Kawasaki

Kawasaki Diagnostic Software Version 3
KDS v.3
Instruction Manual

Foreword

This Instruction Manual explains the operating principles of KDS to diagnose Kawasaki's Smart (KI-PASS), Digital Fuel Injection (DFI) and ABS systems. This manual is a brief introduction to KDS 3 and assumes that the technician is familiar with PC usage.

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 Third Edition (3) 24 August, 2007

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Section 1: Kawasaki Diagnostic System Version 3 Outline

1.1 System Function

KDS Version 3 was developed for Smart equipped Motorcycles with DFI, non-Smart equipped motorcycles with DFI, and DFI equipped PWC and ATV. The following functions are available.

Smart System equipped Models

1. Register the Steering Lock unit, FI ECU
2. Register the Fobs, Immobilizer key
3. Register or delete the TPMS sensor ID
4. Diagnose the Smart System
5. Monitor the Smart System

NOTE

~ *Smart System components must be registered to the Smart ECU in order to function correctly.*

DFI equipped Vehicles

1. Display ECU and model information
2. Perform diagnostics
3. Display, save, and print service data
4. Actuate individual injectors and other actuators
5. Display, save, and print real-time sensor values
6. Display and print graphs of real-time sensor values
7. Erase stored service data

ABS equipped Vehicles

1. Diagnose the ABS system
2. Erase stored service data

Other Features

1. Software can be used in ten languages.
2. Software operates on Windows 2000/XP/Vista.
3. Three units (SI, Metric, English) can be selected to display sensor values.

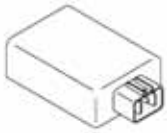
NOTE

~ *Some functions are not available on all models.*

1.2 KDS Version 3 System Configuration

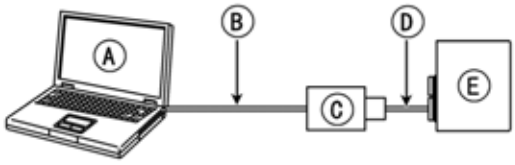
KDS Version 3 operates on a PC and communicates with the unit via a USB communications port, communication cable, and a signal converter.

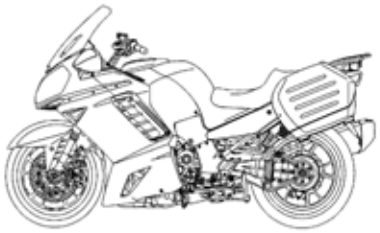
KDS consist of, (1) CD, (2) Signal Converter, (3) Communication Cables.
(Fig.1 shows the KDS 3 Kit parts for ZG1400A/B)..



(1) CD	(2) Adapter	(3) Communication cables
(KDS 3 software)	(Signal converter)	**P/No. 57001-1649 (6-pin/8-pin)**
P/NO. 57001-1650	**P/No. 57001-1648**	**P/No. 57001-1688 (8-pin/4-pin)**

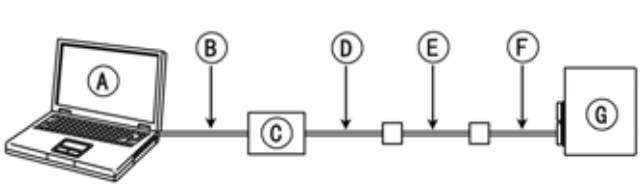
Fig. 1-1 KDS 3 Tools

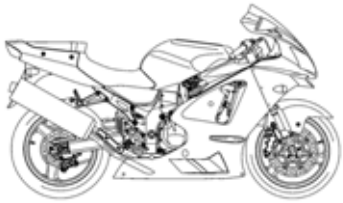




A: Personal Computer (PC)
B: USB cable
C: Converter (**57001-1648**)
D: 6-pin connector of main harness
E: Smart ECU

Fig. 1-2 Sample connection of ZG1400 system

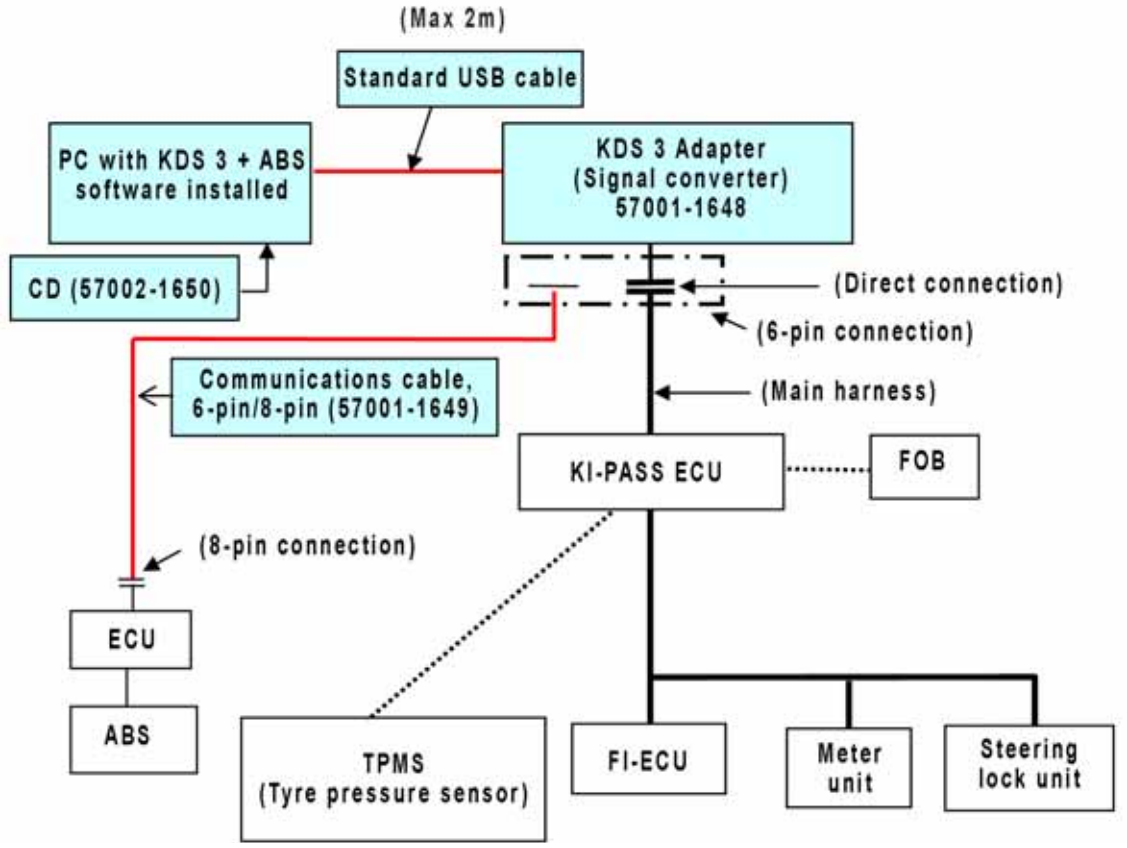




A: Personal Computer (PC)
B: USB cable
C: Converter (**57001-1648**)
D: 6-pin/8-pin cable (**57001-1649**)
E: 8-pin/4-pin cable (**57001-1688**)
F: 4-pin connector of main harness
G: FI ECU

Fig. 1-3 Sample connection of other DFI vehicles

1.3 ZG1400A/B System Configuration



1.4 Personal Computer (PC) Minimum System Requirements for KDS 3

Table 1-a PC Requirement

Hardware	Requirements
CPU	Pentium, 133 MHz or faster
OS (Operating System)	Windows 2000/XP/Vista
Hard Disk	20 MB or more of free space (40 MB or more is recommended.)
Display	SVGA
Disk device	CD-ROM or DVD drive
Printer	Black and White or Color
Interface port	USB port
USB Cable	Should be used between PC and Converter. BUFFALO, USBC2-SBK, (length: 2.0 m) If this cable is not available, use a similarly specified double shielded cable with a maximum length of 2 m.

NOTE

- ~ *Do not use a screen saver.*
- ~ *Do not use power management mode.*
- ~ *When changing an ECU, exit KDS and then restart.*
- ~ *You must use the PC as an administrator.*
- ~ *USB cable should be purchased locally.*

Section 2: Installation Procedures

NOTE: All screenshots in this Manual are from a PC operating on Windows XP.

You must install two software programs on your PC. One is for the KDS 3 Adapter (converter) and the other is for the KDS software.

2.1 Installation of KDS 3 Adapter

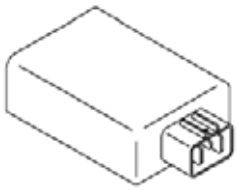
- Start your PC, and then insert the CD (P/N 57001-1650).
- Open the CD, and save the **KDSAdapter.inf** and **KDSAdapter.sys** files to a location on your PC.
- Connect the KDS 3 Adapter (PN 57001-1648) to your PC with the USB cable.

NOTE

~ *Purchase a USB cable locally with a maximum length no longer than 2m.*

Fig. 2-1 Files in CD

- Connect the KDS Adapter to the connector (6-pin type) on the main harness.
- Turn ON the ignition.



KDS Adapter (Signal Converter)

The PC detects the KDS Adapter and starts the **Found New Hardware Wizard**.

- Select **No, not this time**; a new screen will appear.
- Select **Install from a specific location (Advanced)** on the next screen.

Then select **Next>**

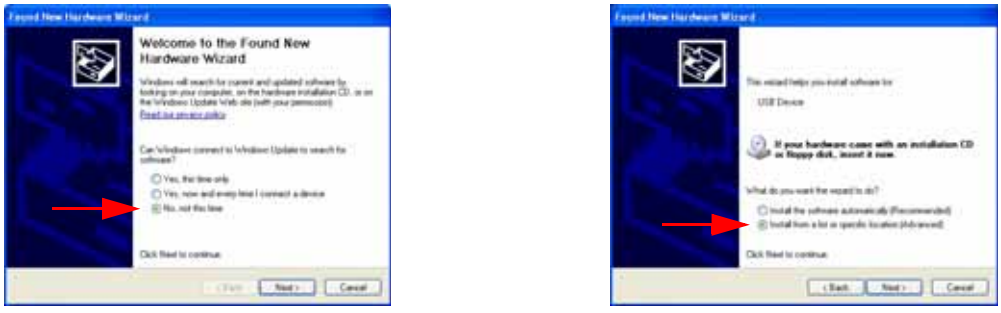


Fig. 2-2 Starting the Wizard

Selection of Search Option

- Select **Don't search**
  Then select **Next>**

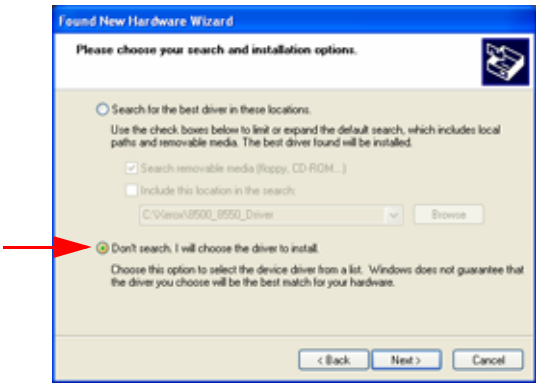


Fig. 2-3 Search Selection

Selection of Device Driver.

- Select **Show compatible hardware**
- Select **KDS Adapter**
- Then select **Next>**

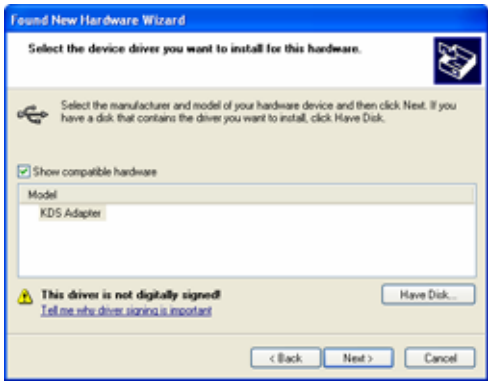


Fig. 2-4 Selection of Device Driver

- Select the location of **KDSAdapter.inf** file.
- Then select **Open**.

Fig. 2-5 Locate Driver

Fig. 2-6 Selection of Driver

Installation in progress screen.

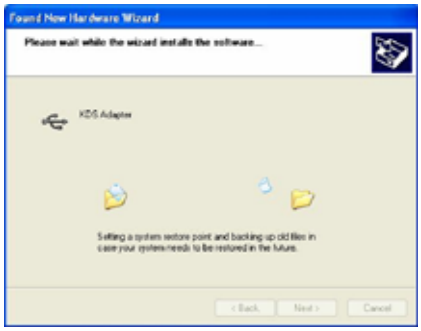


Fig. 2-7 Installation

- Finished: select **Finish**.

Fig. 2-8 Installation Complete

2.2 Initial Installation of KDS 3 Software

- Start Windows.
- Insert the KDS CD into the CD drive.
- CD autolaunches (or navigate to the drive location then double click **InstKDS.exe**).

Fig. 2-9 KDS 3 File Folder

o Select the language.
Then select **OK**.

Language abbreviation are as follows.
DE: German, EL: Greek, EN: English,
ES: Spanish, FR: French, IT: Italian,
NL: Netherlands, PT: Portuguese,
SV: Swedish

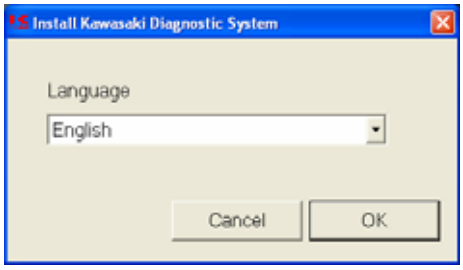


Fig. 2-10 Language Selection

Installation program starts automatically.
o Select **Next>**

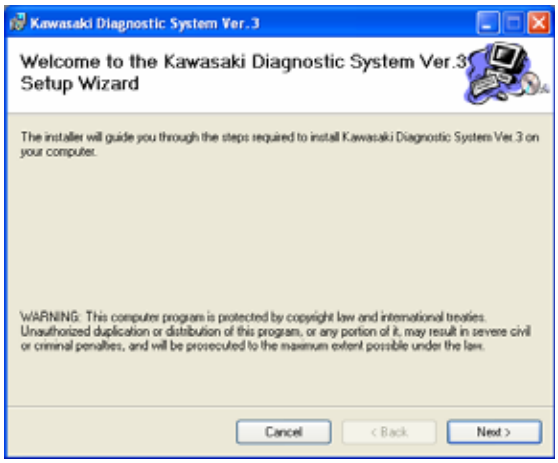


Fig. 2-11 Installation Wizard

o Select Installation Folder.
The default folder is:
C:\Program Files\Kawasaki Diagnostic System Ver.3

o Select **Just me**
o Then select **Next>**

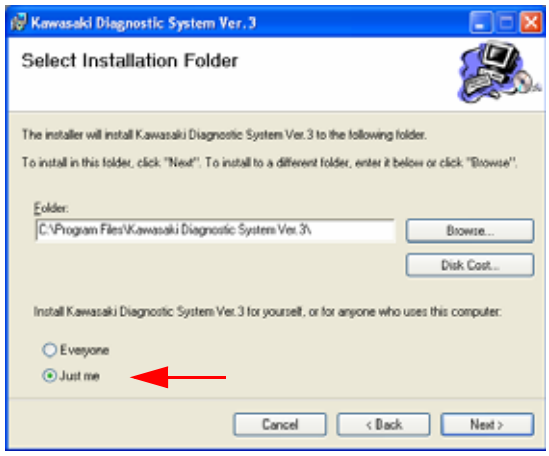


Fig. 2-12 Selection of Installation Folder

o Follow the on screen instructions.

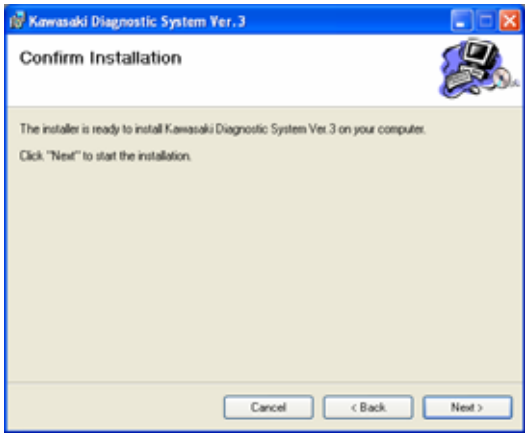


Fig. 2-13 Install Shield Wizard

Installation in progress screen

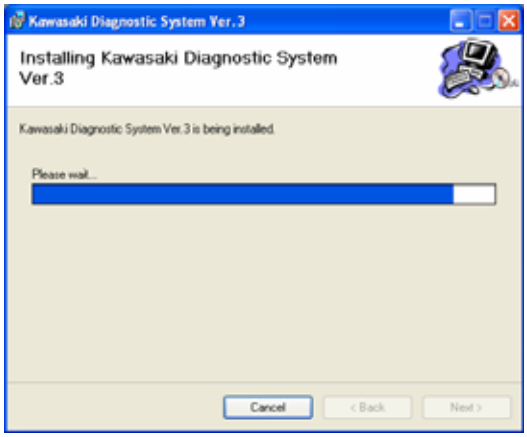


Fig. 2-14 Beginning Installation

Installation completes.

o Select **Close**

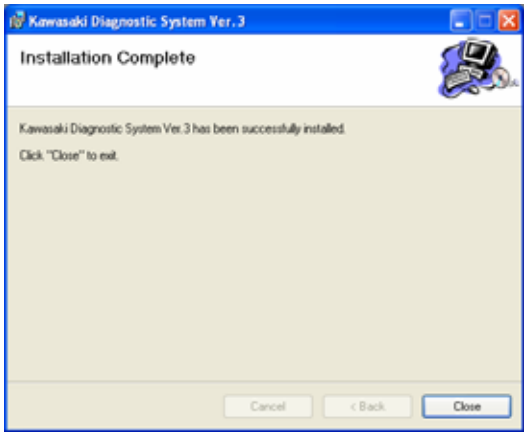


Fig. 2-15 Installation Complete

Section 3: Cable Connection

3.1 Required Tools

A. KDS 3 Adapter	57001-1648
B. Com. Cable (6-pin/8-pin)	57001-1649
C. KDS 3 Software	57001-1650
D. Com. Cable (8-pin/4-pin)	57001-1688
E. USB Cable	

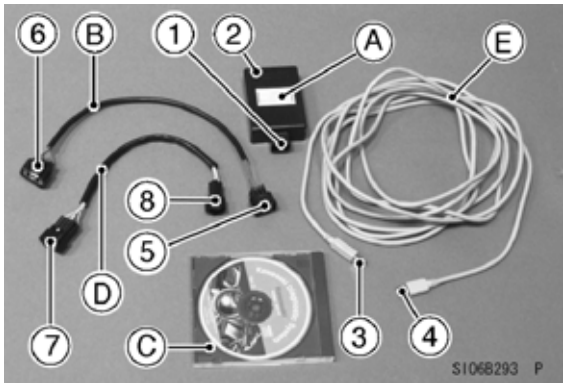


Fig. 3-1 Required Tools

Detail of Connection

1. Connect to main harness of vehicle
2. USB port of KDS 3 Adapter
3. Connect to KDS 3 Adapter
4. Connect to PC
5. 6-pin port, Connect to KDS 3 Adapter
6. 8-pin port, Connect to ABS ECU port of main harness
7. 8-pin port, Connect to No.6 port
8. 4-pin port, Connect to KDS port of main harness

3.2 Connecting PC to ECU

Refer to the following diagrams or the Service Manual for the location of the diagnostic ports.

3.2.1 ZG1400A/B

(1) Smart and DFI systems

- Remove seat.
- Locate the 6-pin connector [A] on the main harness and remove the cover.
- Connect the 6-pin connector to the Adapter [B].
- Connect the USB cable [C] to the Adapter.

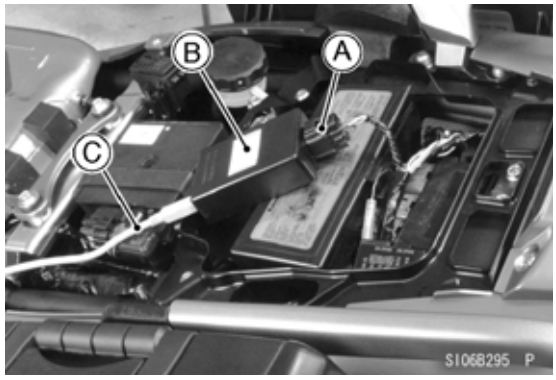


Fig. 3-2.1 Tool Connection

(2) ABS system

- o Remove seat.
- o Locate the 8-pin connector [A] on the main harness and remove the cover (ABS port).
- o Connect cable 57001-1649 [B] to the 8-pin ABS port.
- o Connect the 6-pin connector on 57001-1649 to the Adapter [C].
- o Connect the computer's USB cable [D] to the Adapter.

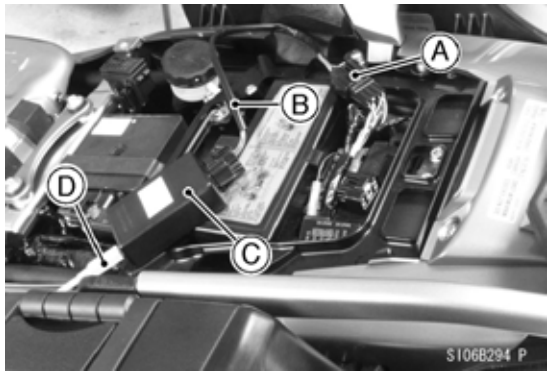


Fig. 3-2.1.1 Tool Connection (ABS)

3.2.2 ZX1200-A/B

- o Remove the (rear) compartment cover.
- o Remove the cover on the harness.
- o Connect the adapter cable to the diagnostic port on harness

A. Diagnostic port (4-pin) on harness

B. Communication Cable

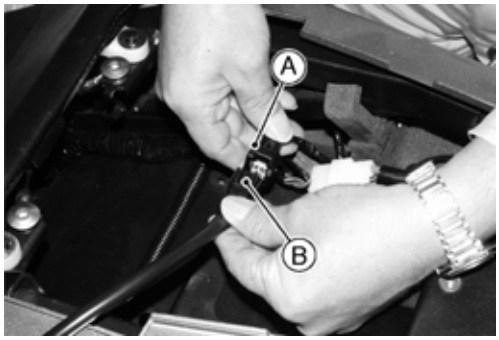


Fig. 3-2.2 Connection of ZX1200-A/B

3.2.3 VN1500-P

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port (4-pin)

B. Battery

C. ECU

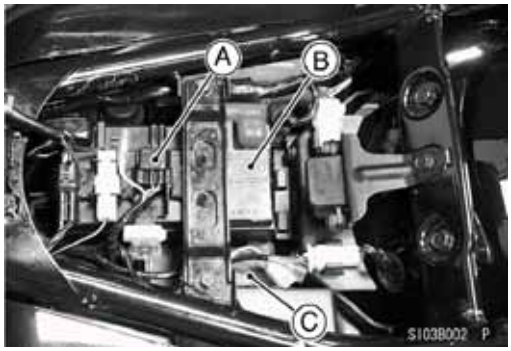


Fig. 3-2.3 Connection of VN1500-P

3.2.4 VN1600, VN2000

- o Remove the seat. --VN1600-A/B
- o Remove the seat and battery cover –VN2000-A
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port (4-pin)

B. Battery

C. ECU

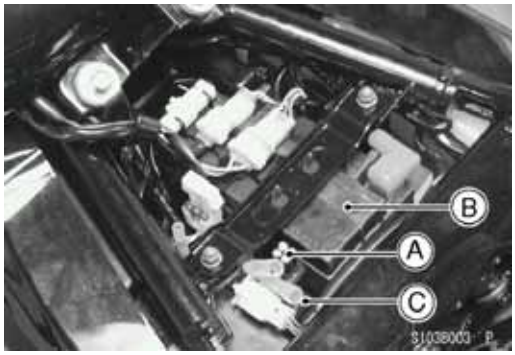


Fig. 3-2.4 Connection of VN1600-A

3.2.5 ZX636, ZX600, ZR1000, ZR750, ZX1000-C

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port (4-pin)
B. Battery
C. ECU

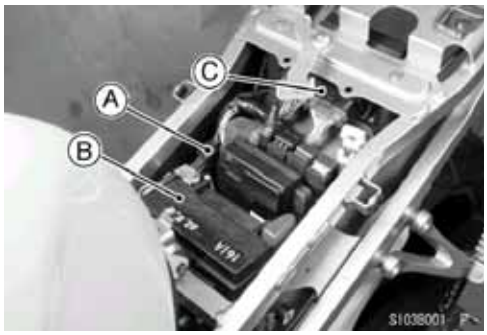


Fig. 3-2.5 Connection of ZX636-B

3.2.6 JT1200B/D, JT1500A

- o Remove the seat and rear storage pocket.
- o Disconnect the 8-pin connector [C] and insert the relay cable (57001-1535) between the connector.
- o Connect the lead of relay cable to the (-) terminal of battery.
- o Remove the cover of diagnostic port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port (4-pin)
B. Relay Assembly
C. 8-pin Connector
D. Battery

~ *The relay cable must be connected to prevent loss of communication due to the ECU timing out if the engine is not started.*

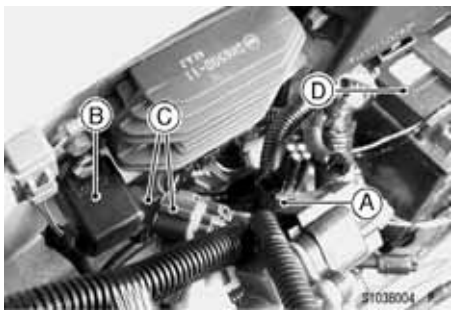


Fig. 3-2.6 Connection of JT1200-B

3.2.7 VN900B/D

- o Remove the seat.
- o Remove the right side cover [A].
- o Access to the Diagnostic Port [B] from right side.
- o Remove the cover and connect the adapter cable to the diagnostic port on harness.

A. Right Side Cover
B. Diagnostic Port (4-pin)

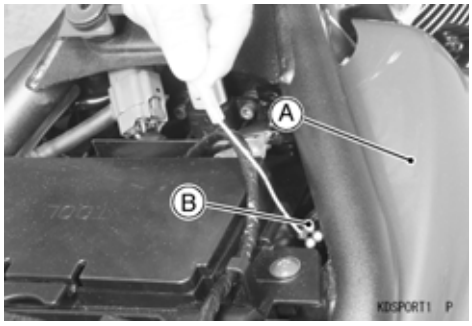


Fig. 3-2.7 Connection of VN900-B/D

3.2.8 ER650, EX650

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port for KDS (4-pin port)

B. Diagnostic Port for ABS (8-pin port) ABS model only

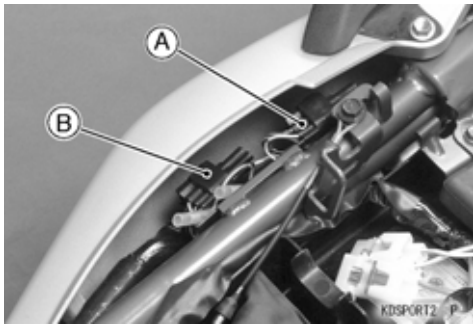


Fig. 3-2.8 Connection of ER650

3.2.9 ZX1400

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port for KDS (4-pin port)

B. Diagnostic Port for ABS (8-pin port) ABS model only

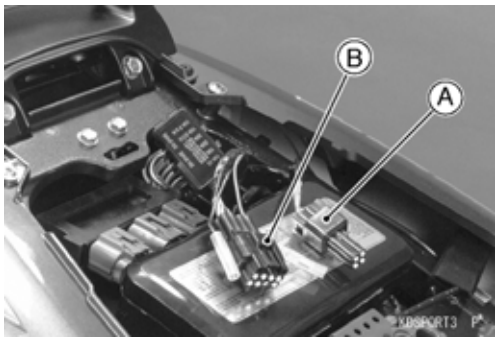


Fig. 3-2.9 Connection of ZX1400

3.2.10 KLE650

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.

A. Diagnostic Port for KDS (4-pin port)

Fig. 3-2.10 Connection of KLE650

3.2.11 ’07 ZR750/ZR1000

- o Remove the seat.
- o Remove the cover of Diagnostic Port [A].
- o First connect the Connection cable (57001-1699) to the diagnostic port on harness.
- o Second connect the Adapter cable.

A. Diagnostic Port for KDS (4-pin port)

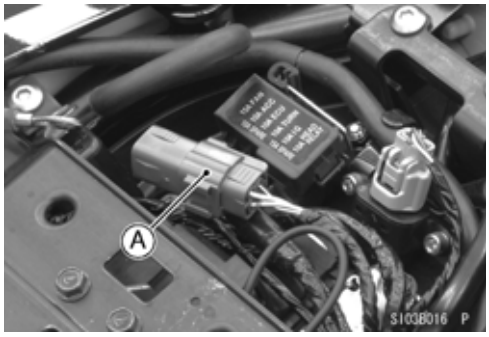


Fig. 3-2.11 Connection of ZR750 / ZR1000

3.2.12 JT1500B/JT1500C

- o Open the front storage compartment cover.
- o Remove the front storage case.
- o Push in the pins and remove the battery cover.
- o Connect the communication cable to the Diagnostic Port [A] near the battery.

A. Diagnostic Port for KDS (4-pin port)

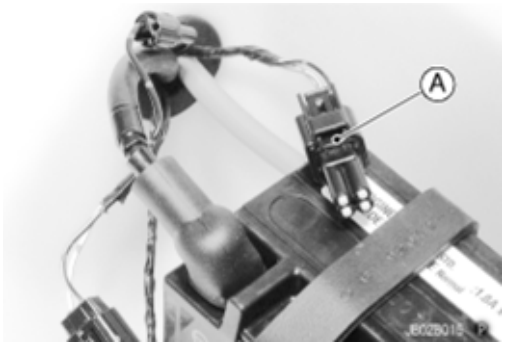


Fig. 3-2.12 Connection of JT1500B / JT1500C

- o Insert the Adapter cable (57001-1696) between the 6-pin connector [B] on harness.
- o Then connect the leads of the Adapter cable.

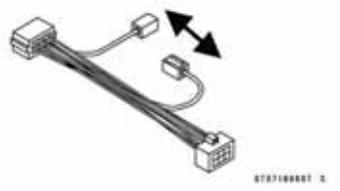


Fig. 3-2.12.1 Connection of JT1500B / JT1500C

3.2.13 KSF450B

- o Remove the cover of Diagnostic Port [A].
- o Connect the adapter cable to the diagnostic port on harness.
  The port is located under the front fender (left side).

A. Diagnostic Port for KDS (4-pin port)

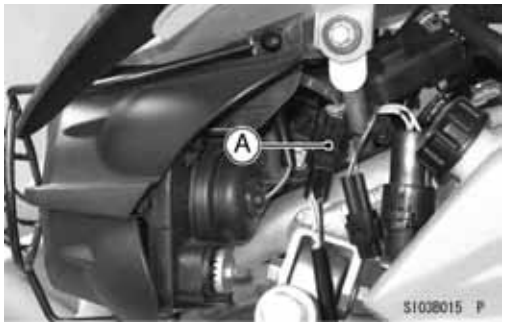


Fig. 3-2.13 Connection of KSF450B

3.2.14 VN1500-J/L/N/R

- o Remove the seat and battery holder.
- o Pull out the ECU from the case.
- o Remove the 8-Pin cover from ECU & connect the cable to 8-pin port of ECU

A. ECU

B. Communication Cable

Fig. 3-2.14 Connection of VN1500

Section 4: Menu Items

4.1 Menu Structure

The menu structure diagram and menu items outline are as shown in Fig. 4-1 and Table 4-a, followed by further explanation on each menu. Some functions are not available on all models.

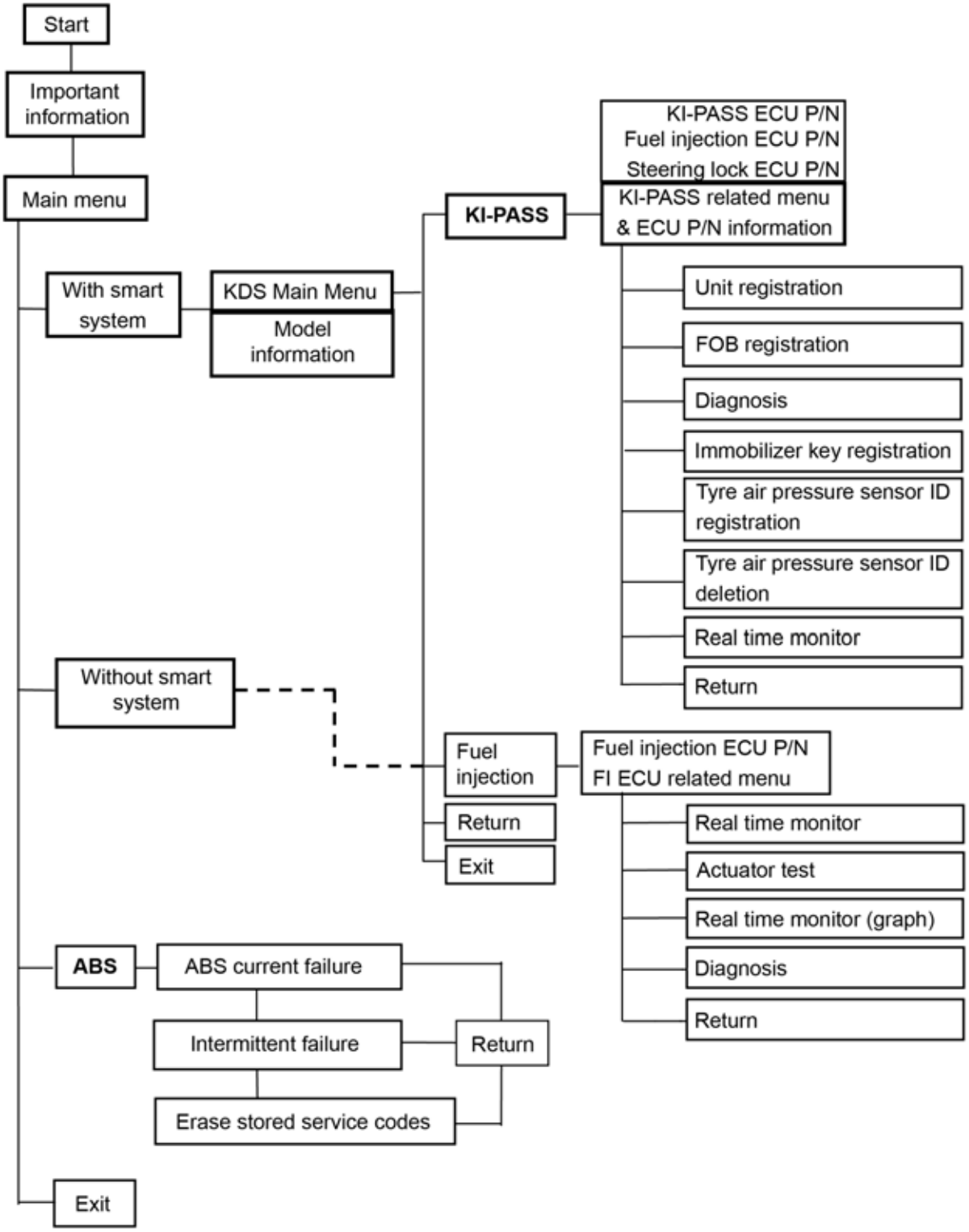


Fig. 4-1 Menu Structure

4.2 Function of Menu Items

Table 4-a Menu Feature

Menu Item	Description & Function
With Smart System	Select for ZG1400A/B
Without Smart System	Select for all non Smart equipped models
Model Information	Displays model information
KI-PASS	Select when diagnosing/servicing KI-PASS system and parts
KI-PASS Related Menu	Select when diagnosing/servicing KI-PASS system and parts
Unit Registration	Select when servicing Steering Lock Unit or FI ECU
FOB Registration	Select when registering FOB
Diagnosis	Select when diagnosing KI-PASS system
Immobilizer Key Registration	Select when registering Immobilizer Key
Tire Air Pressure Sensor ID registration	Select when registering TPMS ID
Tire Air Pressure Sensor ID deletion	Select when deleting TPMS ID
Real Time Monitor	Show current situation of KI-PASS system
Fuel Injection	Select when diagnosing FI system and parts
FI ECU Related Menu	Select when diagnosing/monitoring FI system and parts
Real Time Monitor	Displays engine running conditions and previous codes
Actuator Test	Run or stop the actuator
Graph	Draw and display the graph.
Real Time Monitor	Displays engine running conditions and previous codes.
Diagnosis	Displays self-diagnosing codes stored on the ECU
ABS	Select when diagnosing ABS system
ABS Current Failure	Show current failure of ABS system
Intermittent Failure	Show previous failure of ABS system
Erase Stored Service Codes	Erase service codes

Section 5: KDS 3 Operation for KI-PASS System

The ZG1400A/B KI-PASS (Smart) system requires code verification for the ECU units to function correctly.

5.1 Starting KDS 3

- Turn on the PC
- Start KDS Version 3 from the start menu. Or double-click the **KDS 3** icon on the desktop screen.

Fig. 5-1 KDS 3 icon

Fig. 5-2 will appear.

- Read the instructions and perform the preliminary inspection.
- Select **OK** after performing the preliminary inspection.

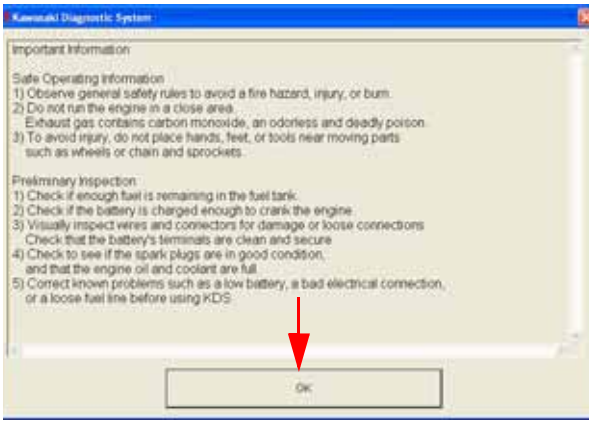


Fig. 5-2 Important Screen

Fig. 5-3 will appear.

- On Smart System equipped models, select **With Smart System.**

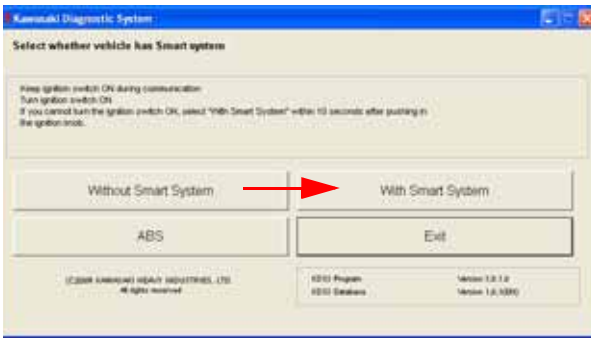


Fig. 5-3 Main Menu

- The KDS Main Menu and Model Information screen will appear.
- Select **KI-PASS.**

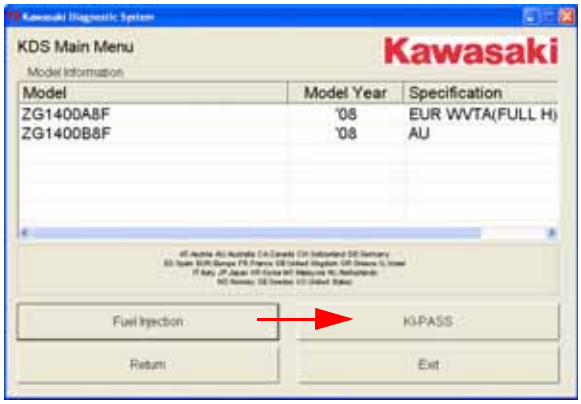


Fig. 5-4 Main Menu & Model Information

- Select one of the options from the KI-PASS Related Menu

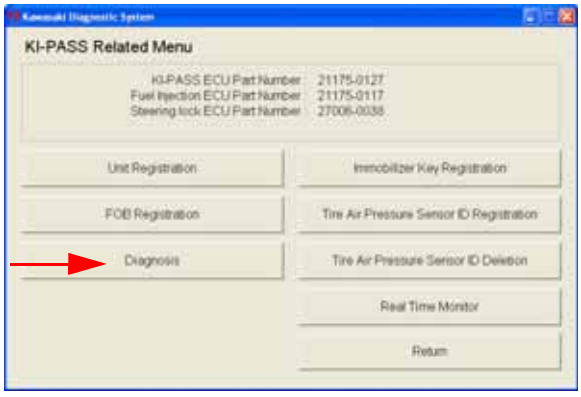


Fig. 5-5 KI-PASS Related Menu & ECU Part Number

5.2 Diagnosis.

- Select **Diagnosis** on the KI-PASS Related Menu to display current failure codes

Fig. 5-6 is a sample screen.

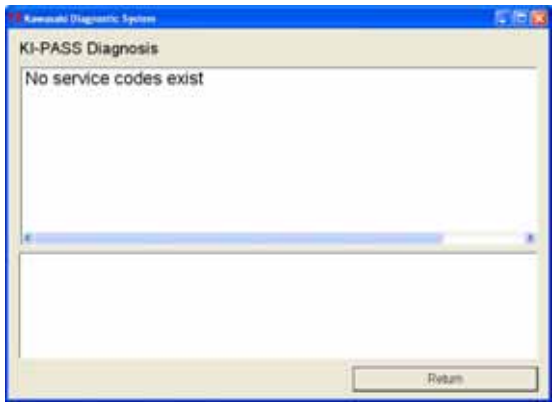


Fig. 5-6 Diagnosis

5.3 Real Time Monitor

- To display current KI-PASS component condition, select **Real Time Monitor** in the KI-PASS Related Menu.

Fig. 5-7 is a sample screen.

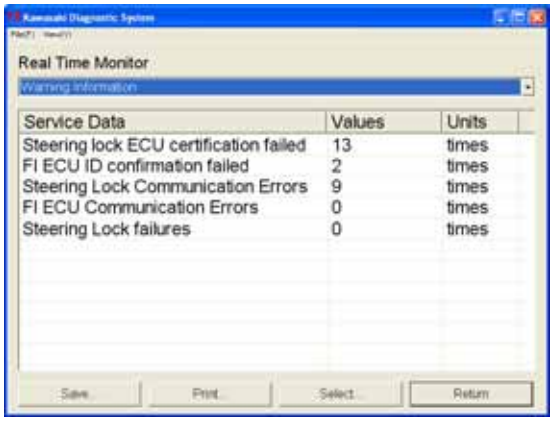


Fig. 5-7 Real Time Monitor

5.3.1 Selecting Display Items

- First select the group from the pull down menu.
  There are four groups:
  Engine Information,
  Warning Information,
  Monitoring Information, and
  All Information.

  All Information includes Engine, Warning and Monitor Information.
- Choose **Select**.

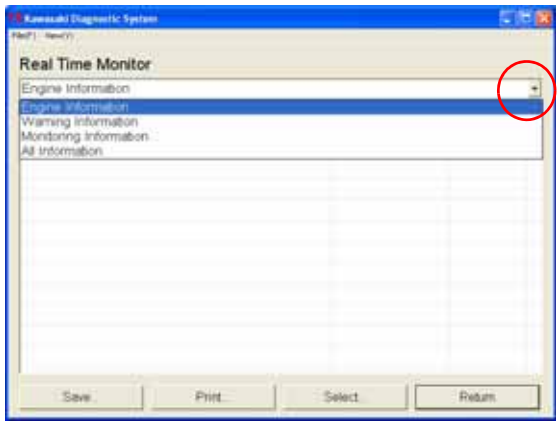


Fig. 5-8 Real Time Monitor

Fig. 5-9 will appear.

- Select items and then select **OK**

  On this screen, items can be selected and displayed for service information.

NOTE

~ *Use the "space" key to check or uncheck each item for display purpose.*

~ *Press the "arrow" keys (upward or downward) on the keyboard to move the items.*

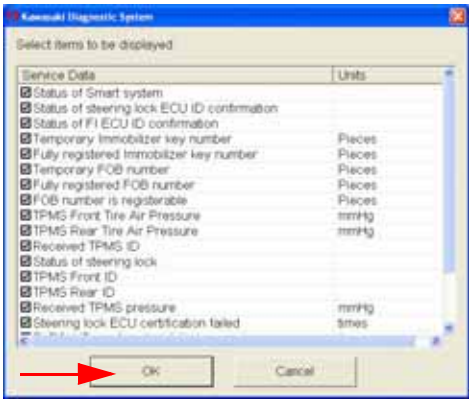


Fig. 5-9 Select Items

Fig. 5-10 is a sample screen

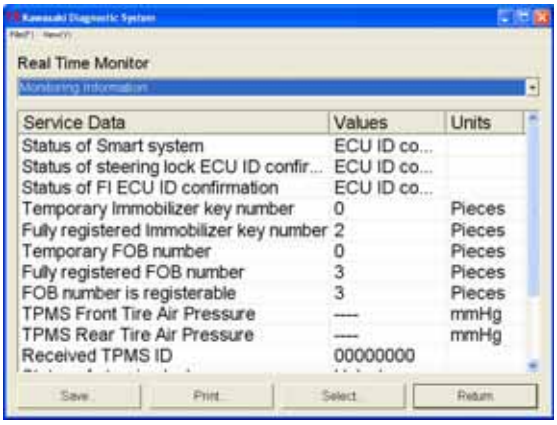


Fig. 5-10 Real Time Monitor

NOTE

~ *To see the screen more clearly, you can maximize the screen and enlarge the column widths (Fig. 5-11).*

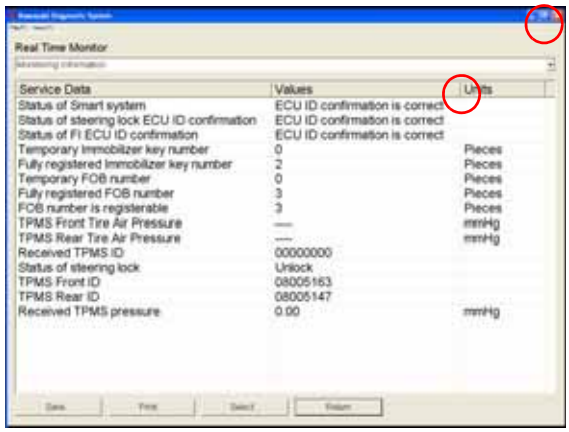


Fig. 5-11 Real Time Monitor

5.3.2 Saving Service Data

Data obtained through communication with the ECU can be saved.

- Select **Save** (Fig. 5-11).
- Select one option and then select **OK** (Fig. 5-12).

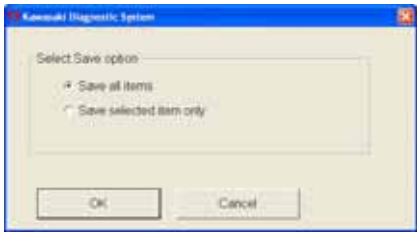


Fig. 5-12 Select Save Option

- Enter comment then select **OK** (Fig. 5-13).

Fig. 5-13 Comment (sample)

- Fig. 5-14 appears. Select a folder and select **Enter** or **Save** to save the data as a CSV file.
  By default, the file name will consist of YY(year)MM(month)DD(day) and two incremental numeric digits (00-99). ECU Parts No., Model Name, Model Year & Specification are saved automatically in the data.

  NOTE:
  CSV: comma separated value

Fig. 5-14 Save Folder (sample)

- A message will appear after saving the file. Select **OK** (Fig. 5-15).

Fig. 5-15 Save Completed

5.3.3 Printing

Data obtained through communication with the ECU can be printed.

- Select **Print** (Fig. 5-11).

Fig. 5-16 will appear.

- Select a print option and select **OK** to print.
  - ~ *If a printer is not connected to the PC, a screen print will be created.*
- Select **Cancel** to return to the previous screen.

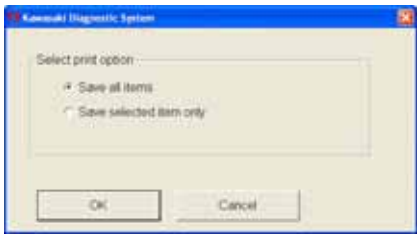


Fig. 5-16 Print Option

5.4 Tire Air Pressure Measuring System (TPMS) Sensor Replacement

When a TPMS sensor is replaced, the replacement sensor's ID must be registered with the Smart ECU.

5.4.1 Deleting TPMS ID.

- Select **Tire Air Pressure Sensor ID Deletion** on the KI-PASS Related Menu.

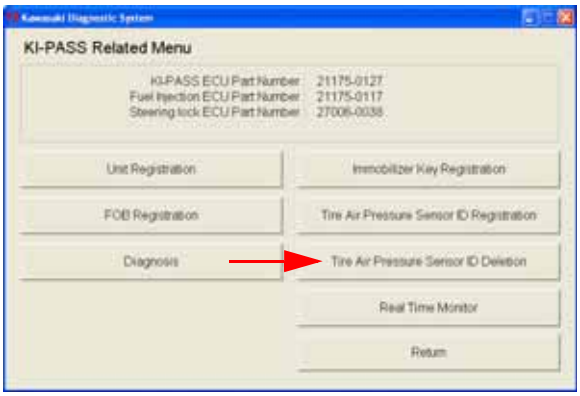


Fig. 5-17 KI-PASS Related Menu

- Currently registered sensor IDs are shown (Fig. 5-18).
- Select the wheel sensor to delete. In this example the Front Wheel is selected.

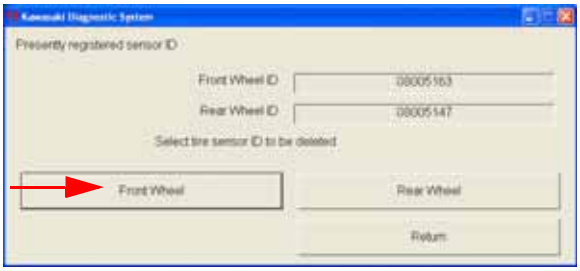


Fig. 5-18 TPMS ID

- When Fig. 5-19 appears select **Yes**

Fig. 5-19 TPMS ID Deletion

- Next Fig. 5-20 appears, select **OK**

Fig. 5-20 TPMS ID Deletion OK Screen

o On Fig. 5-21 the Front Wheel ID is changed to 00000000. Next select **Return**

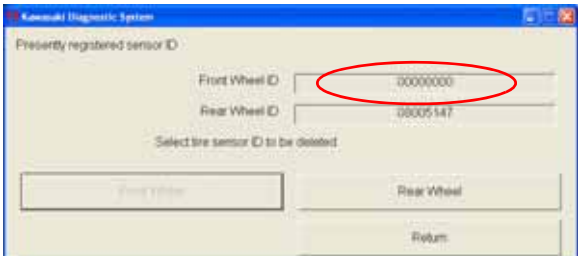


Fig. 5-21 TPMD ID Deletion

o Prepare a new TPMS sensor and record the ID.
  ~ *TPMS sensors cannot be registered without ID registration.*
o Replace the front TPMS sensor.
o Select TPMS ID Registration on the KI-PASS Related Menu screen.

o Fig. 5-22 appears, select **Front Wheel**.

Fig. 5-22 TPMD ID Registration

o When Fig. 5-23 appears, input the new TPMS ID and select **Registration**.

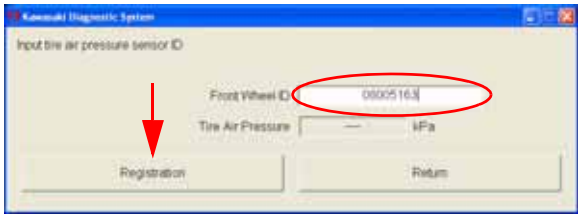


Fig. 5-23 TPMS ID Registration

o Fig. 5-24 appears, select **Yes**.

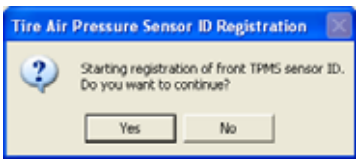


Fig. 5-24 TPMS ID Registration

o Fig. 5-25 appears, select **OK**.

Fig. 5-25 TPMS ID Registration

Fig. 5-26 appears.

o Select **Return**.

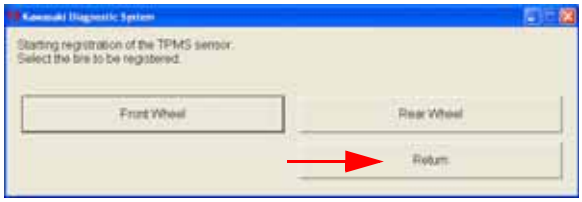


Fig. 5-26 TPMS ID Registration

o To confirm the new TPMS ID is registered correctly, go to **Real Time Monitor** screen (Fig. 5-27)

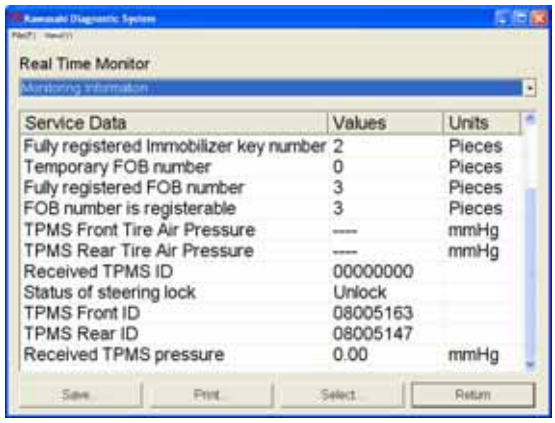


Fig. 5-27 Registration Confirmation

5.5 Fob Registration

To register an additional fob or to re-register an existing fob:

NOTE

~ *The maximum number of fobs that can be registered is 6. The motorcycle comes with 2, and an additional 4 can be registered. A fob's memory slot in the Smart ECU cannot be erased.*

5.5.1 Additional Fob Registration

o Select **Fob Registration** on the KI-PASS Related Menu (Fig. 5-28).

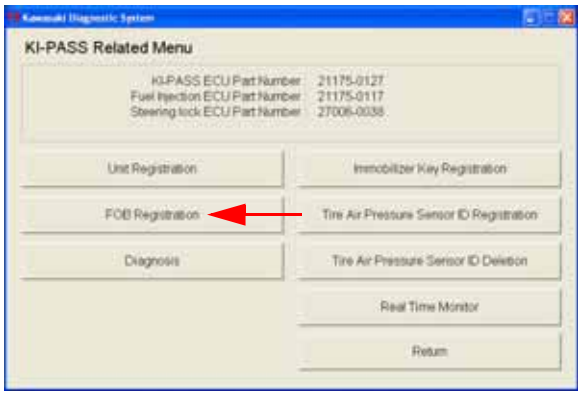


Fig. 5-28 KI-PASS Related Menu Screen

- Current information is displayed (Fig. 5-29).
  - ~ *Two fobs are registered to the Smart ECU during production.*
- Select **Additional Registration** if you want to register additional fobs.

Fig. 5-29 Fob Registration Screen

Fig. 5-30 appears.

- Input the new fob ID, then select **Additional Registration** with the new fob placed close to the Smart ECU.

NOTE

- ~ *The new fob's ID is located on the shipping package.*

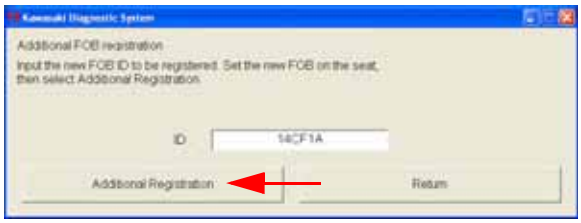


Fig. 5-30 Fob Registration

Fig. 5-31 appears.

- Select **OK**.

Fig. 5-31 Fob Registration

Fig. 5-32 appears.

- Select **Return** if you are finished, or **Additional Registration** to register another fob.

Fig. 5-32 Fob Registration

Fig. 5-33 is a sample of an additional registration.

- Enter the fob's ID number and select **Additional Registration**.

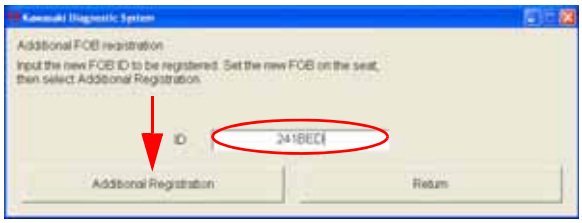


Fig. 5-33 Additional Registration

Fig. 5-34 appears.

- Select **Return** if completed.

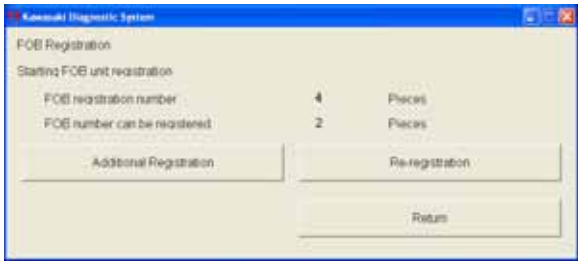


Fig. 5-34 Additional Registration

5.5.2 Fob Re-registration

- Select **Re-registration** (Fig. 5-34). Select **OK** (Fig. 5-35). In this example there are 3 fobs.

Fig. 5-35 Re-registration

- Fig. 5-36 appears confirming the number of fobs, select **Yes**.

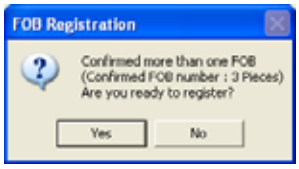


Fig. 5-36 Re-registration

Fig. 5-37 appears.

- Select **Return** if completed.

Fig. 5-37 Re-registration

5.6 Immobilizer Key Registration (Smart ECU Replacement)

To register the Immobilizer keys supplied with a new Smart ECU:

- Select **Immobilizer Key Registration** on the KI-PASS Related Menu (Fig. 5-38).

Fig. 5-38 KI-PASS Related Menu

Fig. 5-39 appears.

- Select **Immobilizer Key Registration**.

Fig. 5-39 Immobilizer Key Registration

Fig. 5-40 appears.

Fig. 5-40 Immobilizer Key Registration

- Remove the key from the fob. Place the fob's cutout (where the head of the key was located) over the projection in front of the ignition switch (See Fig. 5-41).

Fig. 5-41 Location of Key

Fig. 5-42 appears, select **OK**.

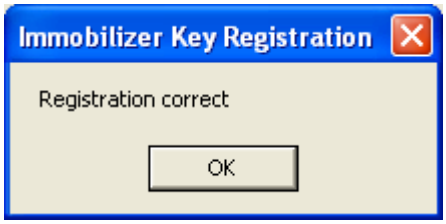


Fig. 5-42 Key Registration OK

A confirmation screen will appear. (Fig. 5-43).

- To register more fobs, repeat the procedure. When Fig. 5-41 appears, select **OK**.

Fig. 5-43 Updated Immobilizer Key Registration

Fig. 5-44 appears.

- When all fobs have been registered, select **Confirm changed item**.

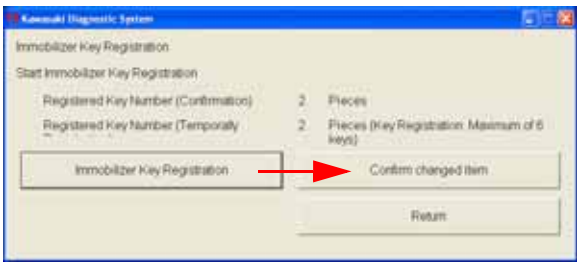


Fig. 5-44 Confirmed Key Registration

Fig. 5-45 appears

- Select **Yes**.

Fig. 5-45 Key Registration

Fig. 5-46 appears.

- Select **OK**.

Fig. 5-46 Confirmation

Fig. 5-47 appears.

- Select **Return** to complete the process.

Fig. 5-47 Confirmation

5.7 FI ECU Replacement

To replace the FI ECU:

- Select **Unit Registration** on the KI-PASS Related Menu. (Fig. 5-48).

Fig. 5-48 KI-PASS Related Menu

- Select **FI ECU**, then select **Registration** (Fig. 5-49).

Fig. 5-49 FI ECU Selection

Fig. 5-50 appears.

- Select **Yes**.

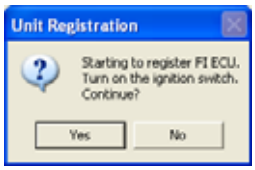


Fig. 5-50 FI ECU Selection

Fig. 5-51 appears.

- Select **OK**.

Fig. 5-51 FI ECU Registration

Fig. 5-52 appears.

- Select **Return**.

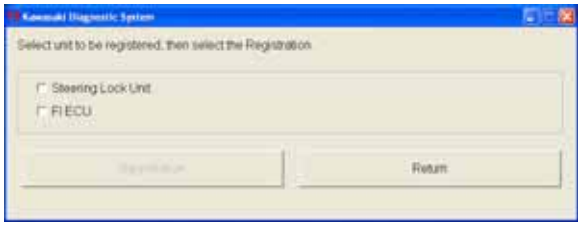


Fig. 5-52 FI ECU Registration

Fig. 5-53 appears.

- Select **OK**.

This completes the registration process.

Fig. 5-53 ECU Registration

5.8 Steering Lock Unit (ECU) Replacement

To replace the Steering Lock ECU:

- Replace the Steering Lock Unit.
- Start KDS 3 and go to the Main Menu, but do not select any options yet.
- *Depress the steering lock switch (do not turn switch). Select* **With Smart System** *within 10 seconds* (Fig. 5-54).

Fig. 5-54 KDS Main Menu

Fig. 5-55 appears.

- Select **Steering Lock Unit Registration**.

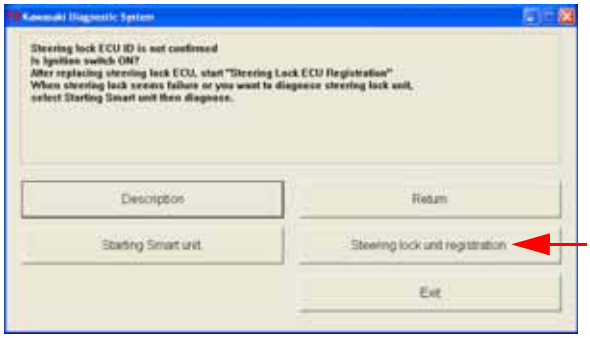


Fig. 5-55 Selection

Fig. 5-56 appears.

- Select **Yes**.

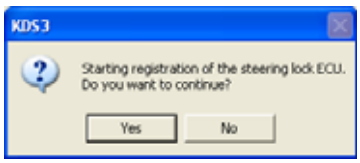


Fig. 5-56 Starting Registration

Fig. 5-57 appears.

- Select **OK**.

Fig. 5-57 Registration

Fig. 5-58 appears.

- Select **OK**.

Re-start KDS 3 and turn ON the vehicle.

Fig. 5-58 Registration Finished

5.9 Smart ECU Replacement

To replace the Smart ECU:

The Smart ECU is provided with two fob keys as a set.

- Replace the Smart ECU.
- Start KDS 3 and go to the Main Menu (Fig. 5-59), *but do not select any options yet*.
- After depressing the steering lock switch (do not turn switch), select **With Smart System**.
- Register the steering lock unit as outlined in section 5.8.

Fig. 5-59 KDS Main Menu

- On completion of this procedure KDS 3 will close.
- Confirm the release of the steering lock by pushing the switch ON.
- Confirm meter operation by turning on the ignition switch.
- After turning the ignition switch ON, reconnect KDS 3 and register the Immobilizer Keys and TPMS sensors according to sections 5.6 and 5.4.

5.10 Smart System Parts Replace and KDS 3 Operation

No	Replacement Parts					KDS 3 Operation	Remarks
	Steering Lock ECU	Smart ECU	FI ECU	TPMS	Fob Key		
1	o	-	-	-	-	①Start KDS. ②Steering lock push-switch ON, then start communication. ③Register steering lock unit compulsory. ④KDS closes. After steering lock switch ON, confirm the release of steering lock.	o Steering lock unit ID is necessary for Smart ECU registration.
2	-	o	-	-	o	①Start KDS. ②Steering lock push-switch ON, then start communication. ③Register steering lock unit compulsory. ④KDS closes. After steering lock switch ON, confirm the release of steering lock. ⑤Confirm meter initialization. ⑥Ignition switch ON, register immobilizer key and TPMS.	o Steering lock unit ID o FI-ECU ID o Immobilizer ID o TPMS ID
3	-	-	o	-	-	① Ignition switch ON, Start KDS. ② Register FI-ECU compulsory. ③After steering lock switch ON, confirm the release of steering lock. Confirm meter initialization.	o FI-ECU ID
4	-	-	-	o	-	① Ignition switch ON, Start KDS. ② Register TPMS sensor ID.	o TPMS ID
5	o	o	-	-	o	①Start KDS. ②Steering lock push-switch ON, then start communication. ③Register steering lock unit compulsory. ④KDS closes. After steering lock switch ON, confirm the release of steering lock. ⑤Confirm meter initialization. ⑥Ignition switch ON, register immobilizer key and TPMS.	o Steering lock unit ID o FI-ECU ID o Immobilizer ID o TPMS ID
6	-	o	o	-	o	①Start KDS. ②Steering lock push-switch ON, then start communication. ③Register steering lock unit compulsory. ④KDS closes. After steering lock switch ON, confirm the release of steering lock. ⑤Confirm meter initialization. ⑥Ignition switch ON, register immobilizer key and TPMS.	o Steering lock unit ID o FI-ECU ID o Immobilizer ID o TPMS ID
7	o	-	o	-	-	①Start KDS. ②Steering lock push-switch ON, then start communication. ③Register steering lock unit compulsory. ④KDS closes. After steering lock switch ON, confirm the release of steering lock. ⑤Confirm meter initialization.	o Steering lock unit ID o FI-ECU ID
8	o	o	o	-	o	①Put No.1 fob close to steering lock and push-switch ON. ②Registering immobilizer key, show “Registration OK”, if not, show “Registration no good”. ③ Put No.2 fob close to steering lock and push-switch ON. ④If immobilizer key is registered successfully, automatically write the ID to steering lock ECU and display the mark which show ignition switch ON. ⑤If ignition switch ON, write the ID to the FI-ECU, and initialize the Meter unit.	o Steering lock unit ID o FI-ECU ID o Immobilizer ID o TPMS ID
9	-	-	-	-	o	When all fob keys are lost, Smart ECU must be replaced. The same operation with No. 2 is necessary. When registering additional fob, minimum one available fob is necessary.	o New fob ID

Section 6: KDS 3 Operations for FI System

6.1 Starting KDS 3

- Turn on the PC.
- Start KDS Version 3 from the start menu. Or double-click the **KDS 3** icon on the desktop screen.

Fig. 6-1 KDS 3 icon

Fig. 6-2 will appear.

- Read the instructions and perform the preliminary inspection.
- Select **OK** after performing the preliminary inspection.

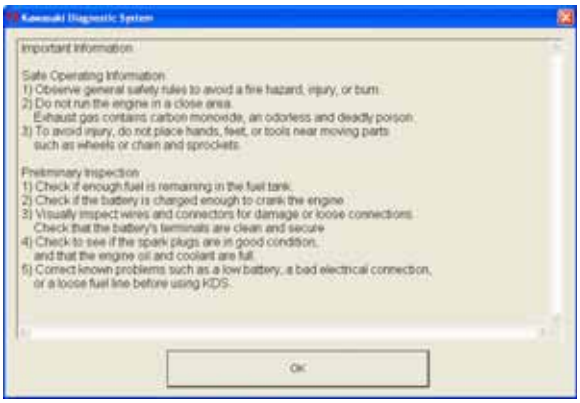


Fig. 6-2 Inspection

Fig. 6-3 will appear.

- ~ *On Smart System equipped models, select* **With Smart System**.
- ~ *On non-Smart System equipped models, select* **Without Smart System**.

Fig. 6-3 Main Menu

The KDS Main Menu and Model Information screen will appear (Fig. 6-4).

o Select **Fuel Injection**.

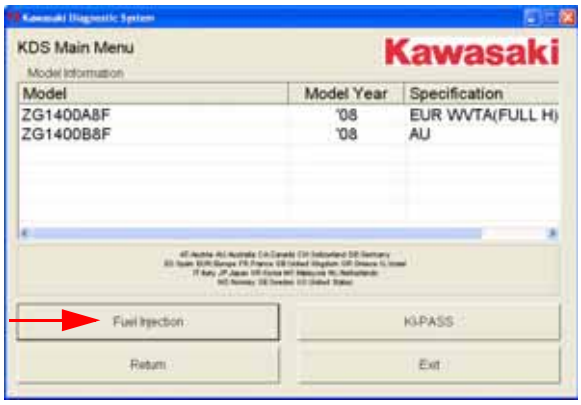


Fig. 6-4 KDS Main Menu and Model Information

FI ECU Related Menu will appear (Fig. 6-5).

o Select one of the following:

- ~ *Real Time Monitor*
- ~ *Actuator Tests*
- ~ *Real Time Monitor (Graph)*
- ~ *Diagnosis*

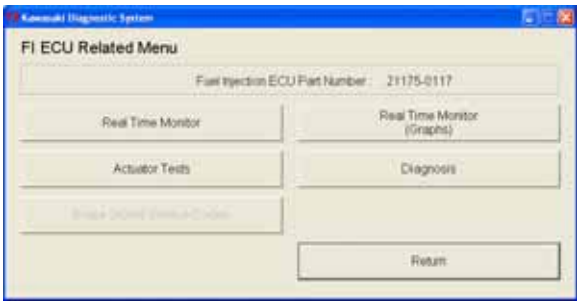


Fig. 6-5 FI ECU Related Menu

6.2 Real Time Monitor

Fig. 6-6 appears after selecting the **Real Time Monitor** on the FI ECU Related Menu. Component values and warning information from the ECU can be viewed on screen.

Up to 10 items can be displayed simultaneously, service data can be saved or printed.

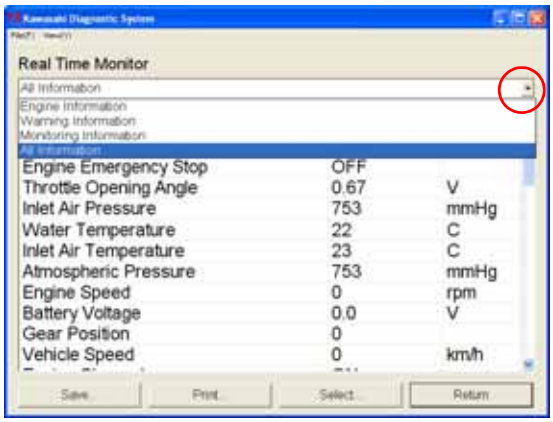


Fig. 6-6 Real Time Monitor

6.2.1 Selecting Display Items

o Select a group from the pull down menu (Fig. 6-6).
Select Engine, Warning, Monitoring, or All Information.
All Information includes Engine, Warning, and Monitoring.

o Click **Select** (Fig. 6-6).

Fig. 6-7 will appear.
On this screen, items can be selected and displayed for service information.

NOTE

~ *Use the* **space** *key to check or uncheck each item for display purpose.*

~ *Press the* **arrow** *keys (upward or downward) on the keyboard to move the items.*

o To confirm your selection, select **OK** or press the **Enter** key. To return to the previous selection, select **Cancel**.

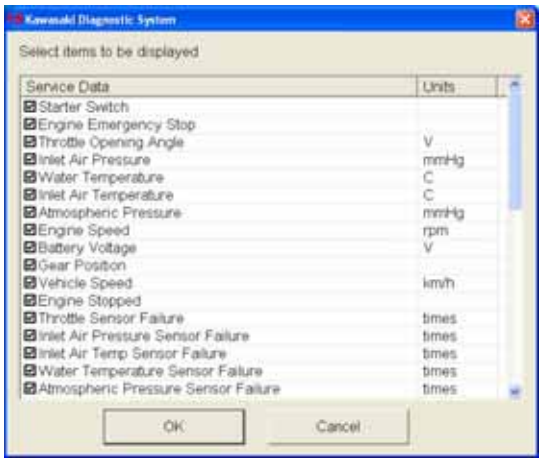


Fig. 6-7 Select Items

Fig. 6-8 is a sample of **All Information**.

~ *Other items selected to be monitored can be seen by selecting the scroll button or moving the scroll bar.*

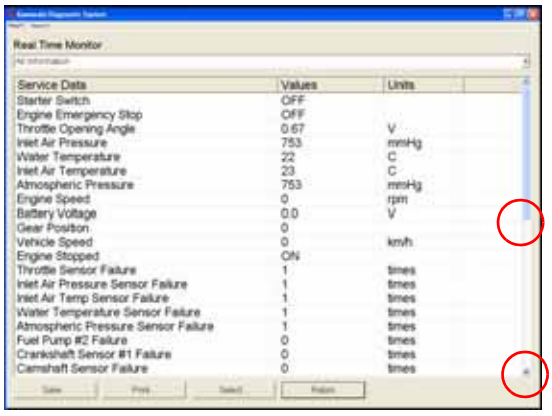


Fig. 6-8 Real Time monitor

Selection of units

o Select **View(V)** located on the upper Tool Bar, then select **Unit(U)**.

Fig. 6-9 appears.

o Select units from pull down menu.

o After confirming the units, select **OK**.

Once units are selected they will be applied to all displays.

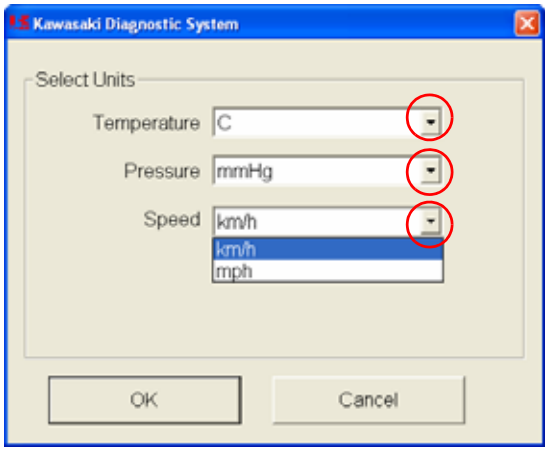


Fig. 6-9 Unit Selection

6.2.2 Saving Service Data

Data obtained through communication with the ECU can be saved.

o Select **Save** (Fig. 6-8).

Fig. 6-10 will appear.

o Select an option and then select **OK**.

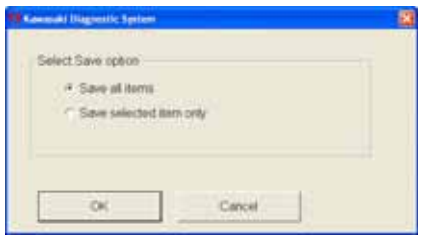


Fig. 6-10 Select Save Option

o Enter comment then select **OK** (Fig. 6-11).

Fig. 6-11 Comment (sample)

Fig. 6-12 appears.

o Select a folder and press **Enter** or **Save** to save the data under a CSV file.
The file name by default will consist of YY(year)MM(month)DD(day) and two incremental numeric digits (00-99). ECU Parts No., Model Name, Model Year, and Specification are saved automatically in the data.

NOTE:

CSV: comma separated value

Fig. 6-12 Save Folder (sample

o A message will appear after saving the file. Select **OK**.

Fig. 6-13 Saving Completed

6.2.3 Printing

All or selected data from the ECU can be printed.

By Clicking **Print** at Fig. 6-8, Fig. 6-14 appears.

- o Select a print option and select **OK** to print.
  - ~ *If a printer is not connected to the PC, a screen print will be created.*
- o Select **Cancel** to return to the previous screen.

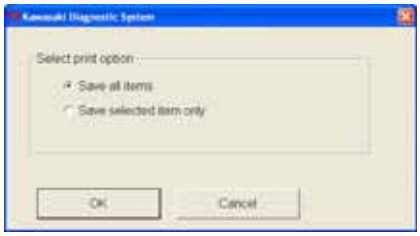


Fig. 6-14 Print Option

6.3 Diagnosis

- o Select **Diagnosis** on the FI ECU Related Menu. (Fig. 6.5).

- o If there are no failures, the message **No service codes exist** appears.
- o If a failure exists, it will be listed.

Note

- ~ *Five items or less can be displayed at a time.*
- ~ *Select the scroll button to see the messages*

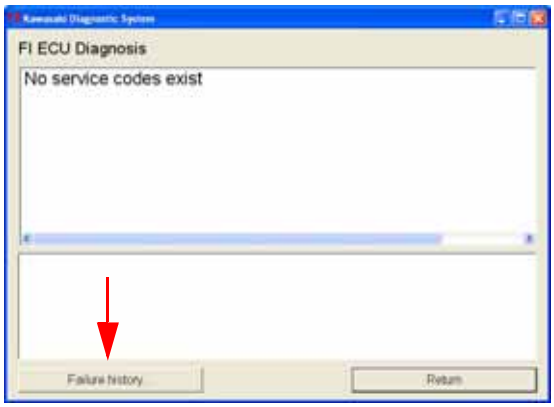


Fig. 6-15 FI ECU Diagnosis

- o Select **Failure history** (Fig. 6-15) to see previous problems.
  - ~ *Latest three records are shown.*
  - ~ *On some models latest two records are shown.*

Note

- ~ *From the pull down menu you can select Engine, Warning, Monitoring or All Information.*
- ~ *Failure history can be saved and printed in the same way as the Real Time Monitor.*

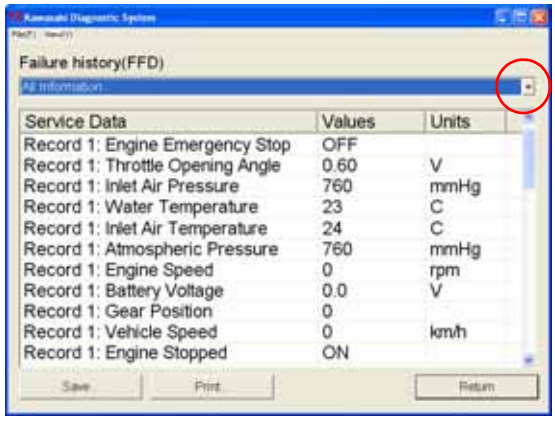


Fig. 6-16 Failure history

6.4 Actuator Test

To perform an Actuator Test select **Actuator Tests** on the FI ECU Related Menu.

- o First, select **Actuator Test** item.
- o Second, select display items.
  - ~ *While the test is running, the parameter values will be displayed.*
  - ~ *Up to five parameters can be displayed at a time. Click the scroll buttons to scroll by line.*

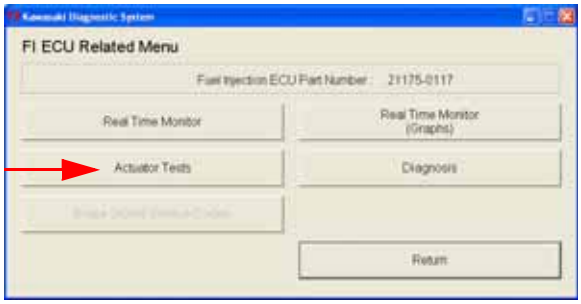


Fig. 6-17 FI ECU Related Menu

6.4.1 Selecting Test Item

Fig. 6-18 appears after **Actuator Tests** is selected.

- o Select the test item from the pull down menu list.

NOTE

- ~ *Available actuator test items for each model are displayed on the screen.*

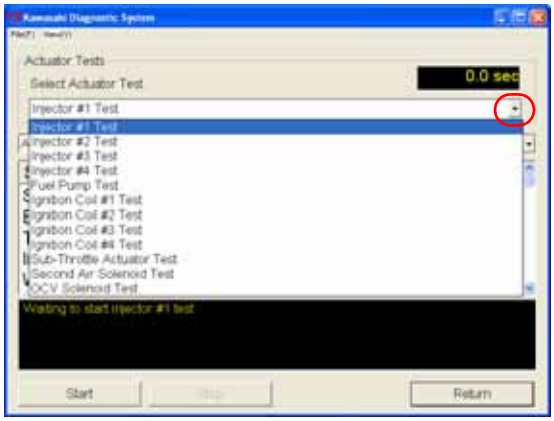


Fig. 6-18 Actuator test selection

6.4.2 Selecting Display Items

After selecting the actuator test item, select **Engine Information** in the combo box.
The procedure is the same as **6.2.1**.

6.4.3 Injector Operation Test

- o Select Injector number to be tested
- o Select display items.
- o Run engine at idle speed.
- o Select **Start** to begin test (Fig. 6-19).

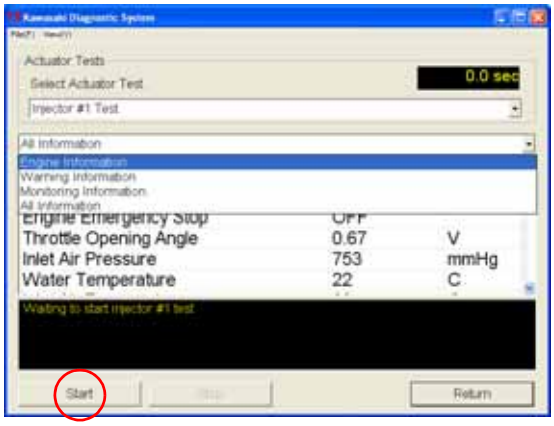


Fig. 6-19 Injector Test

- While the engine is running, monitor the change in Engine Speed (and listen to the engine).

Fig. 6-20 is a sample of the injector operation test.

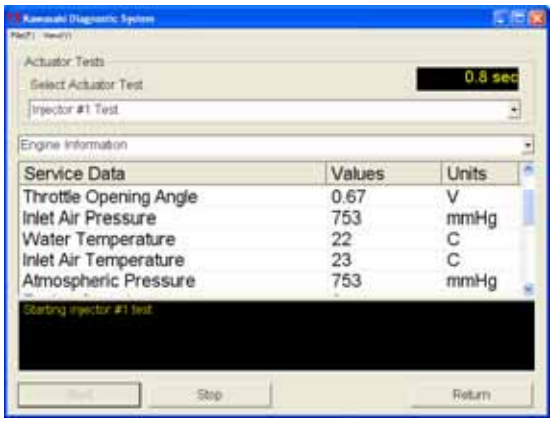


Fig. 6-20 Injector Test

Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically.

Fig. 6-21 shows the injector test has been completed.

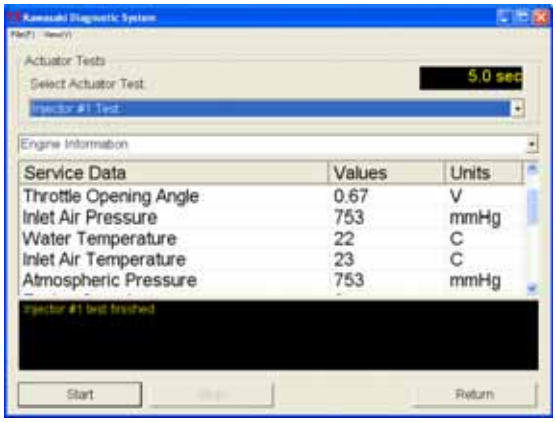


Fig. 6-21 Test Completed

6.4.4 Fuel Pump Test

- Select **Fuel Pump Test** from the pull down menu and select **OK**.
- Select display items.
- Make sure the engine is not running and select **Start**.

Fig. 6-22 is displayed when performing the test.

- Listen carefully for the sound of fuel pump operation. If the operating sound is not heard, the fuel pump and/or its electrical circuit have failed.
- Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically.

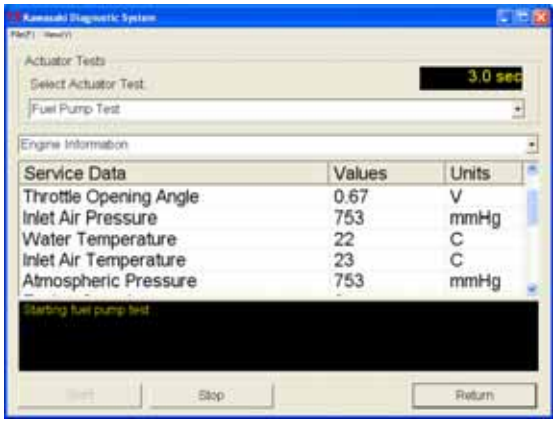


Fig. 6-22 Fuel Pump Test

6.4.5 Ignition Coil #No Test

- o Select **Ignition Coil #No. Test** from the pull down menu then select **OK**.
- o Select display items.
- o Make sure the engine is not running and then select **Start**.

NOTE

~ *Before performing the Ignition coil test, remove the spark plugs from the cylinder head.*

Fig. 6-23 is displayed during test.

- o Confirm spark at the plugs.
- o Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically.

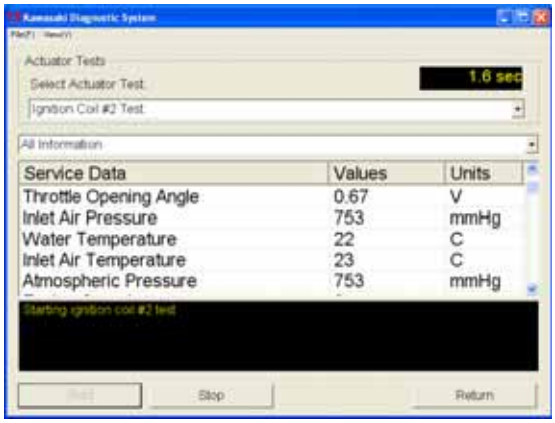


Fig. 6-23 Ignition Coil Test

6.4.6 Sub Throttle Valve Actuator Test

- o Select **Sub Throttle Actuator Test** from the pull down menu and select **OK**.
- o Select display items.
  Sub Throttle Opening Angle should be selected for this test.
- o Make sure the engine is not running and then select **Start**.

Fig. 6-24 is displayed when performing the test.

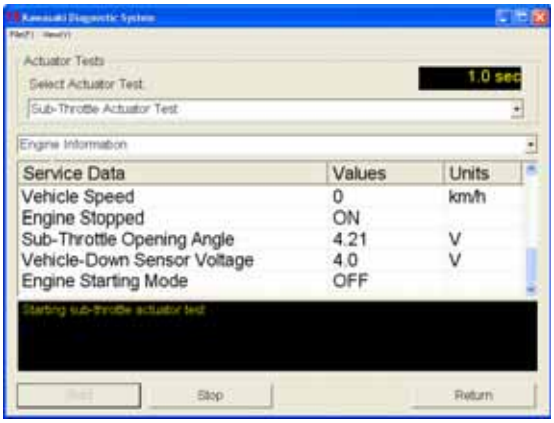


Fig. 6-24 Sub Throttle Actuator Test

- o Monitor the voltage of the Sub Throttle Actuator Opening Angle (and listen for the sound of actuator operation).

  If the Voltage goes above 3.8 volts, the actuator is operating correctly. Refer to the data in the service manual.

  Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically

6.4.7 Second Air Solenoid Test

- Select **Second Air Solenoid Test** and select **OK**.
- Select **Display Items**.
- Make sure the engine is not running and then select **Start**.

Fig. 6-25 is displayed when performing the test.

- Listen for the sound of solenoid operation. If the operating sound is not heard, the solenoid or it's circuit has failed.
- Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically.

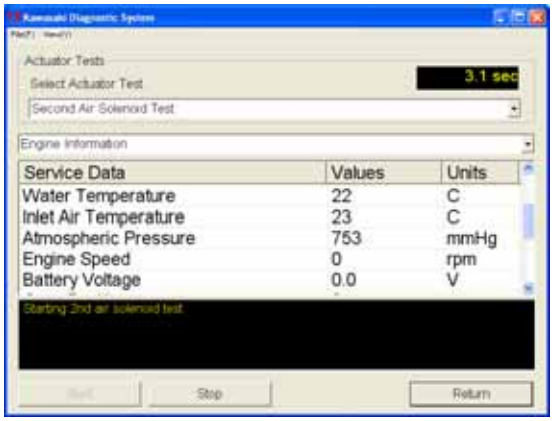


Fig. 6-25 Second Air Solenoid Test

6.4.8 OCV Solenoid Test

- Select **OCV Solenoid Test** and then select **OK**.
- Select display items.
- Make sure the engine is not running and then select **Start**.

Fig. 6-26 is displayed when performing the test.

- Listen for the sound of solenoid operation.

  If the operating sound is not heard, the solenoid or it's circuit has failed.
- Select **Stop** to finish testing. The test lasts for about 5 seconds and will stop automatically

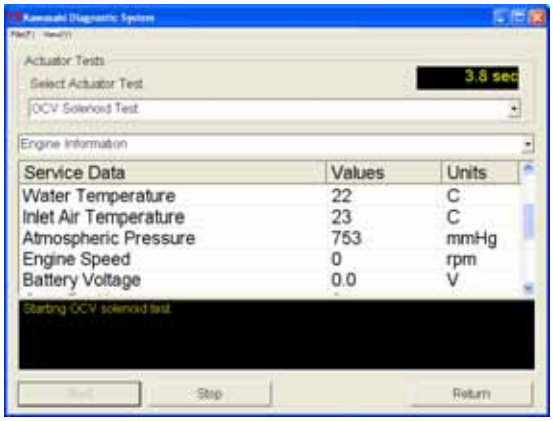


Fig. 6-26 OCV Solenoid Test

6.5 Real Time Monitor (Graph)

The graph operates while the engine is running.

Parameter values from the ECU will be shown on the graphs.

Up to three graphs can be displayed and drawn for up to twenty seconds. They are drawn by scrolling point by point.

Simultaneously, numerical values are displayed on screen.

6.5.1 Graph Display Items Selection

Select **Real Time Monitor (Graph)** from the FI ECU Related Menu, then **Select**.

Fig. 6-27 appears.

- o Select the item(s) on the pull down menu, then **OK** or press the **Enter** key to confirm.
- o Select **Cancel** to stop.

Fig. 6-27 Selecting Items

6.5.2 Displaying Graphs

- o Select **Start** to display the graphs.
- o Select **Stop** to stop.

NOTE

~ *When displaying the graphs, the* **Start** *button changes to a* **Stop** *button.*

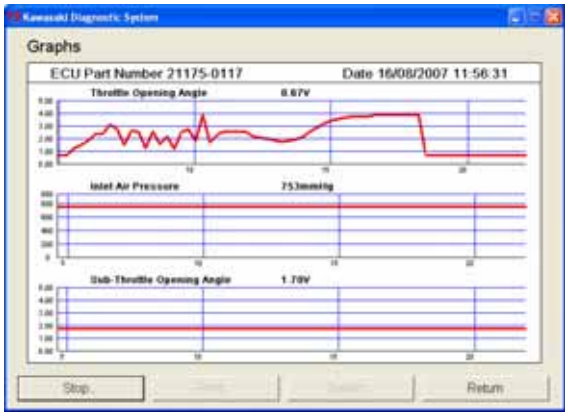


Fig. 6-28 Graph (sample)

6.5.3 Printing

- o After selecting **Print**, Fig. 6-29 will appear.
- o Select the start time, and then select **OK** to begin printing. (Print size: A4).
  Select **Cancel** to stop printing and return to the original screen.

Fig. 6-29 Printing Graph

- o When printing has finished, the completion screen appears. Select **OK**.

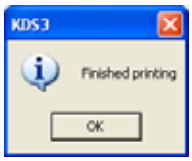


Fig. 6-30 Printing Completed

Section 7: KDS for ABS System

7.1 Outline

KDS for ABS has been developed as an optional function of KDS 3.

This software can be used on models equipped with ABS, such as the EX650B, ER650B, ZX1400B, and ZG1400A.

7.2 Installing the Software

The software is installed at the same time as KDS Version 3 and the icon will be visible on the desktop screen, as in Fig. 7-1.

Fig. 7-1 KDS 3 icon

7.3 Connection of the Cable

Fig. 7-2 shows a sample connection of KDS for ABS.

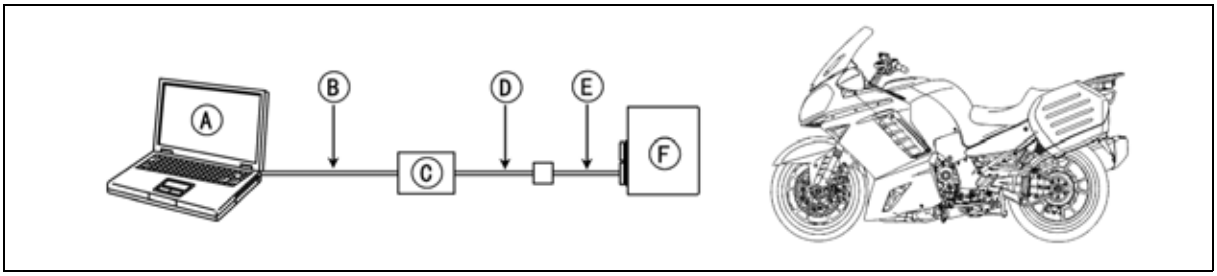


Fig. 7-2 Sample connection of KDS-ABS system

A: Personal Computer (PC) B: USB cable

C: Converter (**57001-1648**) D: Communication cable (6-pin/8-pin cable (**57001-1649**))

E: 8-pin connector to main harness F: ABS ECU

7.3.1 ZG1400A

- Remove seat.
- Locate the 8-pin connector [A] on the main harness and remove the cover (ABS port).
- Connect cable 57001-1649 [B] to the 8-pin ABS port.
- Connect the 6-pin connector on the 57001-1649 to the Adapter [C].
- Connect the computer's USB cable [D] to the Adapter.

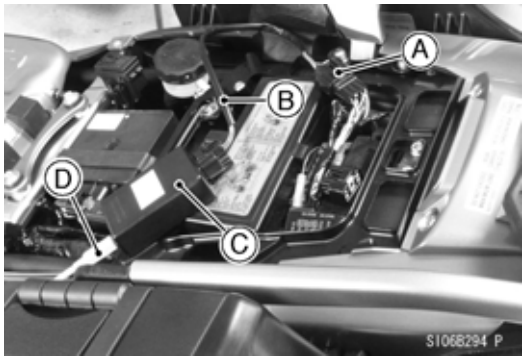


Fig. 7-3 ABS Port on ZG1400A

7.3.2 ER650B/EX650B

- o Remove seat.
- o Remove the ABS Port [B] cover.
- o Connect the 8-pin connector on 57001-1649 to the ABS port.

A. Diagnostic Port for KDS (4-pin port)
B. Diagnostic Port for ABS (8-pin port)

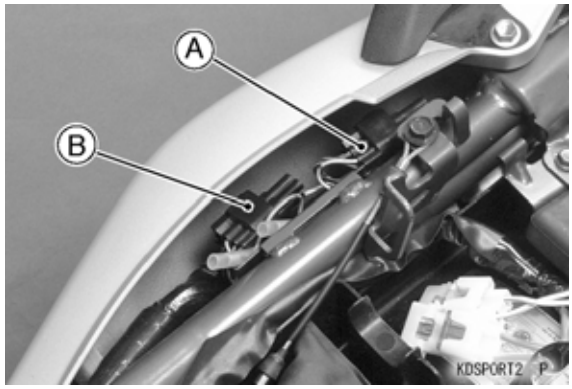


Fig. 7-4 ABS Port on ER650B

7.3.3 ZX1400B

- o Remove seat.
- o Remove the ABS Port [B] cover.
- o Connect the 8-pin connector on 57001-1649 to the ABS port.

A. Diagnostic Port for KDS (4-pin port)
B. Diagnostic Port for ABS (8-pin port)

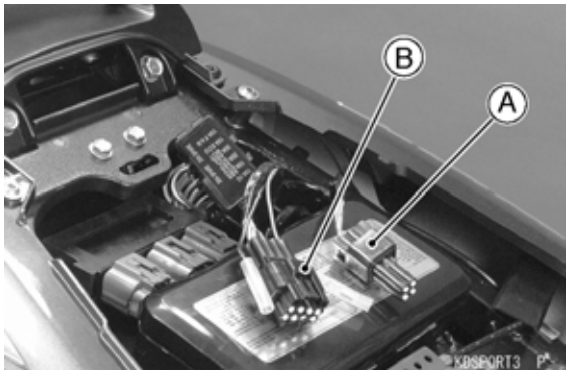


Fig. 7-5 ABS Port on ZX1400B

7.4 Menu Structure

The menu structure diagram is shown in Fig. 7-6.

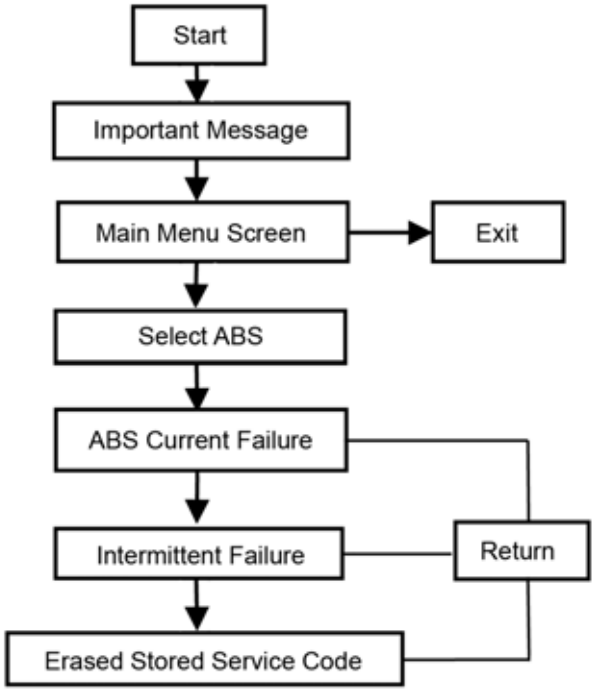


Fig. 7-6 ABS Structure

7.5 Operation

7.5.1 Starting KDS for ABS

- o Turn on the PC.
- o Start KDS Version 3 from the start menu. Or double-click the **KDS 3** icon on the desktop screen.
- o Go to Main Menu (Fig. 7-7).
- o Select **ABS**.

Fig. 7-7 Start Menu

- o Next the **ABS Current Failure** screen appears. (Fig. 7-8.)
  - ~ *If there are no failures, the message* **No service codes exist** *appears.*

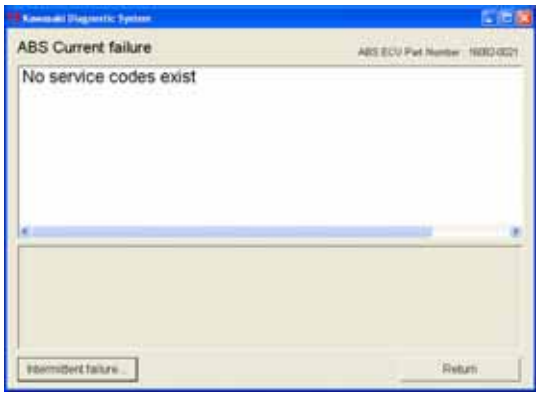


Fig. 7-8 Current Failure – No Code

- o If a failure exists, it will be listed (Fig. 7-9).

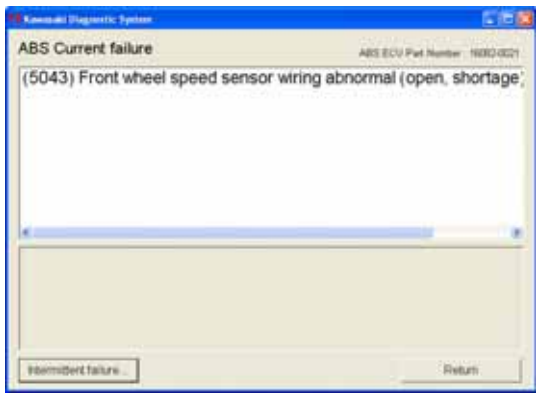


Fig.7-9 Current Failure - Code

o After repairing the failure, restart KDS-ABS.

Fig. 7-10 will appear.

o Confirm **No service codes exist**, then select **Intermittent failure** to see if there are any codes.

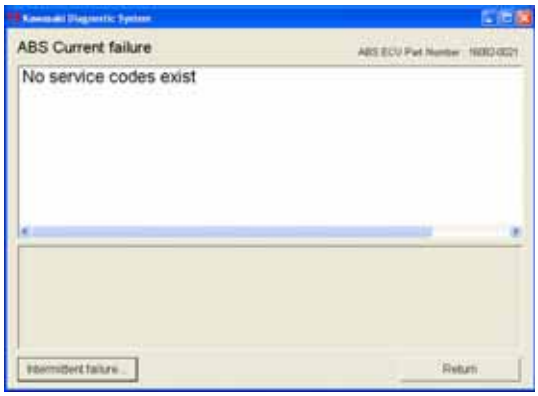


Fig. 7-10 Current Failure

The ABS Intermittent failure screen will appear (Fig. 7-11).

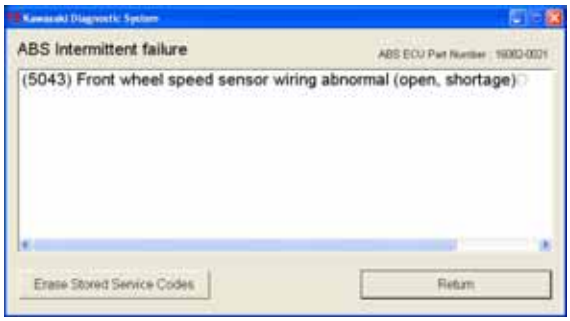


Fig. 7-11 Intermittent Failure

o To erase the intermittent failure codes, select **Erase Stored Service Codes** (Fig. 7-11).

o Select **Yes**, then select **OK** (Fig. 7-12).

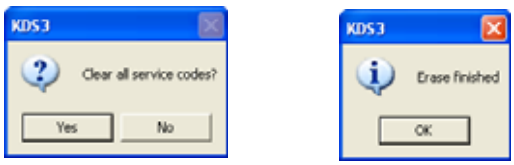


Fig. 7-12 Erase procedures

o Confirmation the ABS Intermittent failure has been erased is shown on screen (Fig. 7-13).

After confirming, select **Return** to finish.

Fig. 7-13 Erase Confirming

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