



Break Out Box Pro

OPERATION MANUAL



FOREWORD

This manual describes the operation of the Kia Break Out Box Pro (BOB Pro). Please read the entire contents of this manual and familiarize yourself with the BOB Pro hardware before beginning any diagnostic test procedure.

The BOB Pro is designed to increase diagnostic capabilities by providing access to voltage/frequency measurement of multiple ECU terminals.

The BOB Pro is designed for trained service personnel to diagnose and repair automotive electronic systems.

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Every attempt has been made to provide complete and accurate technical information based on factory service information available at the time of publication. However , the right is reserved to make changes at any time without notice.

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CONVENTIONS

This manual uses the following conventions to alert you to information that will help you operate the BOB Pro correctly and safely ;

CAUTION

This indicates the conditions which may result in damage to the vehicle's equipment or BOB Pro if the caution is not heeded. Follow the advice provided with the caution.

NOTE

This Indicates that interesting or helpful information is being provided.

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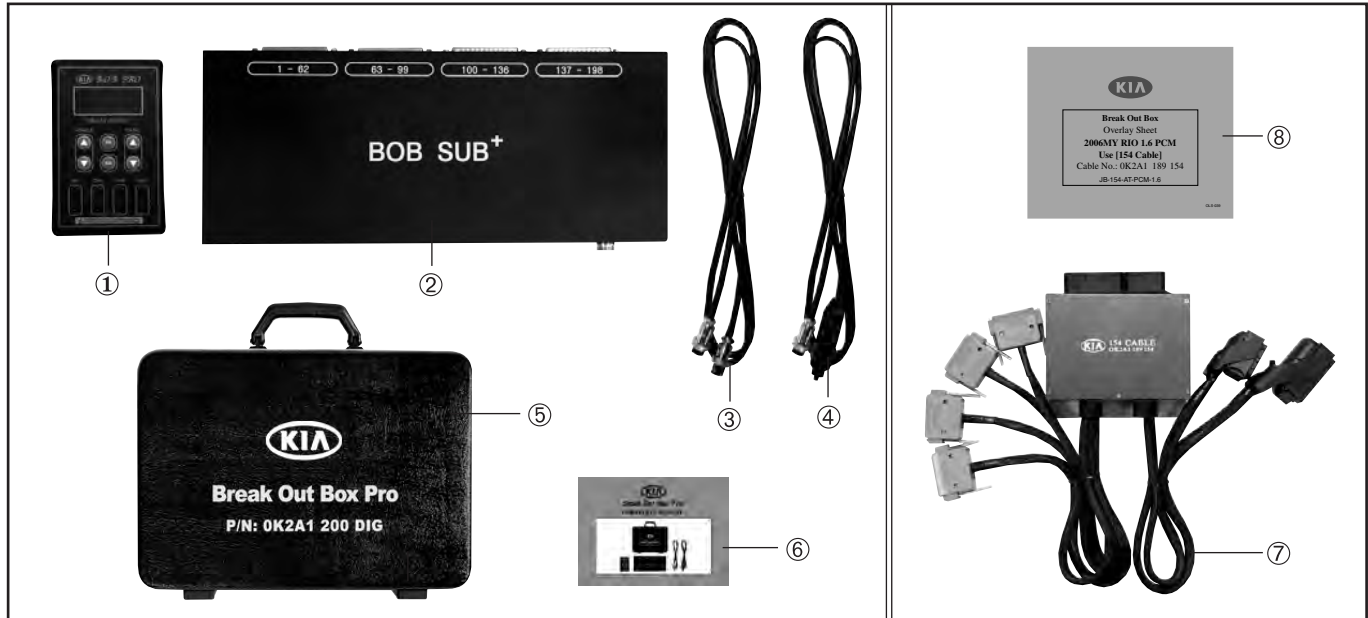
1. General Information

The BOB Pro offers quick diagnosis and troubleshooting on ECU.

This tester provides measurements (Voltage and Frequency) of ECU signals to assist in the detection of failed components. The BOB Pro also provides access points for external test equipment such as an oscilloscope.

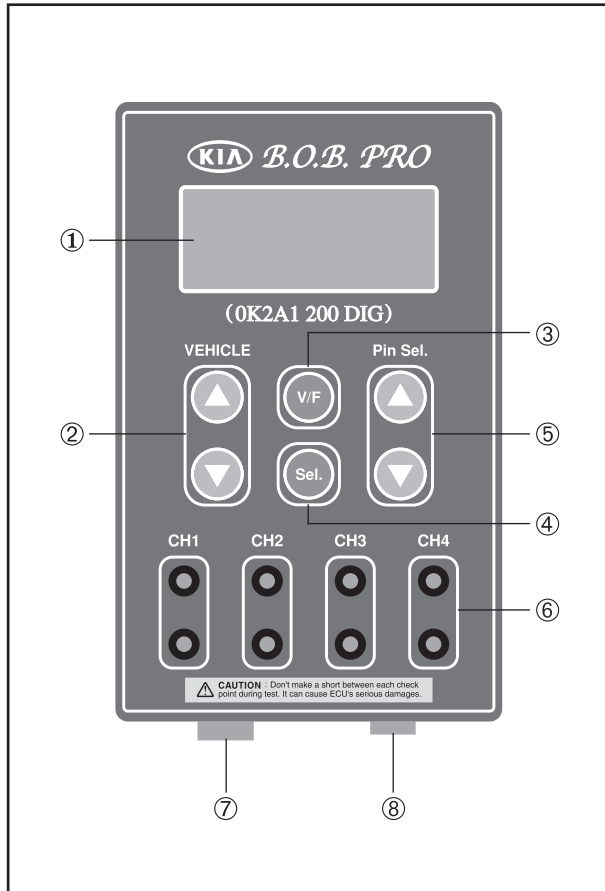
It was designed to improve customer satisfaction through rapid repair of vehicle electrical malfunctions.

1) Components



General Information

S/N	Items	Part No.	Part Name	Q'ty (EA)	Remark
	BOB Pro Ass'y	0K2A1 200 DIG	BOB Pro		BOB Body & Sub Plus + Power & Main Cable + Storage Case + Operation Manual
①	BOB Pro	0K2A1 200 BOY	BOB Body	1	Tester
②		0K2A1 200 SUBP	BOB Sub Plus	1	Connection between BOB Body & Interface Cable
③		0K2A1 200 MAN	Main Cable	1	Connection between BOB Body & BOB Sub Plus
④		0K2A1 200 PWR	Power Cable	1	Power Supply
⑤		0K2A1 200 BAG	Storage Case	1	Case
⑥		0K2A1 201 MNL	Operation Manual	1	
⑦	Interface Cable	-	-	-	ECU Interface Cable (Option)
⑧	Overlay Sheet	-	-	-	BOB Overlay Sheet (Option)



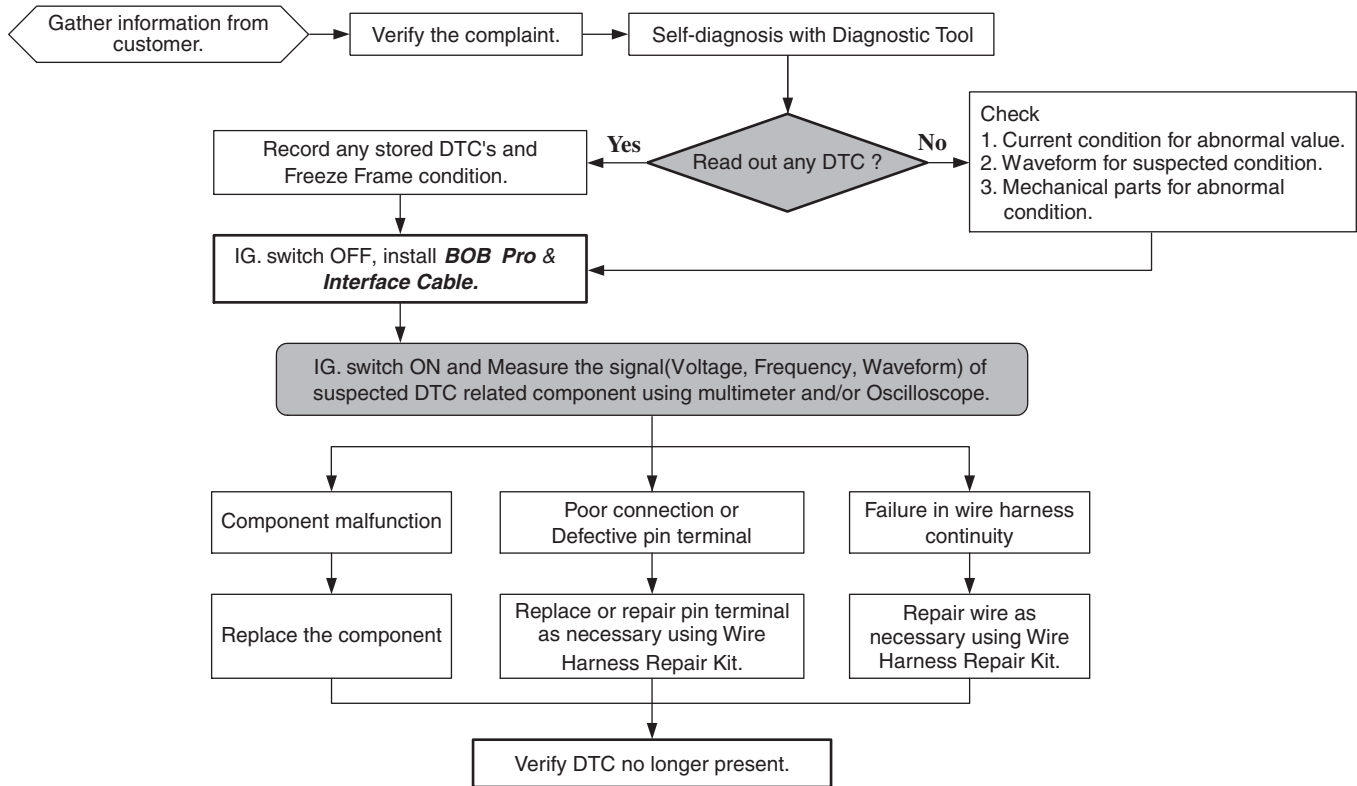
2) Tester Panel Configuration (BOB Body)

- ① - Display Window
- ② - Vehicle Up/Down Button
- ③ - Voltage/Frequency Button
- ④ - Selection Button (Set up the vehicle, select channel 1~4)
- ⑤ - Pin Selection Up/Down Button
- ⑥ - Voltage/Waveform Check Point (Channel 1~4)
- ⑦ - Main Cable Port
- ⑧ - Power Cable Port

3) Function

- a. Update for new vehicles.
- b. Measure the signal(Voltage/Frequency) at each Pin.
- c. Measure the waveform through Voltage/Waveform Check Point(Channel 1~4).
- d. Compare 4 signals(CH1-4) at once.

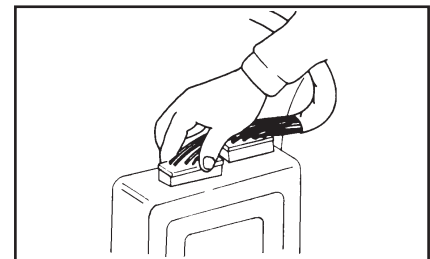
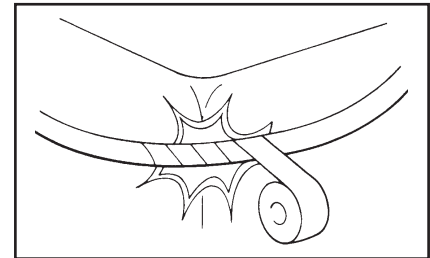
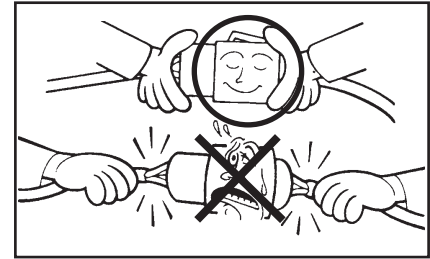
2. Troubleshooting Guide With BOB Pro



3. Installation

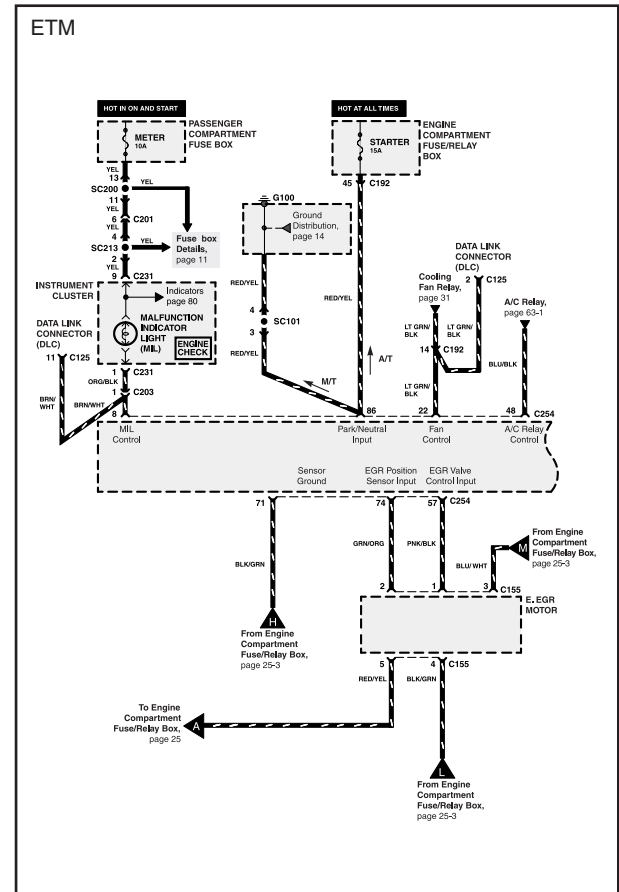
1) Notes

- a. When disconnecting a connector and Interface Cable, be sure to pull only the connector, not the harness.
- b. Check the pin condition of the connectors when installing or disconnecting the Interface Cable from the ECU or wiring harness.
- c. Be careful not to damage any of the wiring harnesses.
- d. If any section of a wiring harness is in contact with a sharp edge, wrap the harness with electrical tape or reposition and secure the harness to protect it from damage.
- e. Never impact the BOB Pro, Interface Cable or expose them to liquids. Be sure to use them under specified environment.
- f. Check wire installation and coating for damage, cracks and degrading.
- g. Loose connectors could cause system and/or component malfunctions. Make sure that the connectors are properly secured.



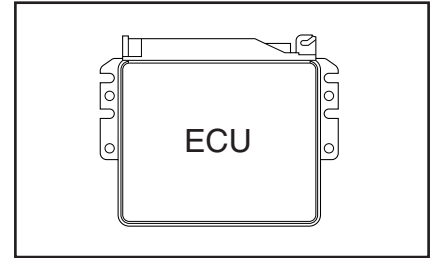
2) Preparation

- a. Check the Vehicle Model, Model Year.
- b. Choose the correct Interface Cable and Overlay sheet.
- c. Prior to disconnecting the ECU connector, be sure to turn off the ignition switch.
- d. Before installation of BOB Pro, check the condition of all BOB Pro components. Do not install BOB Pro if components or cables are damaged.
- e. Prepare the multimeter and/or oscilloscope if necessary.
- f. Locate the schematic diagram in the applicable Electrical Troubleshooting Manual (ETM).



3) Installation Procedure

- a. Turn the Ignition switch to the “OFF” Position.
- b. Locate the vehicle ECU harness connector.
Refer to the applicable ETM if you are not sure where the connector is located on the vehicle.



- c. Disconnect the ECU connector.

⚠ CAUTION

Print out or write down any stored DTC's and Freeze Frame data before you disconnect the ECU connector. All stored data will be lost when the ECU electrical connectors are disconnected.



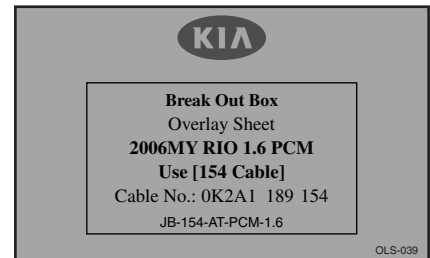
- d. Select the correct interface cable and Overlay Sheet.

ex) Interface Cable : 154 CABLE

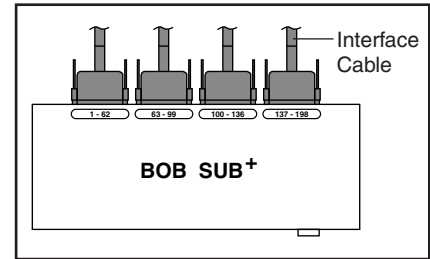
Overlay Sheet : JB-154-AT-PCM-1.6

◆ NOTE

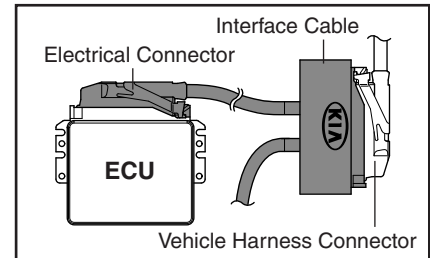
The correct interface cable is also indicated on the applicable Overlay Sheet.



e. Connect the interface cable to the BOB Sub Plus.



f. Connect the vehicle harness ECU connector to the interface cable, and/or connect the interface cable electrical connector to the vehicle ECU.



g. Connect the Main Cable(0K2A1 200 MAN) to the BOB Body (0K2A1 200 BOY) & BOB Sub Plus (0K2A1 200 SUBP).

h. Connect the Power Cable (0K2A1 200 PWR) to the BOB Body and cigarette lighter socket.

◆ **NOTE**

Use a suitable adapter (not included) if the BOB Pro is being connected directly to the vehicle battery.

⚠ **CAUTION**

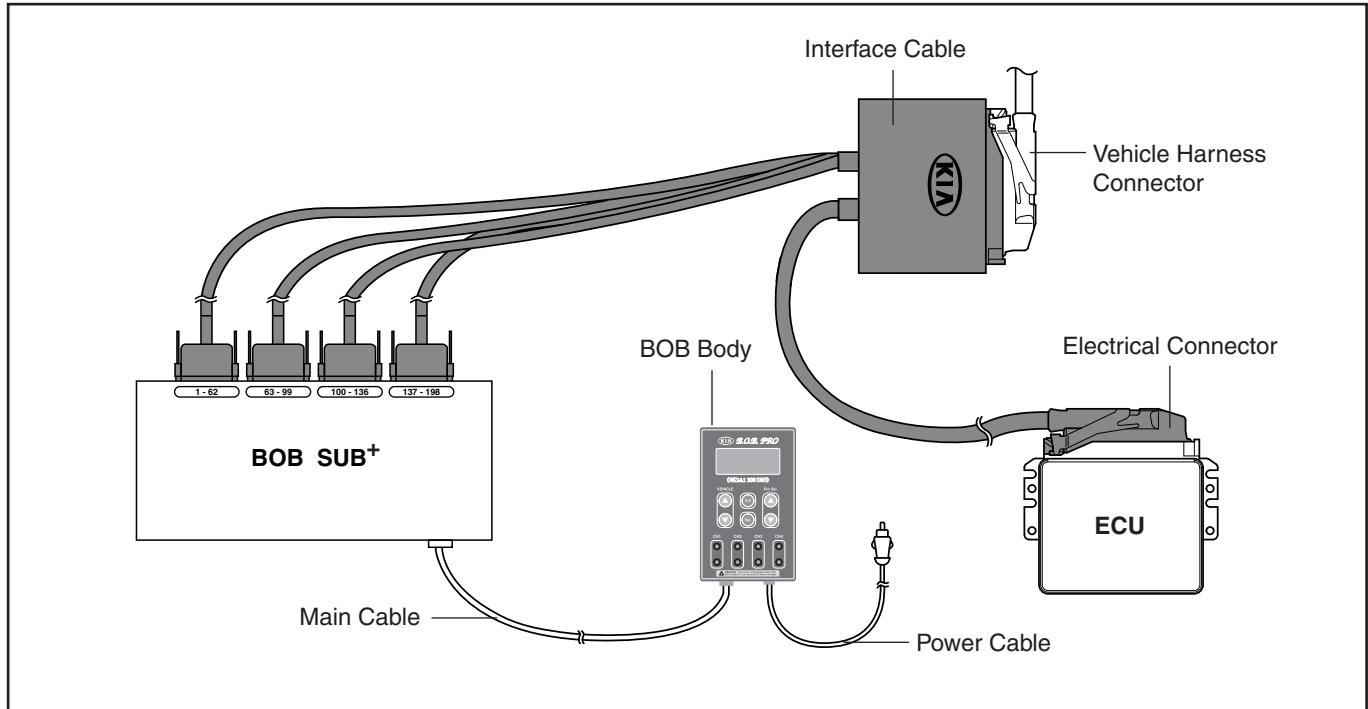
To prevent open circuit of fuse(1A) in the cigar jack plug, you are required to connect power cable to the BOB Body, then connect to cigarette lighter socket.



4. Test Procedure

Measure the signal(Voltage, Frequency, Waveform) between the ECU and the sensor and identify which part(s) is malfunctioning.

a. Verify that Interface Cable and BOB Pro were connected as follows ;



b. Turn the Ignition switch to the “ON” position.

c. Verify that “WELCOME TO ~” is first displayed, and then the value of voltage or frequency is displayed.

◆ **NOTE**

If the value of voltage or frequency is not displayed, test again after checking the connection condition of the Main Cable.

d. Press “Vehicle Up/Down Button” more than 1second, and the tester will switch to vehicle selection mode.

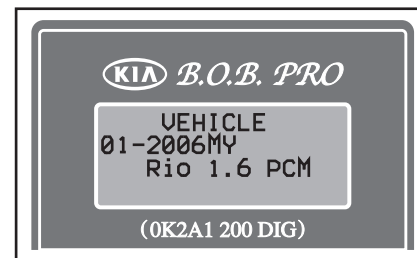
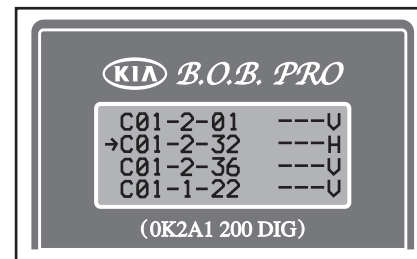
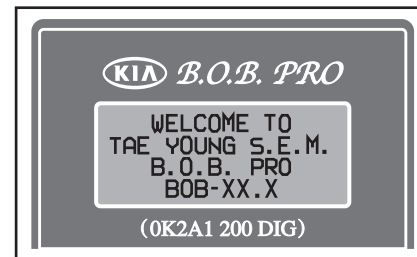
e. Use the “Vehicle Up/Down Button” to configure the tester for the appropriate vehicle.
After selecting the correct vehicle, press the “ Selection Button” to confirm the selection.

⚠ **CAUTION**

The Tester may be damaged and will not function properly if it is placed in the wrong Vehicle Selection Mode.

◆ **NOTE**

Additional vehicles will be added via future CPU upgrades.



f. Press the Selection Button to select the desired channel.

◆ **NOTE**

Whenever “Selection Button” is pushed, the indication of an arrow(→) is rotated.

g. After selecting the Channel, Press the “Pin Selection Up/Down Button” to check the desired signal (Refer to the Overlay Sheet).

h. If you want to change measurement signal (Voltage or Frequency), Press “Voltage/Frequency Button”

i. If you want to verify the signal(waveform) of channel(1-4), Connect the oscilloscope to appropriate “Voltage/Waveform Check Point”. (You can check voltage with multimeter at the Voltage/Waveform Check Point if necessary.)

⚠ **CAUTION**

Don’t make a short between each check point during test. It can cause damage to the ECU or to the BOB Pro.

◆ **NOTE**

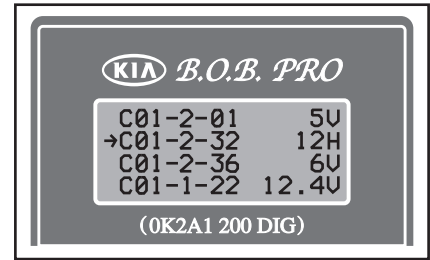
The first line on the display window is output of CH1, the second is CH2, the third is CH3 and the fourth is CH4.

j. Verify the signal as indicated in the pin location tables on the Overlay Sheet. (BOB pin identifiers signal(voltage/frequency) requirements are located on the Overlay Sheet.)

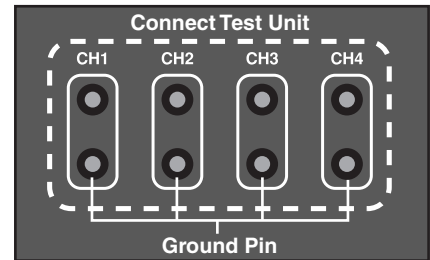
⚠ **CAUTION**

The ground cable on the test unit(multimeter) should be connected to the ground pin location on the BOB Pro.

k. If the value of signal on the display window is not within the specified range, locate and repair the cause of malfunction.



H - Frequency, V - Voltage



TERMINAL REFERENCE TABLE : 2006MY RIO 1.6 PCM					
CHANNEL	DESCRIPTION	CONDITION	TYPE	LEVEL	
CH01	Ignition Coil (Driver Side) Control Output	Idle	Pulse	10 Voltage: 120 ~ 400V DC Voltage: 16V-2V	
CH02	Ignition Coil (Passenger Side) Control Output	Idle	Pulse	10 Voltage: 120 ~ 400V DC Voltage: 16V-2V	
CH03	Fuel Inj. (Passenger Sensor) (PT25) Control Output	Idle	DC	2.4V ~ 4.2V	
CH04	SA Speed Control Actuator (SCA) (SPRN) Control Output	Idle	Pulse	H: 10V-15V L: 0V	
CH05	Fuel Inj. (Driver Sensor) (PT25) Control Output	LINE OFF Lamp ON	DC	10 Voltage: 10V 12V: 10V-12V 14V: 10V-12V	
CH06	Flap Control Solenoid Valve (PCV) Control Output	Idle Reverse	Pulse	10 Voltage: 12V DC Voltage: 16V-2V	
CH07	Water Pump Control Output	LINE OFF	DC	10 Voltage: 10V 12V: 10V-12V 14V: 10V-12V	
CH08	Ignition Switch Signal Input	IGN ON	DC	10V-12V	
CH09	Lock Signal	LOCK	DC	10V-12V	
CH10	Wiper Sensor (A) Signal Input	Wiper ON	Pulse	10V-12V	
CH11	Ignition Coil (Driver Side) Control Output	Idle	Pulse	10 Voltage: 120 ~ 400V DC Voltage: 16V-2V	
CH12	Ignition Coil (Passenger Side) Control Output	Idle	Pulse	10 Voltage: 120 ~ 400V DC Voltage: 16V-2V	
CH13	Headlight Lamp Control Output	LINE OFF Lamp ON	DC	10 Voltage: 10V 12V: 10V-12V 14V: 10V-12V	

5. Removal

After testing, remove the equipment as follows ;

- a. Turn the ignition switch to the “OFF” position.
- b. Disconnect the multimeter and/or oscilloscope.
- c. Disconnect the Power Cable from BOB Body and cigarette lighter socket.
- d. Disconnect the Main Cable from BOB Body and BOB Sub Plus.
- e. Disconnect the interface cable electrical connector from the Vehicle ECU.
- f. Disconnect the vehicle harness connector from interface cable connector from harness side.

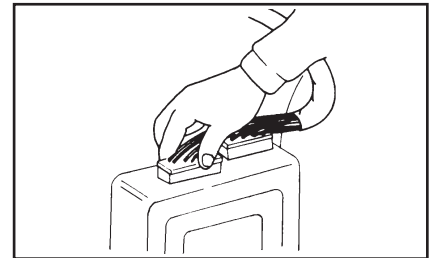
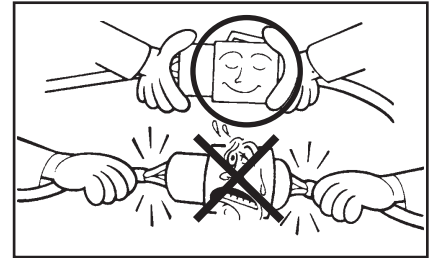
CAUTION

When disconnecting connectors and Cable Ass’y, never pull on the wiring harness.

- g. Disconnect the interface cable connector from the BOB Pro.
- h. Connect the vehicle harness connector to vehicle ECU.

CAUTION

**Loose connection could cause system and/or component malfunctions.
Make sure the connectors are connected securely.**

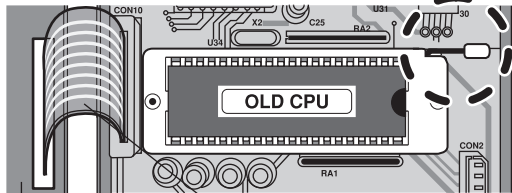


6. CPU Exchange

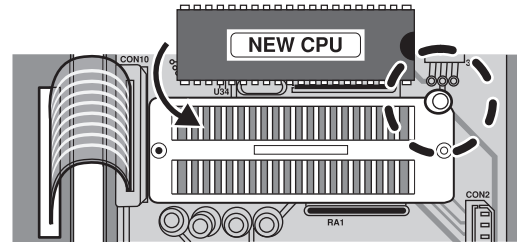
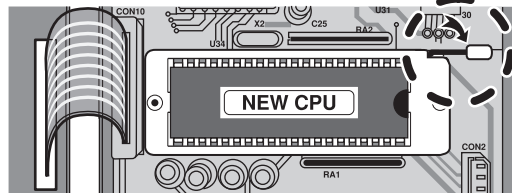
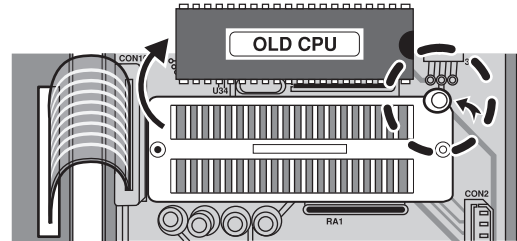
The tester can be updated to support new vehicles by changing the CPU.

- Procedure

- When open the case, be careful not to extract the key pad connection.



Body case Key pad connection



⚠ CAUTION



← Verify proper CPU insert direction.

Quality Assurance

Name of products : *Break Out Box Pro*

Model Number : 0K2A1 200 DIG

Date of Production : Jul. 01. 2006

We hereby certify that the above product is guaranteed by our Quality assurance policy and procedures listed under here.

Subject of Assurance : All components contained in the Break Out Box Pro as supplied to Kia Motors America and Dealers by TAEYOUNG S.E.M.

Parts Guarantee : Quality and Durability of each component

Guarantee Period : 2 Years from the date of purchase.

TAEYOUNG S.E.M. Co.,Ltd.

President : 



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