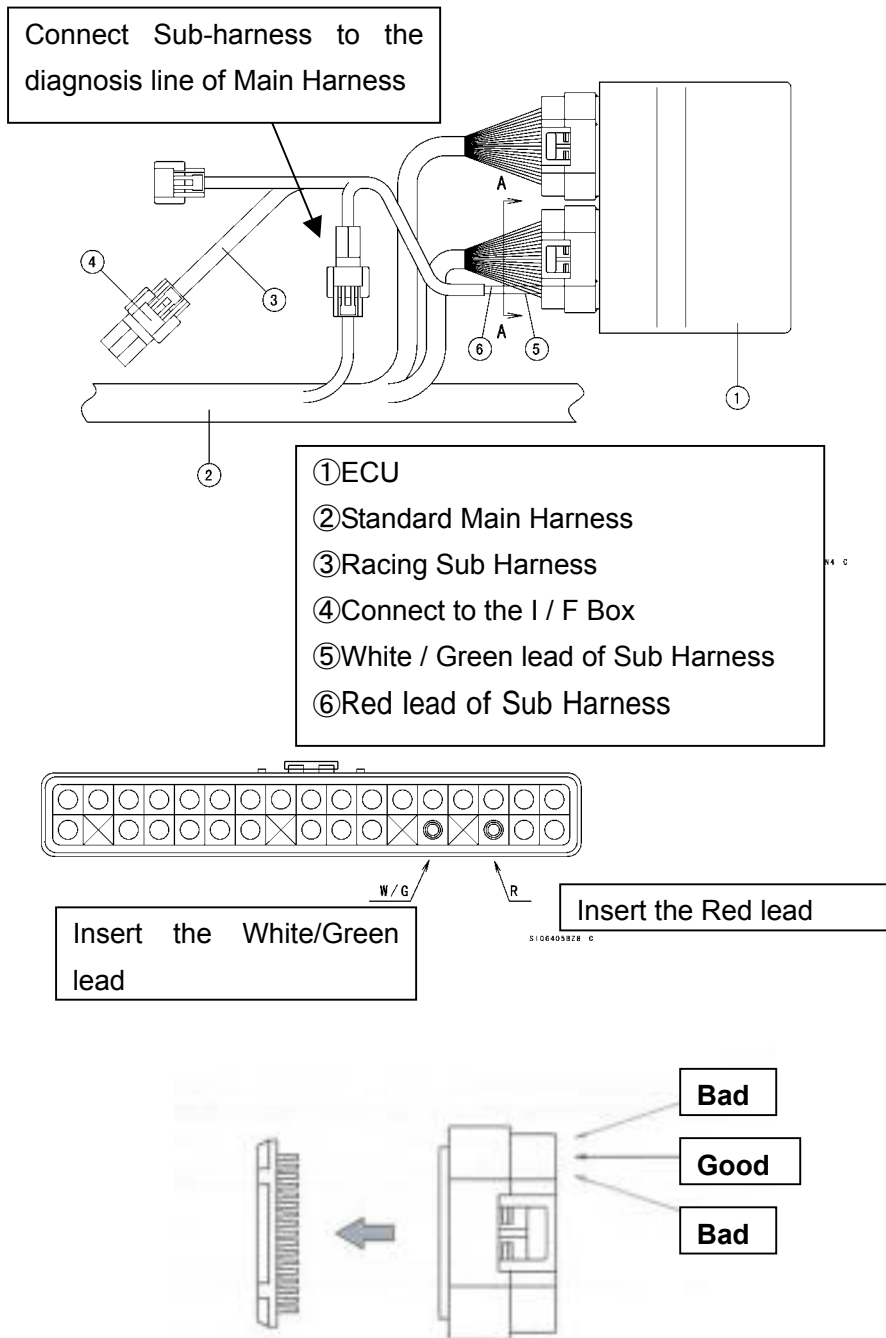
Bad

Good

Bad

Fig. 52 Connecting Method

1. Replace the ECU with Racing ECU.
2. Connect the Sub-harness connectors to the diagnosis line of Main Harness.
3. Insert the two leads of Sub-harness to the ECU connector as shown.
4. When you insert these lead lines, remove the orange colored cover.
5. Before attaching the cover, make sure that the lead lines are inserted.

(3) Kit Transmission

Set Select "Gear Ratio" [Std: 0 / Kit Transmission :1] to "1" of the FI_Tool and input the gear ratio values which are selected from the following the chart.

Ex. : Select 1st to 6th gear as AAAAAA combination.

Select each gear ratio from the chart.

	A	B	C
1st	2.714 (14/38)	2.643 (14/37)	2.571 (14/36)
2nd	2.200 (14/33)	2.167 (18/39)	2.125 (16/34)
3rd	1.850 (20/37)		
4th	1.600 (20/32)	1.650 (20/33)	
5th	1.421 (19/27)	1.500 (20/30)	1.458 (24/35)
6th	1.300 (20/26)	1.391 (23/32)	1.346 (26/35)

Therefore, the input gear ratio values are as shown below.

1st	2nd	3rd	4th	5th	6th
2.714	2.200	1.850	1.600	1.421	1.300

Input the gear ratio values to the Constants List.

(Fig. 29 Constants List Screen)

5.2 Caution Items when using the I/F Box

5.2.1 Caution when using the I/F Box

1. When connecting/detaching the I/F Box to/from the connector of the motorcycle, keep the ignition switch turned off.
2. Do not use the I/F Box except setting usage of the motorcycle ECU.
3. Never connect the I/F Box with connectors other than the specified connectors.
4. Never run the motorcycle with I/F Box and the PC connected to the ECU.
5. Install the connector for the terminal protection in the motorcycle connector, except when you connect the setting tool.
6. Never use the I/F Box near the place where a strong magnetic field, such as near the televisions and the radios, is generated and static electricity is generated.
7. Do not touch the terminal of the I/F Box connector directly, and do not keep the I/F Box in the place where static electricity is generated.

5.2.2 System Requirements of I/F Box

(1) Rated Voltage: 12 V
(2) Operation Voltage: 8 ~16 V
(3) Ambient Temperature: 5 ~ 35°C

5.2.3 Caution when communicating between Setting Tool and ECU

Confirm the serial communication port of PC before using the setting tool.
It is necessary to match the communication port of the setting tool with the PC side.

(1) Confirmation method of the communication port:
Open the Property of the System and check the serial port in the device manager. Correct serial port is COM1.
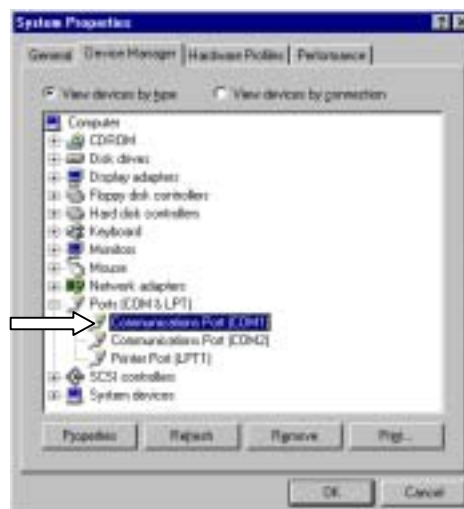

Fig. 53 Device Manager of System Property

When "?" mark or "x" mark is displayed on the COM1, the communication between ECU and PC cannot be done.

Cancel the "?" mark or "x" mark by referring the PC Instruction Manual or Help function of the Windows.

(2) Setting Method of the Setting Tool

Select the **RS232C** in the toolbar **Set** of the Setting Tool.

When the Dialog is opened, select the Port on the PC side and click the **OK** button. (If the communication port is **COM1**, select the **Port1**.)

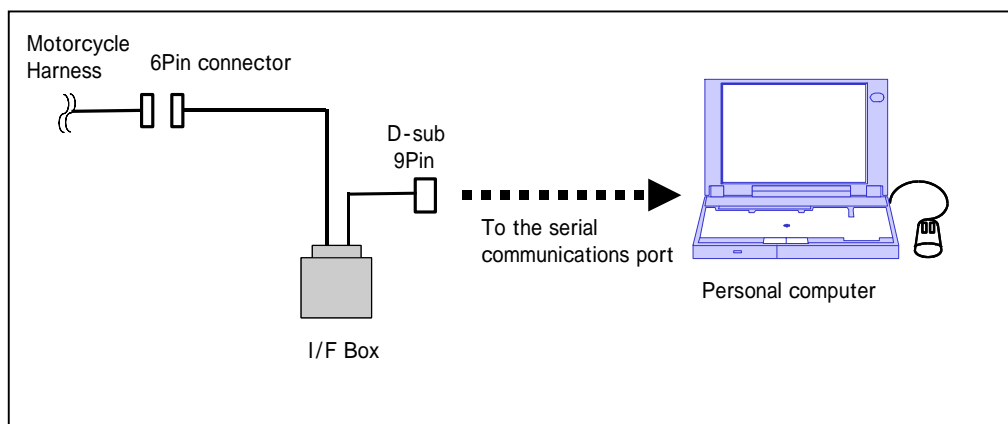(3) Connecting Method of I/F Box

Motorcycle Harness   6Pin connector

D-sub 9Pin

To the serial communications port

Personal computer

I/F Box

Fig. 54 Connecting Method of I/F Box

5.3 Troubleshooting

Refer the below table when you have troubles.

Table 4 Troubleshooting

NO.	Trouble	Cause	Countermeasure
1	Program cannot be installed.	Operating method not understood	Read manual carefully and understand it.
2	Program does not work.	PC does not match with required specifications.	Select suitable PC. Available OS is Windows XP (JP/US version)
3	PC cannot communicate with ECU.	Incorrect connection of communication cable.	Confirm connection. (Refer to connecting method.)
		Incorrect setting of serial port.	Confirm setting of serial port. COM1 is correct. (Refer to 5.2.3)
		ECU is not powered ON.	Confirm ignition switch is turned ON.
4	Cannot write data to ECU or read data from ECU. (DataExchange function does not work.)	The Engine is running.	Perform DataExchange when engine is not running but ignition switch is ON.

Kawasaki

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Consumer Products & Machinery Group

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