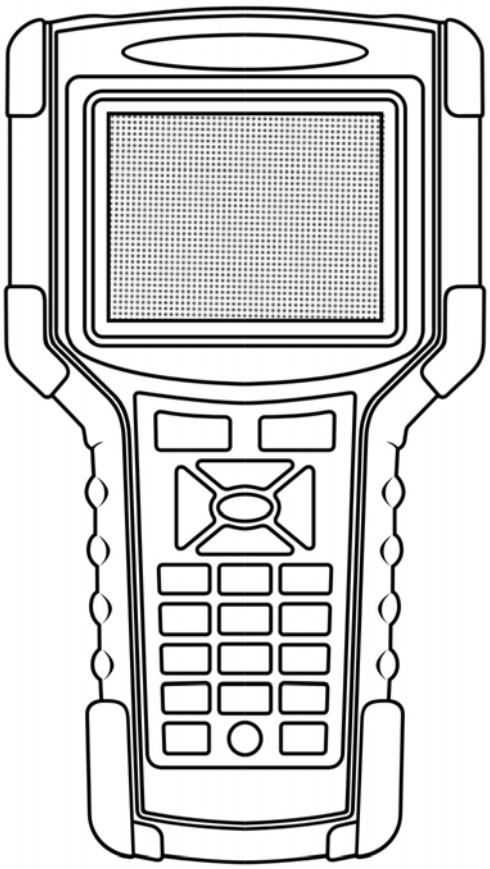
MULTISCAN P2

User's manual



Automotive Diagnostic Equipment Specialist

Hanatech Co.,Ltd.

Hanatech reserves the right to change, modify the content of this instruction manual for product enhancement both technical and non technical without notice.

This may include scan tool graphic displays, vehicle coverage, supported functions both technical, non technical and operating procedures. Hardware may also be modified, altered or redesigned or may differ from the descriptions and illustrations displayed in this manual

CHAPTER 1 SAFETY AND WARRANTY

Safety and Warranty

About this Manual

The contents of this manual are the result of contributions by dozens of individuals all who have added their vital expertise and experience to the evolution of the contents of this manual.

The information contained in this manual may contain printing errors and is subject to change without notice according to product upgrade. Hanatech shall not be liable for errors contained herein or for incidental or consequential damage in connection with the furnishing, performance, or use of this material.

Using this Manual

It is recommended that the user become familiar with the operating procedures, terminologies and information contained within this user's manual. This will help to increase the user's effectiveness with this equipment.

Vehicle system familiarity

While this equipment provides very powerful functions with extensive vehicle coverage, it cannot replace knowledge and skill. To get the most out of this equipment, a full understanding of vehicle systems is required. It is recommended that the equipment be used in conjunction with the original service manual for the vehicle being tested.

The equipment is designed for use by trained service personnel and this manual assumes that the service technician who is going to use this equipment has a familiarity with vehicle electronic control systems, however, the latest service manuals and bulletins should always be referenced before using this equipment.

I. SAFETY INSTRUCITONS ----------

Thank you for purchasing MULTISCAN P2. To get the maximum performance of the equipment, please carefully read this manual first, and keep it at hand.

On delivery inspection

When the equipment is delivered, a check should be made for any damaged or missing components. If the unit is damaged or fails to operate according to the specifications, contact your local distributor or the manufacturer, Hanatech Co., Ltd., Hana bldg., 1032-39 Wonpyeong-dong, Gumi-shi, Kyung-buk Republic of Korea 730-924. In the unlikely event the equipment requires shipping back to the manufacturer, please use the original packing material.

Safety symbols

The following symbols are used throughout this manual:

⚠ DANGER	This mark means that dangerous consequences may arise, with the possibility of death or serious injury to the user, if the machine is handled incorrectly.
⚠ WARNING	This mark means dangerous consequences may arise, with the possibility of somewhat serious injury to the user and or damage to the machine and facilities, if the equipment is handheld incorrectly.

SYMBOL	Description
	This symbol is affixed to locations on the equipment where the operator should consult corresponding topics in this manual (which are also marked with the ⚠ symbol) before using relevant functions of the equipment. In the manual, this symbol indicates explanations that are particularly important that the user is expected to read the manual before using the equipment.
	This symbol represents DC (Direct Current)

Safety guideline

In order to ensure proper operation and satisfactory performance, observe the cautions listed below.

⚠ DANGER
This equipment is designed to comply with IEC61010-1 safety standards, and has been tested for safety prior to shipment. Excessive high voltage measurement or improper operation could result in personal injury, as well as damage to the equipment or the vehicle. Please read this manual carefully and be sure that you understand its contents before using the equipment. The manufacturer disclaims all responsibility for any accident except for that resulting due to defect in its product.

⚠ WARNING	
	For safety reasons, this equipment should not be used to measure circuits carrying more than 30Vrms or 42.4V peak. To avoid electrical accident that could result in injury or death, do not measure voltage in excess of these limitations. Maximum rated measurable voltage is 30Vrms or 42.4V peak.

II. SAFETY PRECAUTIONS ----------

DANGER

When an engine is running, keep the workshop area WELL VENTILATED or attach a building exhaust removal system to the engine exhaust system. Engines produce carbon monoxide, an odorless and poisonous gas that causes slower reaction time and may lead to serious injury or death.

WARNING

Brakes and wheel blocks

Apply the hand brake and block the wheels before using the test equipment. It is highly recommended to block the wheels on front-wheel drive vehicles because the hand brake does not hold the driving wheels.

Drive Test

Do not drive the vehicle and operate the test equipment at the same time. Any distraction may cause an accident. Have one person operate the test equipment while the other person drives the vehicle.

Never place the test equipment in front of you when driving the vehicle because the test equipment may hit your body and cause serious injury when the air bag inflates.

Do not try to test the SRS air bag system while driving the vehicle as unintended air bag inflation may result.

Engine Compartment

Maintain sufficient clearance between moving components or belts while using the test equipment in the engine compartment. Moving components and belts may catch loose clothing, test cables or a part of your body and cause damage or personal injury.

Electrical Components

Always turn the ignition key OFF when connecting or disconnecting electrical components unless otherwise instructed.

Vehicle Battery

MULTISCAN P2 is designed to prevent damage from reverse polarity battery cable connection, however, it is always highly recommended to always ensure correct polarity terminal connection.

Never lay the test equipment on vehicle battery. You may short the terminals and may cause damage to your body, the test equipment or the battery.

To avoid damaging the test equipment or displaying false data, make sure the vehicle battery is fully charged and the connections to the electronic control module are clean and tight.

The warning messages above and the safety messages contained hereinafter cover situations Hanatech is aware of. Hanatech cannot know, evaluate or advise you as to all of the possible hazards. You must make sure that any conditions or service procedures encountered do not jeopardize your personal safety.

III. WARRANTY SERVICE ----------

Warranty Period

In principle, MULTISCAN P2 is warranted to the customer to be free of defects in material and workmanship for the period of 1 year and 3 years for main board after the date of registration.

When the product is found defective during this period, the product can be returned to Hanatech and will be repaired or replaced free of charge.

Freight and Repair Cost

During the warranty period, the repair cost and freight cost are covered by manufacturer. When the defective product or part needs to be sent to the manufacturer, it should be advised by the local distributor about how to send and the validity of remaining warranty period before sending the defective material.

Upon delivery

Hanatech inspects all the ordered product parts and components are included in the package before shipment, and include the original copy of pre-shipment inspection report in the box. As soon as the product is delivered to you, please ensure everything you ordered is properly checked and included referring to the pre-shipment inspection report. If there is anything missing or damaged, you must notify the local distributor immediately within 3 working days from the delivery date for free of charge replacement of the parts.

In case of trouble

If you encounter any malfunction or trouble with the equipment, please refer to the Trouble Shooting chapter in this manual. If the problem cannot be solved, please contact your local distributor for assistance. For early identification of a fault or error, your local distributor will require the following details:

1. Symptom of problem you are experiencing
2. Serial number of the head unit

3. Vehicle information: Which specific car were you testing when the problem occurred – Model name, Model year and system ID number if available (for Mitsubishi, Subaru and Suzuki only: Refer to Japanese car chapter for details)

Warranty Void

Even in the effective warranty period, if the problem is found to be caused by any of the followings, Hanatech charges the cost for round trip freight and actual cost for the service to the customer, and the shipment back to the customer will be suspended until the customer's payment is duly made

1. Evidence of improper use or application of the product ignoring the cautions and warnings stipulated in the user's manual

2. Intentional damages or modifications to the product or user's attempt to repair without proper authorization

3. Any damage caused by Force Majeure including war and natural disaster

4. Loss of time, inconvenience and other consequential damage or loss

Warranty void seal

In addition to the above mentioned warranty void conditions, warranty service is not provided in case the warranty void seal is broken or removed.

If you remove the head unit safety boot, you will see a yellow round sticker covering one of the screw holes in the back. Please be careful not to break this seal and never try to open the head unit without direct authorization from the manufacturer.

Bought in other countries

Only the products properly supplied by the contracted authorized local distributors are recognizable for free of charge warranty service. Any equipment bought outside the contracted national territory of your local distributor will be charged for service.

FCC RF INTERFERENCE STATEMENT

Note

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules.

These limits are designed to provide reasonable protection against harmful interference in a residential installation.

The equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation.

If this equipment does not cause harmful interference to radio or television reception which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures;

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

Caution

Changes or modification not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

THIS DEVICE COMPLIES WITH PART 15 OF THE FCC RULES. OPERATION IS SUBJECT TO THE FOLLOWING TWO CONDITIONS; (1) THIS DEVICE MAY NOT CAUSE HARMFUL INTERFERENCE. AND (2) THIS DEVICE MUST ACCEPT ANY INTERFERENCE RECEIVED INCLUDING INTERFERENCE THAT MAY CAUSE UNDESIRED OPERATION.

CHAPTER 2 SPECIFICATION AND PARTS

Specification and Parts

I. Specification ----------

A. Hardware

CPU: 16bit, 33MHz

RAM: 1 M byte (SRAM)

Program Cartridge Memory: 512MBytes Flash Memory

Display: 320×240 Monochrome Graphic LCD with Back Light

Key Pad: 20 membrane keys, embossing type

Communication Port: USB and RS232

Printer: General PC printer

Power: DC 12V, 700mA

SUPER CAP (2.7V / 10F SERIAL 5EA)

- Maintain the system without power for about 10 seconds when fully charged

B. Environmental Specification

Indoor use only

Operating temperature: Max 50℃ / 122°F

Maximum relative humidity: 80% (up to 31℃/88°F) and 50% (40℃/104°F or higher)

Installation overvoltage categories: CAT Ⅱ

Maximum measurable voltage: DC 30V Max

Pollution degree 2

Max. Altitude: Up to 2000m

C. Mechanical Dimensions

Length: 222㎜ / 9"

Width: 187㎜ / 7.5"

Height: 51㎜ / 2"

Weight: 950g / 2.1lb (head unit only)

Body Color: Dark Grey

Safety Boot Color: Blue

All specifications are subject to change without notice for the purpose of product and quality improvement.

II. Part List ----------

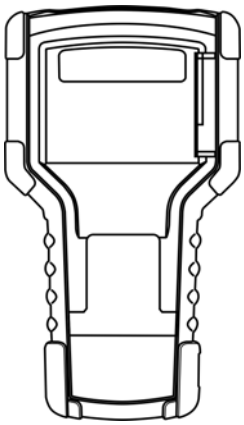
A. Head unit and basic supplies

1. Head Unit (P/N. 1000-0007)

1) Made of strong ABS resin, each unit has passed internal impact test before shipment.
2) As the inner surface is coated with anti-electromagnetic interference material, it neither interferes the other electronic devices nor gets interfered by the other equipments.

2. Safety Boot (P/N. 2003-0032)

1) Flexible plastic cover that protects the head unit from physical, chemical and electrical damage
2) Basic color is blue, however, it can be changed according to the distributor's demand.



3. Carry Case (P/N. 3003-0003)

Provides convenient transportation and the protection of the head unit and other components from outer physical impact during the transportation and storage. Carry case is provided when purchasing the head unit and at least one software package together. Includes keys and dial lock

4. Main Data Link Cable (P/N. 3001-0001)

- Connects vehicle side DLC and MULTISCAN P2 head unit for data transmission.
- Connecting parts on both ends are exactly same, therefore, simply put any one end to the head unit, and then hook the other end to the vehicle side DLC after connecting an appropriate adaptor

5. Power Cable 1 – Cigarette Lighter (P/N. 3000-0004)

- Supplies power to the head unit from the cigarette lighter socket. Used when DLC is located near the driver or passenger seat and power is not supplied through DLC.
- LED lights on both ends turn ON when power is properly supplied.
- The metal plunger part in the end of cigarette lighter connector is

removable by unscrewing for the fuse replacement. It may become loose over repeated use, therefore, it is highly recommended to check if it is tightly screwed frequently. A set of plunger parts are included in the basic supplies. Refer to spare parts section hereinafter.

- The rated voltage and current for this power cable are 12V and less than 2A.

6. Power cable 2 – Vehicle Battery (P/N. 3000-0005)

- Supplies power from the vehicle battery when the DLC is located in the engine bay or when using the oscilloscope or multi-meter functions
- Connect each of the two alligator clips to the battery terminal of the correct polarity with caution.

- Must be used together with the Power Cable 1. Insert the cigarette lighter adaptor of the Power Cable 1 into the socket, and connect the other end to the head unit.
- Red LED light turns ON when power is properly supplied from the vehicle battery.

B. Diagnostic Adapters

Diagnostic adapters may be sold separately, therefore check if all the adapters you ordered are included in the package upon delivery.

There are two types of adapters: capsulated and wired types.

Most of MULTISCAN P2 adapters are capsulated for better durability and storage, however, sometimes it is difficult or almost impossible to connect the capsulated adapter to vehicle side DLC when it is located deep inside beneath the dashboard. We use wire type adapters for the cars such as Hyundai and Kia that we were reported to have such connecting difficulties.

Capsule type	Wire type
	

1. OBD2 Standard Adapter

(P/N. 3001-0010)

Used for all OBD generation 2 and EOBD compatible vehicles. Vehicle side DLC is generally located near the driver's seat and most frequently found beneath the dash panel.

2. Toyota / Lexus 17Pin Rectangular Adapter (P/N. 3001-0011)

Used for the diagnosis of Toyota and Lexus of OBD generation 1. Vehicle side DLC of this type is generally located in the engine compartment.

3. Toyota/Lexus 17Pin Semi-circular Adapter (P/N. 3001-0012)

Also used for the diagnosis of Toyota and Lexus of OBD generation 1.

The vehicle side DLC is generally found beneath the dashboard.

Refer to the following warning message.

WARNING

The appearances of this adapter and **MAZDA 17Pin adapter** are exactly same, however, the internal wiring and circuit are different. Check the **engraved name** and the **body color** of the adapter carefully before use. **Improper adapter connection may result in serious malfunction of either control system and MULTISCAN P2 head unit.**

4. Honda 3 Pin Adapter and 2 Pin Jump Wire

(P/N. 3-pin: 3001-0014, 2-pin wire: 3001-0023)

3-pin adapter is used for the diagnosis of Honda cars of OBD generation 1 that support DTC read and erase as well as data stream.

Older Honda cars have 2-pin DLC that supports DTC read only. The jump wire is used for these older cars to bridge the 2-pin DLC terminals.

The vehicle side DLC is generally located under the dashboard or the glove box.

5. Mitsubishi and Hyundai 12Pin Adapter (P/N. 3001-0001)

Used for the communication with Mitsubishi and Hyundai cars of OBD generation 1.

A wire type adapter is provided as the connecting difficulties of capsule type adapter in quite a few Hyundai cars were reported.

6. Mitsubishi 12+16pin dual headed adapter (P/N: 3001-0030)

Used for the communication with Mitsubishi cars with both of 12-pin OBD1 and 16-pin OBD2 adapters on-board.

Refer to the Mitsubishi section, Chapter 6 for details.

7. Nissan and Samsung 14Pin Adapter (P/N. 3001-0006)

Used for the communication with Nissan cars of OBD generation 1 and all Samsung passenger cars.

Vehicle side DLC is generally found under the dash or inside the fuse box.

8. Mazda 17Pin Adapter (P/N. 3001-0013)

Used for the communication with Mazda cars of OBD generation 1.

Vehicle side DLC is generally located in the engine compartment.

Refer to the warning message in the next page:

WARNING

The appearances of this adapter and **Toyota 17Pin SEMI-CIRCULAR adapter** are exactly same, however, the internal wiring and circuit are different. Check the **engraved name** and the **body color** of the adapter carefully before use. **Improper adapter connection may result in serious malfunction of either control system and MULTISCAN P2 head unit**

9. Subaru 9Pin Adapter (P/N. 3001-0022)

Used for the communication with Subaru cars of OBD generation 1.

The vehicle side DLC is generally located beneath the dashboard.

10. GM Daewoo 12Pin Adapter

(P/N. 3001-1002)

Used for the communication with Daewoo cars of OBD generation 1.

The vehicle side DLC is generally located beneath the glove box, door side.

11. Kia 6Pin Adapter (P/N. 3001-0003)

Used for the communication with old Kia cars of OBD generation 1. Only the Diagnostic Trouble Code reading function is available for the cars with this type of adapter as only the slow pulse signal is transmitted through the vehicle side DLC.

The split wire of the adapter is to be connected to the ground terminal of the vehicle side DLC.

12. Kia 20Pin Adapter (P/N. 3001-0004)

Used for the communication with Kia cars of OBD generation 1.

DTC read & erase and data stream functions are available for the cars with this type of adapter.

Refer to the following warning message.

WARNING

The appearances of **Kia 20Pin adapter** and **Ssangyong 20Pin Rectangular adapter** are exactly same, however, the internal wiring and circuit are different. Check the **engraved name** and the **body color** of the adapter carefully before use. **Improper adapter connection may result in serious malfunction of either control system and MULTISCAN P2 head unit**

13. Ssangyong 20Pin Rectangular Adapter (P/N. 3001-0005)

Used for Ssangyong cars of OBD generation 1.

Vehicle side DLC is located in the engine compartment.

Refer to the warning above.

14. Ssangyong 14Pin Circular Adapter (P/N. 3001-0007)

Used for old Ssangyong cars of OBD generation 1.

Vehicle side DLC is located in the engine compartment.

15. Holden 6 Pin Adapter (P/N. 3001-0023)

Used for Australian Holden of OBD generation 1.

Japanese cars such as Toyota and Nissan assembled in Australia with Holden built engines may have this type of adapter, too.

Vehicle side DLC is generally located beneath the glove box to the center facia.

16. GM Opel 10Pin Adapter (P/N. 3001-0019)

Used for the communication with Opel cars of OBD generation 1.

Also available with MULTISCAN P2 Australian Holden, South American Opel and European Vauxhall software packages.

Vehicle side DLC is generally located in the fuse box beneath the dashboard or near the parking brake.

17. Ford 20 Pin Adapter (P/N. 3001-0020)

Used for the communication with Ford cars of OBD generation 1, including Australian and British Fords.

Vehicle side DLC is generally located in the fuse box beneath the dashboard.

18. Ford EEC-IV (P/N. 3001-0017)

Used for the communication with Australian Ford cars of OBD generation 1, Vehicle side DLC is generally located in the engine compartment.

19. BMW 20Pin Adapter (P/N. 3001-0016)

Used for the communication with BMW cars.

Vehicle side DLC is generally located beneath the dashboard or in the engine compartment.

20. VAG 2X2Pin Adapter (P/N. 3001-0029)

Used for the communication with Volkswagen/Audi Group cars,

Vehicle side DLC is located in various place on the vehicle but generally around dashboard.

Applied with SEAT, SKODA with this adapter also.

21. Mercedes Benz 38Pin Adapter (P/N. 3001-0015)

Used for the communication with Mercedes Benz cars equipped with 38Pin vehicle side DLC.

Applied with C202, CLK208, E210, E124, S140, SL129, SLK170, G463, G461.

22. Mercedes Benz 4Pin Adapter (P/N. 3001-0009)

Used for the communication with Mercedes Benz cars equipped with 8Pole or 16Pole vehicle side DLC.

(Red: Battery +, Gray: K Line,, Yellow : Ignition check, Black: Ground)

Applied with C201, E124, S126, SL107, G463

23. Upgrade cable (P/N. 3000-0010)

To be connected to main data link cable for updating your MULTISCAN P2 software by downloading updated codes from your PC. Refer to the related chapter in this manual.

24. Internal ULTRAPLEXER (P/N. 3001-0032)

Chrysler 12+16Pin cable 15Pin D Sub (to Main Cable => Scanner) to 12+16Pin adaptor (to Sebring/Stratus vehicle side adaptor)

25. Fiat 3Pin (P/N. 3001-0031)

Used for the communication with the OBD1 generation cars of Fiat Group. Vehicles side DLC is located in various place on the vehicle but generally around dashboard.

(Can be supplied as an optional part)

26. DC POWER CABLE (P/N. 3001-)

C. Software Cartridge

1) Contains vehicle information and operating software for ULTRASCAN P1 scanners.
2) The appearance and measurements for ULTRASCAN P1 cartridges complies with standard PCMCIA, however, inner circuits are of Hanatech's own design. Therefore, you can neither use it with the other equipment nor copy its contents to the other standard PCMCIA.

WARNING

MAKE SURE TO TURN POWER OFF BEFORE REMOVING OR INSERTING A CARTRIDGE. It is extremely dangerous to insert or remove a PCMCIA card while the head unit is turned on. Both PCMCIA card and head unit can be critically damaged and broken down. Always turn power off by pressing the [POWER] key or removing power supply cable from the head unit before inserting or removing a PCMCIA card..

D. Spare Parts

1) Extra fuses (P/N. 3008-0003)

For the replacement of the fuse located inside the cigarette lighter power cable. You can also replace it with a fuse of which rated current is 2 Ampere or less.

2) Spare cigarette lighter power cable plunger parts

A set of spare parts for replacement when the original parts are lost.

- Host-Pro PC Interface software CD.

Consisted of a software installation CD (P/N. 3005-0002), 5 meter USB cable (P/N. 3000-0014).

Enables realtime PC interface of MULTISCAN P2 scanners. Refer to the PC interface section of this manual and the separate HOST-PRO user manual for further information.

* Host Pro PC Interface software CD will be released later as of the date Feb 15. USB cable is generally easy to get and Kit may not include it without any notice

E. Optional Supplies

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1. THERMAL PRINTER

1) A **thermal printer** (or **direct thermal printer**) produces a printed image by selectively heating coated thermochromic paper.

2) Two types of Thermal Printer (Size difference)

1) PORTI-SW40/45 (3'' MOBILE PRINTER)

FEATURES

- Pocket size (107.5 x 88.5 x 45mm)
- High speed (60mm/sec)
- 203 dpi : 8 dots/mm
- UART or TTL, IrDA Ver1.0(SIR) or Bluetootn Ver2.0 interface
- Support text and graphic printing.
- Support bit-image(logo) download.
- Easier paper roll loading by CLAMSHELL design.
- Easier maintenance with self-diagnostic.
- Free fall: 1 meter onto concrete (option 1.5 meter)
- Microsoft Windows XP / 2000 / VISTA OS

2) PORTI-SC30 (2'' MOBILE PRINTER)

FEATURES

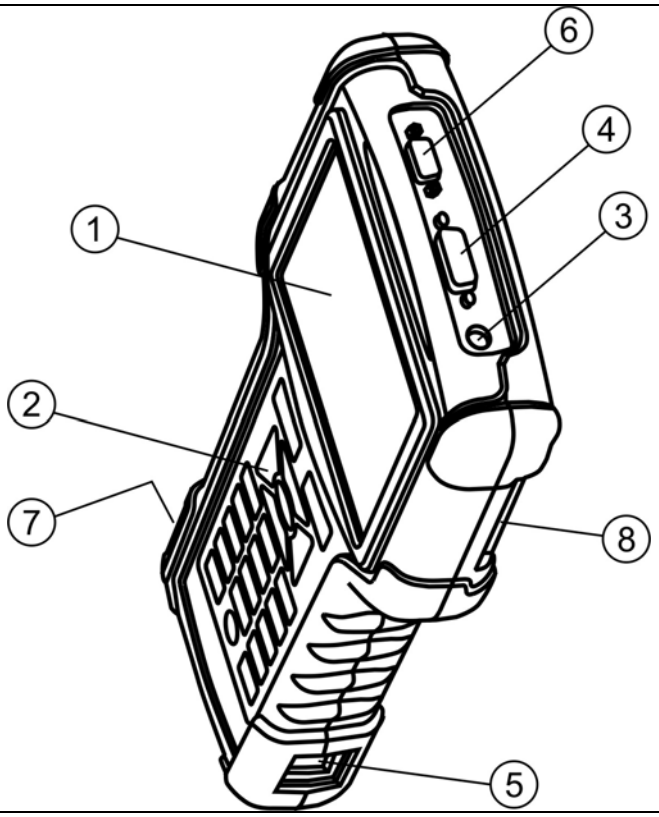
- Pocket size (75.5 x 112 x 34mm)
- Light weight(224g) for true mobility
- Very silent printing thru direct thermal printing method
- High speed (80mm/sec, MAX)
- High resolution (203dpi:8dots/mm)
- UART or TTL, Bluetooth Ver2.0 interface
- IrDA Ver1.0(SIR)(optional), USB(optional) interface
- Support text and grahpic printing
- MSR : ISO/IEC 7810, ISO/IEC 7811 (1/2 Track or 2/3 Track)
- Support bit-image(logo) download
- Easier paper rollloading by CLAMSHELL design
- Easier maintenance with self-diagnostics
- Using Combined with CDMA phone or PDA
- Free fall: 1 meter onto concrete (option 1.5 meter)
- Microsoft Windows ME / XP / 2000 / VISTA OS compatible

CHAPTER 3 OPERATING MULTISCAN P2

Operating MULTISCAN P2

Getting Started----------

A. Head Unit



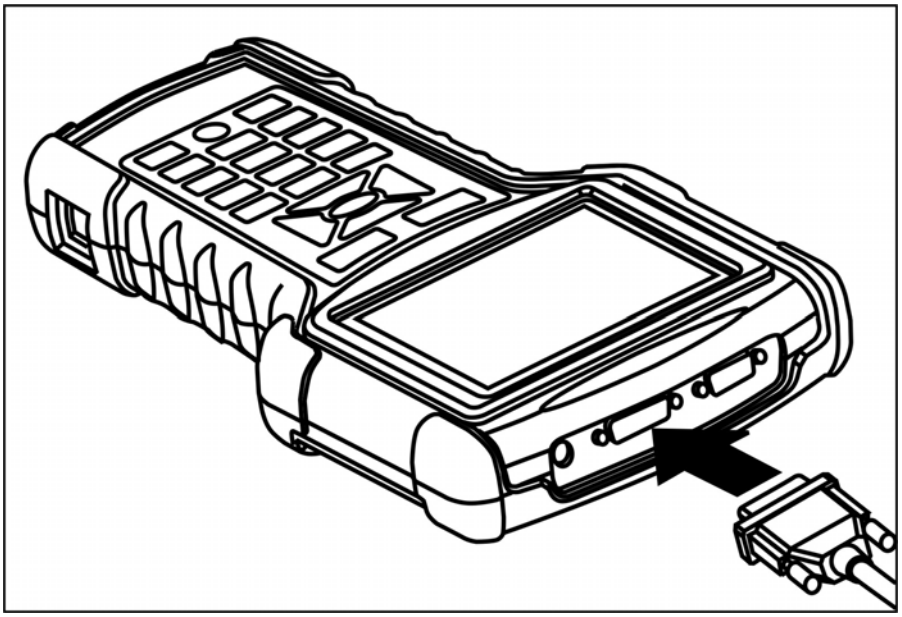
① LCD Display
② Key Pad (may be designed differently)
③ 12V Power Jack Connection
④ 15-pin Main DLC Cable Connection
⑤ USB port
⑥ RS232 Serial Communication Port
⑦ LCD Contrast Adjustment Dial
⑧ PCMCIA slot

B. Main DLC Cable

1. Connection to the head unit

a. The male connectors in both ends of the main DLC cable are exactly same and you can connect any of them to the head unit.

b. Press the main DLC cable connector into the head unit 15 pin female connector, and tighten up the two screws for firm connection.



2. Connecting the DLC adapters

Locate the vehicle side adapter and connect the corresponding DLC adapter to the remaining male connector of the main DLC cable

CAUTION

It is recommended to keep the main DLC cable connected and screwed to the head unit. Frequent connection and removal of the main DLC cable may loose the fastening parts and bend the connecting pins.

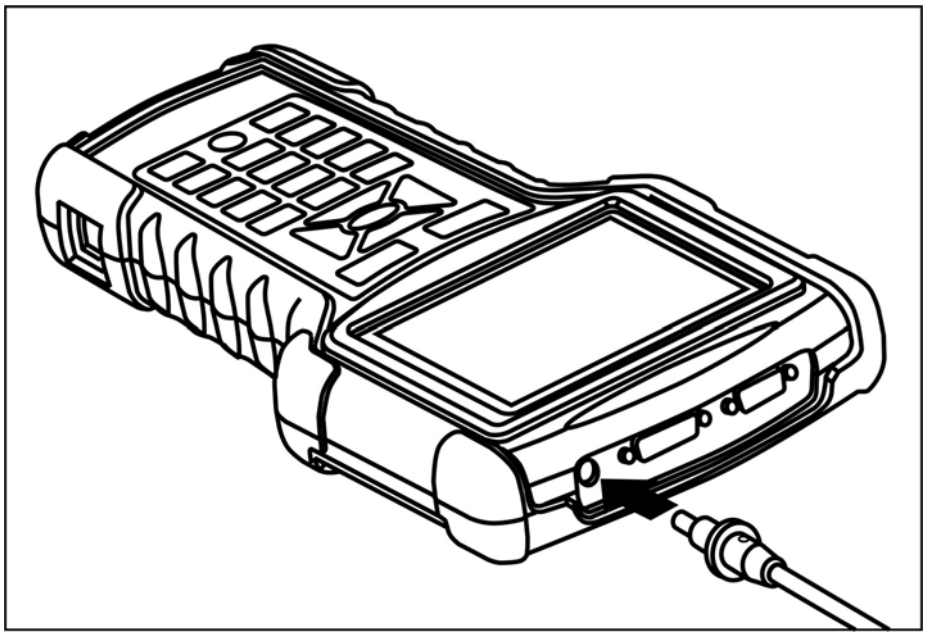
C. Power supply

1. Power supplied through DLC adapter

12V battery power is supplied through most of the DLC adapters except GM/Daewoo 10Pin and Mitsubishi/Hyundai 12Pin adapters

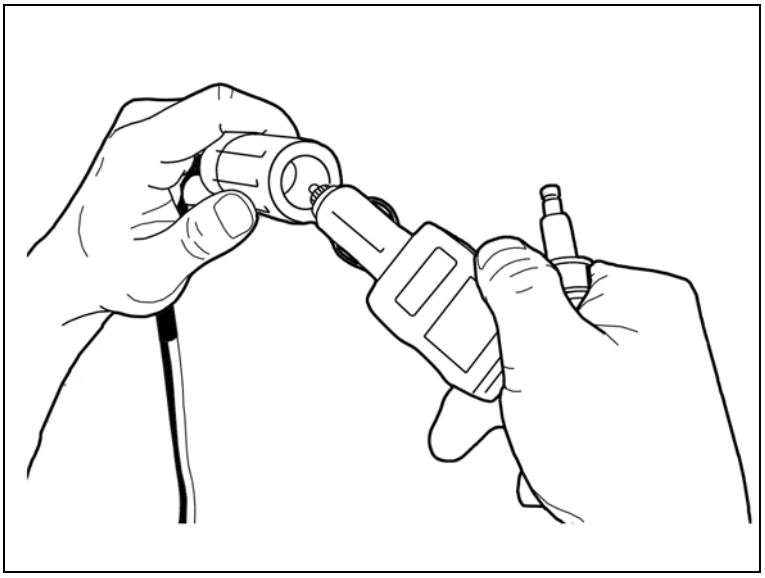
2. Cigarette lighter

a. Use the cigarette lighter cable when power is not supplied through the DLC adapter.
b. Insert the cigarette lighter connector into the socket, and check if the red LEDs in both ends of the cable are ON.
c. Insert the power jack into the head unit power socket.



3. Vehicle battery

a. Sometimes it is necessary to put the head unit in the engine compartment when testing OBD1 generation vehicles with the diagnostic adapters located near the engine, such as Toyota, Mazda, Kia, Ssangyong, BMW, Mercedes Benz, etc.
b. In case power is not supplied through the diagnostic adapter, connect the alligator clips of the battery power cable to the battery terminals of correct polarity. Check the red LED on the round socket turns ON.
c. Connect the cigarette lighter power cable connector into the battery power cable socket.



4. Power ON

MULTISCAN P2 automatically turns on when power is supplied properly..

D. Contrast

a. The LCD display is sensitive to the temperature.
   It may become too faint when it is cold and too dark when it is hot.
b. If the screen is too faint or too dark to read, you can adjust the contrast by turning the contrast dial in the right side of the head unit.
c. In case of any trouble with the display, please refer to the Trouble Shooting chapter in this manual.

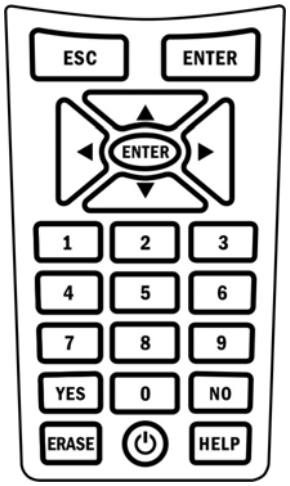
I. Control Keys ----------

A. Keypad

The keypad is made of chemistry proofing PVC material that prevents contamination and damage from hazardous oily workshop environment.

The membrane keypad is designed and tested to maintain its normal operation over a million keystroke for each.

Each key is raised for better tactile feel. The keypad has total of 20 keys.

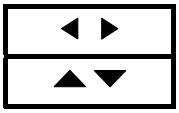


B. Making selection in the menu

1. Numeric Keypad in the bottom

Simply press the corresponding number when making selection from a menu. This is available only when you are selecting an item of which number is 9 or less. For more than 10, you should locate the highlighted bar on the desired item and press the [ENTER] key.

2. Arrow keys in the middle



Page Up/Down

Scroll Up/ Down

a. Scroll up and down the highlighted bar in the menu by pressing Up/Down arrow keys and press the [ENTER] key to confirm the selection.

b. If the menu has more than 12 items, you may have to move between the pages to make selection. You do not have to pound on Up/Down arrow keys to scroll the whole page. Simply pressing the Left or Right arrow key will shift page to page. Move the highlighted bar by pressing the up/down keys when the desired item appears on the screen, and press the [ENTER] key.

c. If differently defined, key instructions will be given in the bottom of the screen.

C. Function keys

1. ESC

Used to abort an operation of MULTISCAN P2 or to return to the upper level menu.

If differently defined, key instructions will be given in the bottom of the screen.

2. HELP

a. DTC Read

- When a trouble code is detected, you can press this key to view the detailed information of the DTC.
- DTC definition, DTC registration conditions and check points are provided (For Korean and Malaysian cars only.)

b. Service Data (Live Data Stream)

- While live data is being displayed on the screen, select a live data item by moving the highlighted bar, and press this key to view the detailed information about the selected item.
- Standard value and technical explanations are provided. (For Korean and Malaysian cars only.)

3. ERASE

When one or more DTC(s) are found, you can press this button to erase the DTC. A query to confirm your intention to erase the DTC will follow.

4. ENTER

a. To confirm the selection after locating the highlight bar on a desired item in the menu.

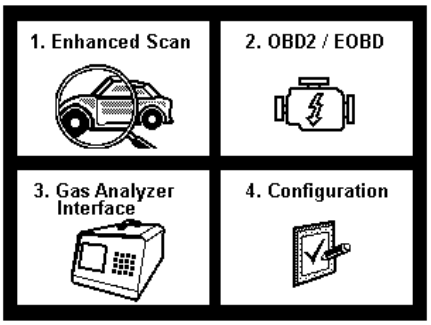
b. To proceed to the next step when the instruction or pop-up message appears.

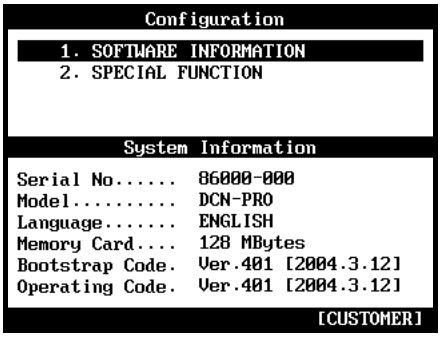
c. To freeze the live data parameter in the top of the screen. Refer to the freeze data function in the following chapter.

d. If differently defined, key instructions will be given in the bottom of the screen.

II. Configuration ----------

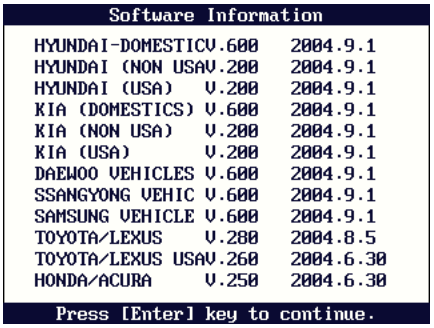
Press the [4] key from the initial function menu to proceed to the configuration menu. You can check the version numbers of the software packages contained in the 512MB memory card, test the keypad and LCD, set up sound and language options and download software updates in the configuration menu.





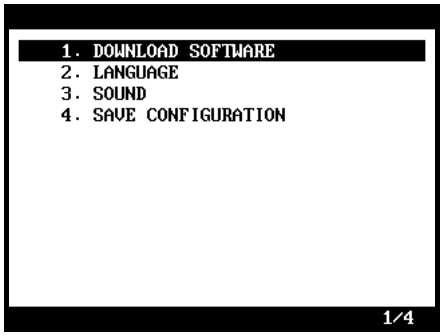
A. Software Information

When you select [1. SOFTWARE INFORMATION] in the configuration menu, a list of software packages contained in the 512MB memory card will appear as below:



Should you get any update files from your local distributor or from Hanatech website, please compare the version number and last update date to check if the update is necessary.

B. Special functions



1. Download software

- You can download the software updates from your PC when you select [1. DOWNLOAD SOFTWARE].
- Instructions will be given separately whenever an update is available. Contact your local distributor for the availability of update frequently and keep posted of such events.

2. Language

- You can select provided language. English and Spanish languages are available for menu selection.

3. Sound

- You can toggle ON and OFF the key sound.

4. Save Configuration

- If you have made any change in this [Special Function] menu, you have to save the configuration to make such changes effective.
- Press the [4] key to save the changes in configuration

CHAPTER 4 FUNCTIONS

MULTISCAN P2 Functions

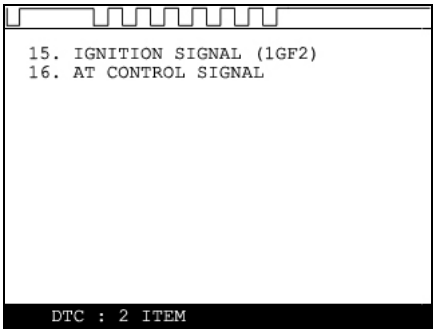
The functions you can choose when all the test vehicle details are selected properly are explained in this chapter of the manual. The actual list of available functions may be different according to the vehicle you want to test.

I. Diagnostic Trouble Code----------

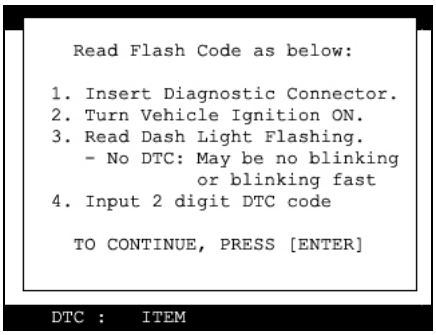
A. DTC Read

1. Pulse signal type

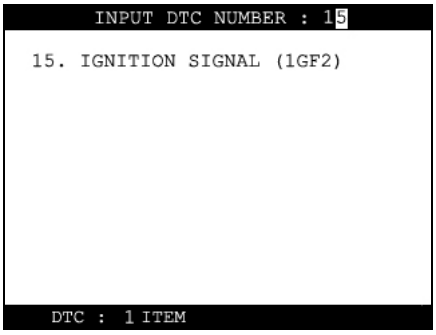
a. Many of old Toyota, Honda, Mazda, Hyundai and Kia cars until early 90's support slow pulse signal output for the DTC reading function.
As shown below, MULTISCAN P2 shows the pulse signal being received through the DLC adapter in the top and the received DTC numbers.



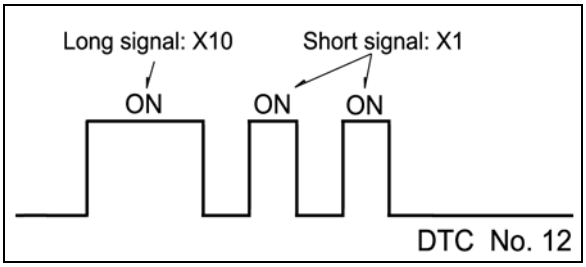
b. Manual input
- Even older cars such as Honda with 2-pin adapter have no signal output terminal for DTC in the DLC adapter. In this case, MULTISCAN P2 shows the following message as there is no signal input through the adapter.



- You have to count the MIL flashing on the dashboard and manually input the DTC number to MULTISCAN P2 to view the details as below:



- Long flash signals count for tens and short signals for ones. Input two digits for tens and ones in sequence using the numeric keypad.
  A flash signal for a code is followed by another if there are multiple trouble codes. Blinking signals for all trouble codes flash in sequence, and repeat after a pause.



c. Others
   - Generally MULTISCAN P2 reads DTC pulse signal from the diagnostic adapter and shows the DTC number, title and details automatically.

2. Serial Communication type

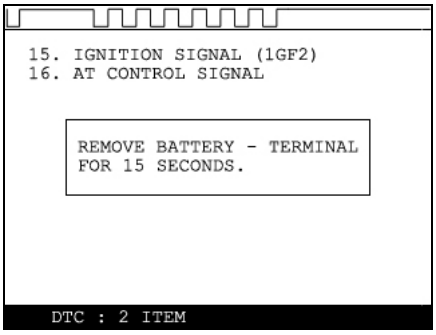
a. Most of the cars built in 1990's or later support serial communication with a scanner, and the DTC is read by bi-directional communication.
b. MULTISCAN P2 sends a command to the control module to reply with the DTC numbers stored in memory, and the control module replies thereupon.

B. DTC Erase (Clear fault code)

1. Pulse signal type

a. Pulse signal type does not support bi-directional serial communication, therefore, a scanner is unable to send a command to the control module to erase the DTC information from memory.

These old cars require you to remove battery terminal to clean up diagnostic information from control module memory.



Removing the battery terminal will get rid of all information contained in the car stereo and other electronic devices. And it may not effectively erase the fault codes in some cars. Refer to the original repair manual for further information.

Check if DTC information is properly removed by reading the trouble code again after erasing the code.

2. Serial communication type

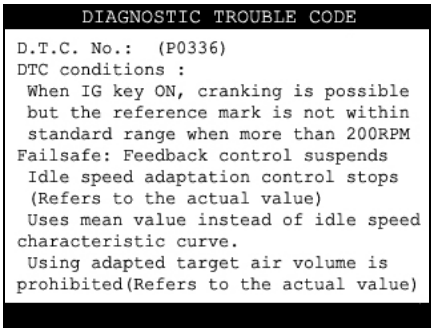
a. MULTISCAN P2 sends a command to the control module to erase DTC information stored in memory, and the control module replies thereupon.

b. Check if DTC information is properly removed by reading the trouble code again after erasing the code

C. DTC Help tips

a. Help tips are provided when you press the [HELP] key after locating the highlighted bar on one of the detected trouble code(s). This function is available when MULTISCAN P2 detects one or more trouble code(s)

b. Help tips including trouble code definition, conditions and check points are provided for all Korean cars and Malaysian cars as of May 2003. Wiring diagrams are also provided for Korean cars of 2000 model-year or older.



c. Press the [ESC] key to return to DTC list.

II. Current Data ----------

(= Data Stream, Live Data, Service Data)

A. Pulse Signal Type

a. Data stream is not generally supported for this type of old cars because the speed of pulse signal communication is too slow to read the data stream variables.

b. Some of old Toyota cars using 17-pin rectangular adapter exceptionally support data readings as the system supports relatively high speed pulse signal communication.

B. Serial Communication Type

a. Most of control systems with serial communication support data stream function. Select [Current data] from the menu, then the data readings follow.

b. Some systems like SRS or ABS may be designed not to support data stream on purpose by the car manufacturer while the other systems are supported. A scanner is a passive tool that reads information from the control system, and it is unable to actively generate information that the system does not provide.

c. Some old OBD1 generation Korean and European cars equipped with Bosch control system that communicates in ISO9141 protocol provide relatively slower communication speed. Data sampling may seem slow with these cars

C. Data Freeze

The [Data Freeze] function places the selected data stream variable on top of the LCD screen so that the user can check and compare desired sensor values continually without having to scroll up and down.

*This is different from **'Freeze Frame Data'** function of Generic OBD2.*

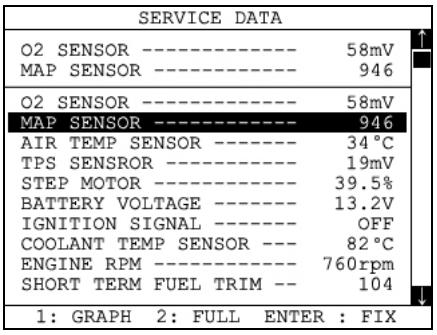
1) Step One

Select a desired sensor using the [◀][▶] and the [▲][▼] keys.

2) Step Two

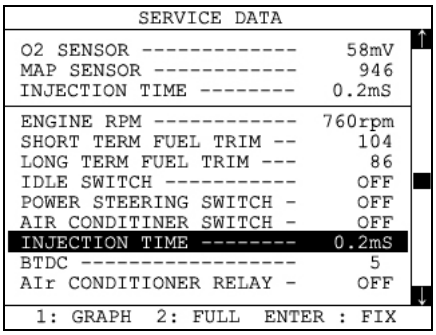
Press the [ENTER] key to freeze the selected sensor.

i.e., when O2 sensor and MAP sensor are selected and frozen, these sensor values will be placed at the top of the display as below :



3) Step Three

Up to five sensors may be frozen at a time. For example, if the Injection Time, which can be shown when scrolled down, is selected and frozen, Injection Time value will be placed below the previously frozen O2 and MAP sensor.

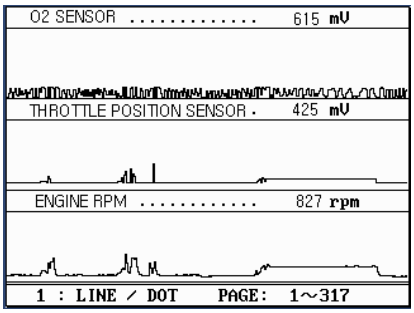


D. Data Graph

MULTISCAN P2 provides the [Data Graph] function for more efficient data analysis.

a When you press the [1] key after locating the highlight bar on the desired sensor, the sensor data graph will be displayed as shown below.

b You can display up to 3 graphs in a screen by choosing the sensors as previously explained [Data Freeze] procedure - Press the [Enter] key after locating the highlight bar on the desired sensor, and then press the [1] key. When more than 4 sensors are selected, the graphs of upper three sensors will be displayed.



c For each sensor data graph, the name of the sensor and its current value will be simultaneously displayed together.

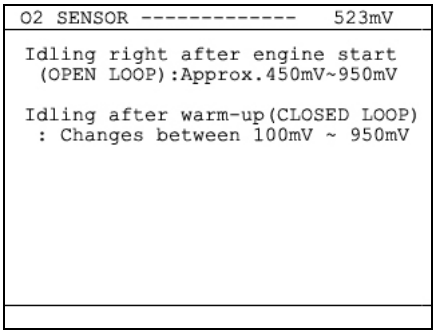
d To change the sensor, go back to the previous Service Data display by pressing the [Esc] key, and then choose other sensors.

e To halt the graph output, press the [ENTER] key. It will resume when you press the [ENTER] key again.

E. Help tips

a When you press the [HELP] key after locating the highlight bar on a certain data stream variable, the help message will be displayed. This works the same for detected Trouble Codes in [Self Diagnosis] function.

b Detailed information including conditional standard range on the selected sensor will be displayed as shown below.



c Press the [ESC] key to go back to the data stream display.

III. Actuation Test ----------

- The actuation test is a very helpful function that temporarily activates or stops a certain actuator such as an injector, a motor or a solenoid by force, so that the user can evaluate the system's condition or the part's normal operation by observing its reaction

- Signals from various sensors are input to a control unit, and the actions are taken by controlling to actuators. Sensors and actuators are causes and effects in a control system.

- While the data stream function is useful to observe if the sensors are working properly and the control unit is collecting correct data from the sensors without problem, the actuator test is helpful to examine if the actuators are working in normal conditions and the control unit is commanding proper control over the system.

- Some of the cars such as Nissan or Toyota provide even more advanced actuation tests by letting the user observe the reaction of overall control system when manually adjusting the sensor input values.

A. Menu Selection

a Choose [ACTUATION TEST] from the function Selection Menu

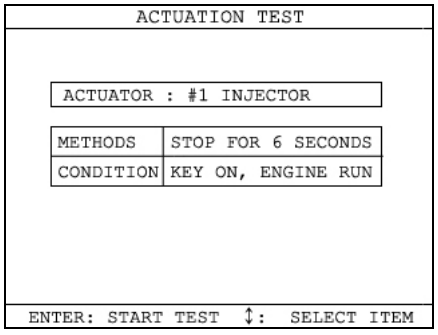
b The name of the actuator to be tested, test method and the test condition are shown in the display. Available actuators, test methods and conditions may differ in each vehicle.

B. Test Start

1. Selecting Test Item

a Choose an actuator to test from the menu by using the [▲] and [▼] keys.

b Check the test conditions and press the [ENTER] key when all the conditions are met.



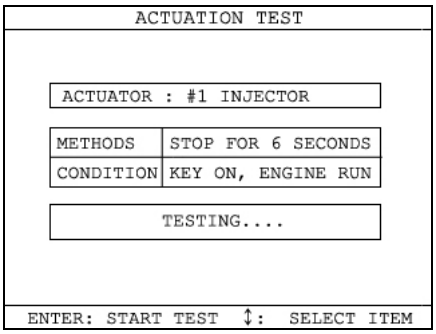
2. Testing

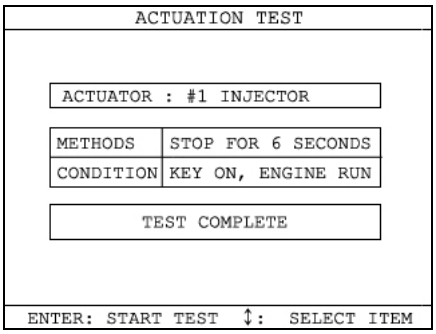
a [TESTING...] message will be displayed during the actuation test
Test method means how the actuation test will be performed. Check the actual reaction of the actuator

b In the example below, the injector will stop injecting fuel for 6 seconds

while engine is idling, and it will make engine stall or unstable.

c Testing a fan or an injector is easy to check the proper reaction as it generates distinctive changes in vehicle condition such as fan whining or unstable idling. However, valves or motors are generally tested while engine is stopped and all you can hear may be a small and unclear electric buzzing sound. Test in a quiet place and observe the test results carefully.





d When the test is completed, the [TEST COMPLETE] message will be displayed. You can choose other actuators by using the [▲] and [▼] keys. Press the [ESC] key to quit test mode.

IV. Black Box ----------

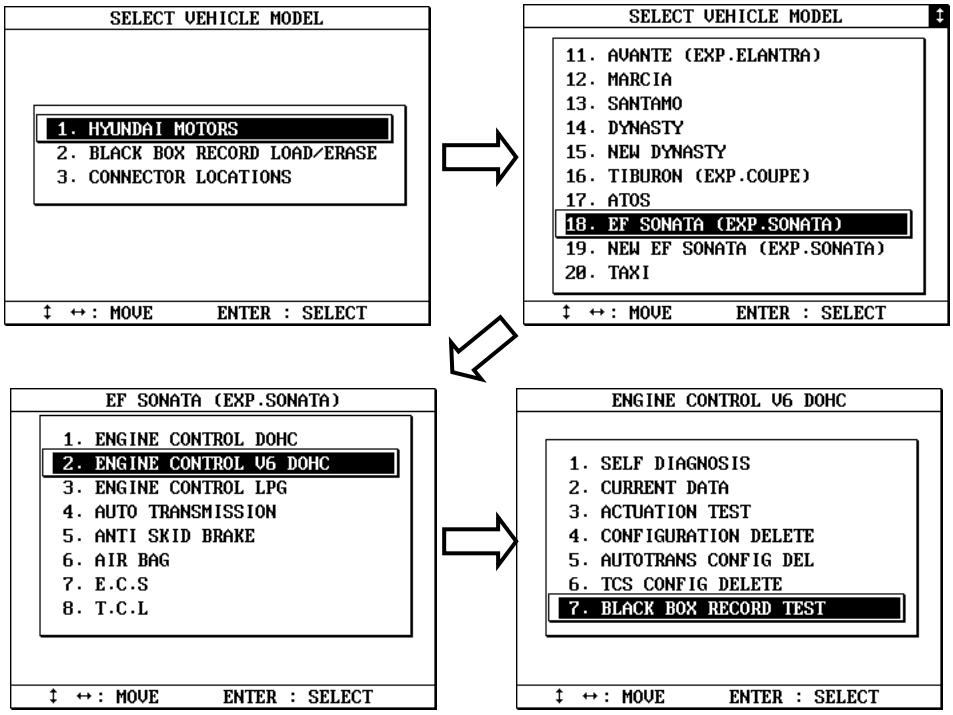
(= Record Replay)

Just like the 'Black Box' or a ‘flight recorder’ of an aircraft, MULTISCAN P2 can 'record' data stream during the vehicle drive test and the recorded data can be 'retrieved' later for intensive analysis of vehicle's condition.

MULTISCAN P2 has a menu, so called “Record Replay” same as Black Box function and you can understand “Record Replay” as Black Box function

A. Function selection

Choose [#. Black Box Data] from the [Function Selection Menu] after selecting Origin, Car Manufacturer, Model name and system to test.



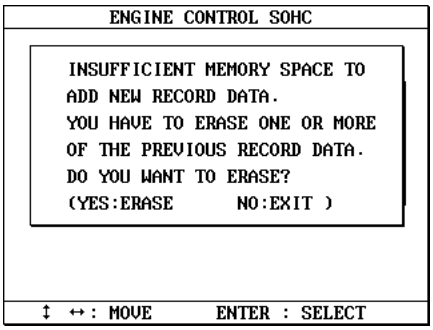
B. Capacity

a During a normal test, the [Data Stream] frames pass by in rapid succession, and cannot be recalled unless the data has been saved. Thanks to its extensive internal memory, MULTISCAN P2 can record up to 2040 frames of Data Stream for multiple cars.

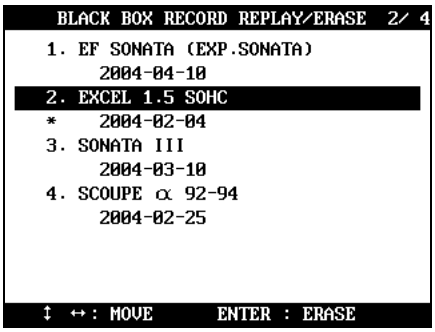
b By loading the recorded data, you can diagnose sensor data frame to frame without missing a single critical moment.

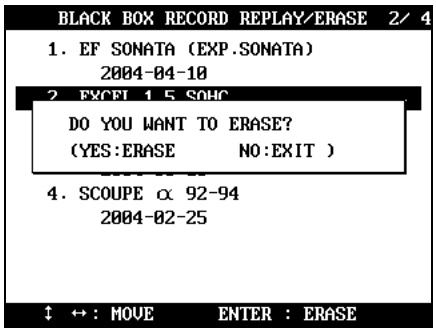
C. Memory Check

a. MULTISCAN P2 checks its internal memory before it starts recording Black Box data. If there is no sufficient free memory space available, MULTISCAN P2 will suggest deleting one or more of previous record(s).



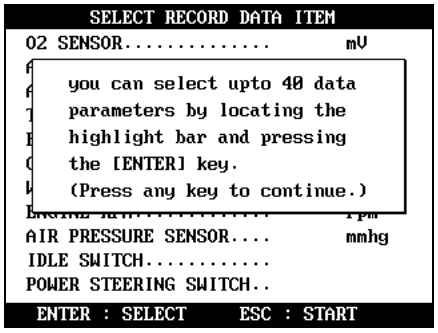
b. Press the [ERASE] key to proceed, then a list of saved data will follow. Locate the highlight bar on data to delete, and press the [ENTER] key. A query for your confirmation will follow. Press the [YES] key to erase otherwise press the [NO] key.





D. PID(Live data parameter) selection

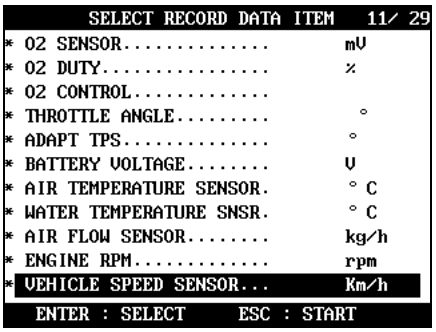
a You are required to select the parameters to record.

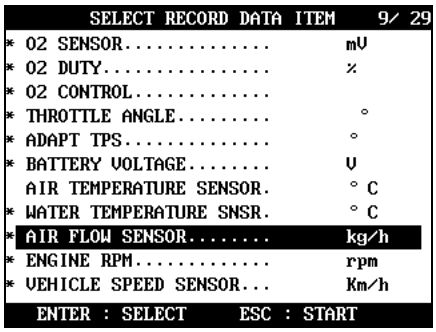


b MULTISCAN P2 will show you the whole live data parameters available in the control system you selected. Locate the highlight bar on the desired parameter and press the [ENTER] key.

Selected parameter will be marked star(*).

You can also deselect the parameter by repeating the procedure.

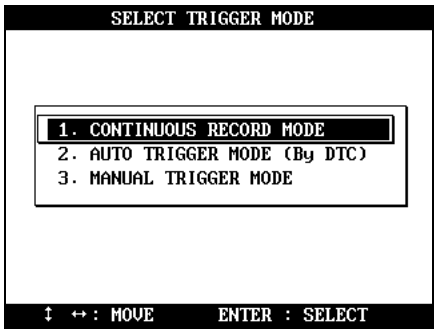




c You can select up to 40 PIDs to record. Press the [ESC] key when the selection is completed, then MULTISCAN P2 will start recording data.

E. Trigger Modes

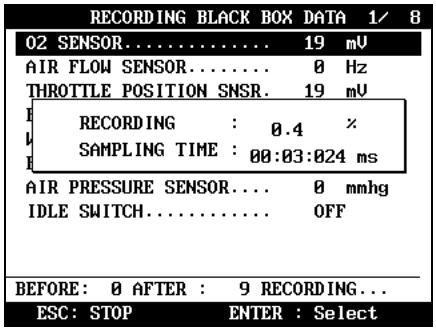
There are three trigger modes in the black box function.



a Continuous Record Mode (No trigger mode)

- MULTISCAN P2 will record live data of selected parameters up to 2040 frames or until you press the [ESC] key.

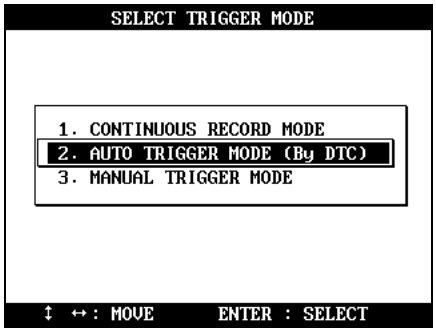
- Percentile memory usage and sampling time(frequency) will appear in the center of the screen while recording data, and the actual live data values will remain unchanged.



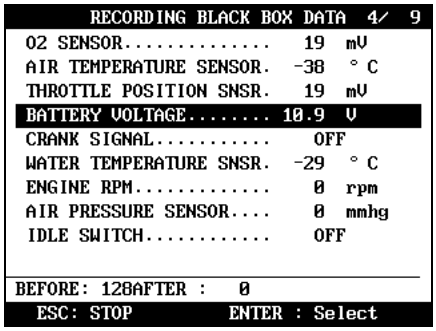
- Since no DTC trigger is applied in this mode, number of “Before DTC” frames will remain 0, and the “After DTC” will keep increasing as the more frames are recorded.

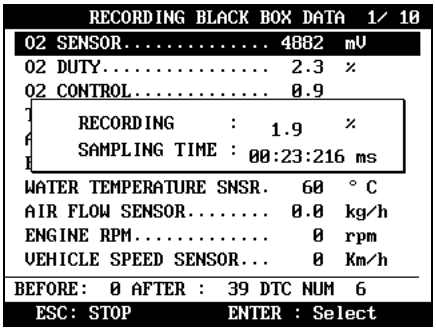
b Automatic Trigger Mode (Triggered by DTC)

- MULTISCAN P2 will keep recording live data of selected parameters up to 128 frames.
- Once a DTC is detected or the [ESC] key is pressed by the user, it will proceed with recording remaining frames up to 2,040 or until you abort.
- This function will let you have a set of data stream before and after the ECM's DTC recognition when you perform the test drive.



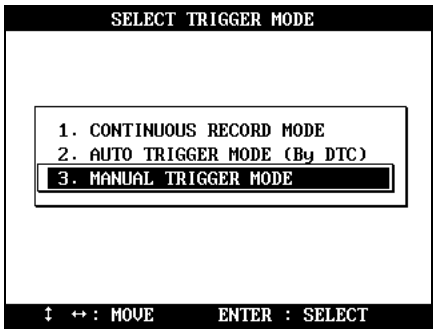
- Before DTC, you will see the Live Data of the selected parameters keep refreshing, however, once triggered by DTC or [ESC] key stroke, only the percentile process information and sampling frequency will be displayed.





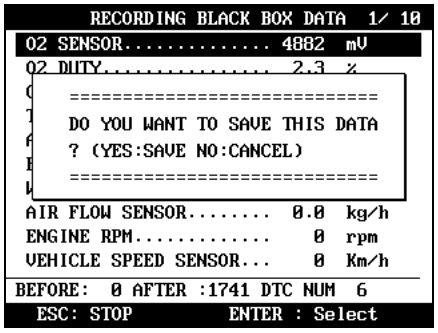
c Manual Trigger Mode

- MULTISCAN P2 will keep recording live data of selected parameters up to 128 frames, and once the [ESC] key is pressed by the user, it will proceed with recording remaining frames up to 2040.
- The screen display is the same as when selecting the Auto Trigger Mode.



F. Saving the recorded data

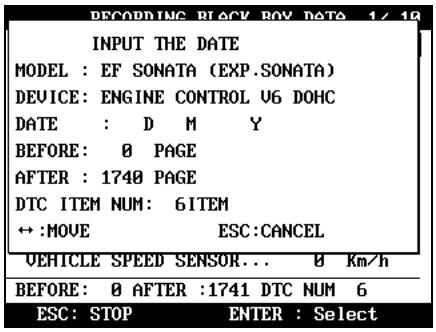
a When the total frame number reaches 2040 or when you press the [ESC] key to abort, a query asking you if you would like to save recorded data or to discard it. Press [YES] to save or [NO] to cancel.

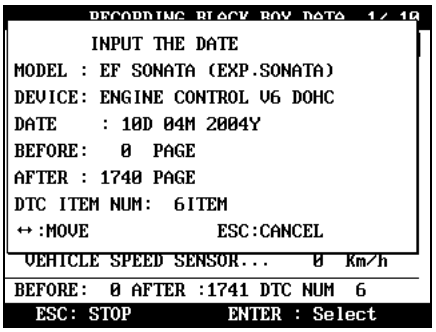


b When pressed [YES], a dialog box follows and asks you to input the test date. Enter the date and press the [ENTER] key to save the recorded data to MULTISCAN P2 memory.

Pressing the [ESC] key cancels saving data.

Date format is DD-MM-YYYY(D-day, M-month, Y-year), and only numeric values are available.

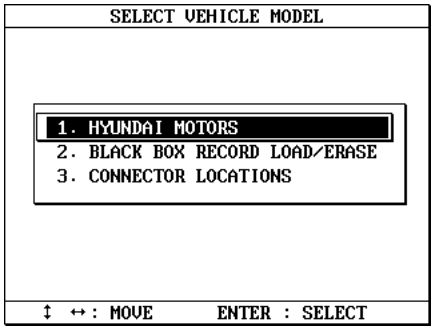




c Tested Vehicle model name and control system will be saved as well as the date stamp for future retrieval.

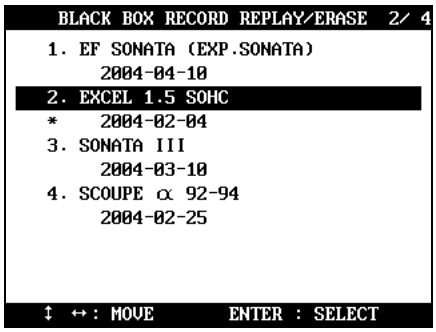
G. Black Box Data Load

a You can load saved data by choosing [BLACKBOX RECORD LOAD / ERASE] from the [Car Manufacturer Selection] menu as shown below:



b A list of recorded Black Box Data will follow for your selection

Up to 4 black box data can be stored in the memory per car manufacturer, therefore, up to 4 saved black box data can be listed in the menu.



c The details of recorded data will be displayed for confirmation. If the record is correct, press the [ENTER] key. Press the [ESC] key to abort.

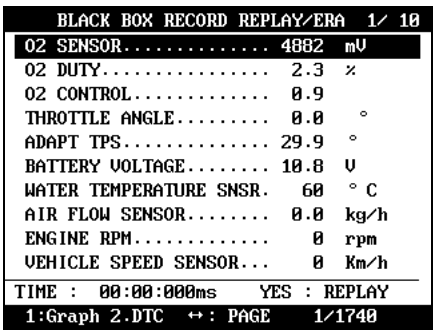
d If you want to erase any of these saved data, locate the highlight bar and press the erase key.

H. Loaded Blackbox data

Loaded black box data has basically the same format as the [Service Data (Live Data Stream)]. See the illustration below.

1. Data format

In the lower part of the display, the total number of recorded frames, frame number before and after the DTC(Diagnostic Trouble Code), and the number of DTC detected is displayed. In the example below, you can see that a total of 458 frames were recorded, and data stream currently shown in the main window is of the 336th frame from the beginning. It also tells you that the current frame is the 80th after 2 trouble codes were detected.

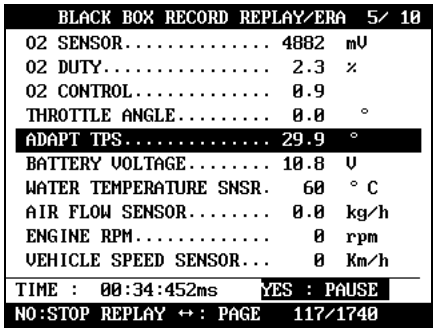


The live data values may not be realistic as the screen was captured while the scan tool was linked to a simulator.

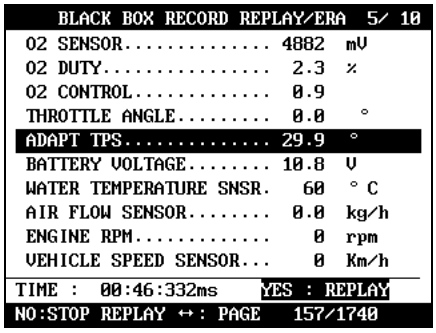
2. Data Replay

a. Press the [YES] key then the saved black box data will start replaying. MULTISCAN P2 preserves the refresh time intervals of Black Box data. Therefore, Black Box data is replayed at the same speed as when it was originally recorded.

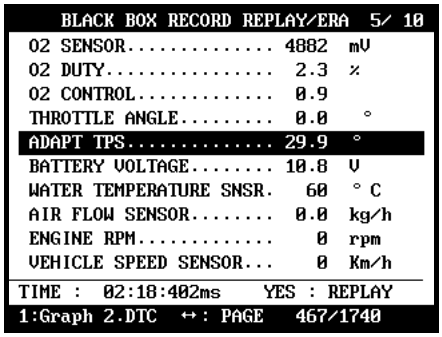
b. If you want to go forward or backward faster, press the [◀] or [▶] key while replaying. Replay speed will restore to the original speed when the key is released.



c. Pressing the [YES] key will pause the replay. You can resume replaying from the frame where it was paused by pressing the [YES] key again.



d. Pressing the [NO] key will stop replaying. You can restart replay by pressing the [YES] key again, but it will start from the first frame.

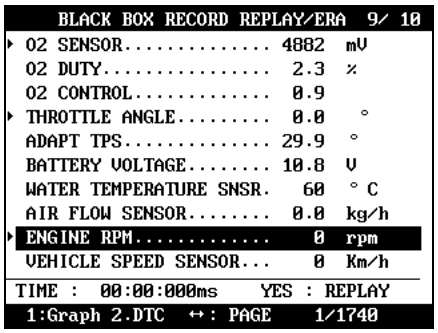


3. Graph

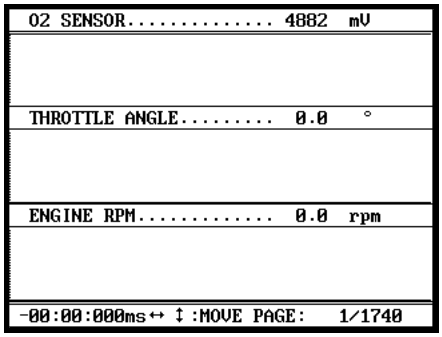
a As previously explained in section [3. Service Data], data from up to three selected parameter data can be graphed.

b Make sure that the Black Box data replay is stopped. If it is being replayed or paused, press the [NO] key to stop replaying completely.

c Choose the parameter by locating the highlight bar and pressing the [ENTER] key. The selected parameter will be marked with a triangle as shown below:



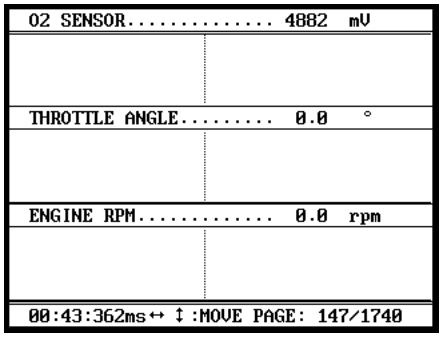
d Then press the [1] key to view the data in graph format.



The line graphs are flat as it is not based on data recorded from the active vehicle.

e Up to 316 frames can be displayed on a single page.
If recorded data has more than 316 frames, you can shift to next or previous page by using the [▲] and [▼] keys.

f The dotted line indicates from which frame the live data parameter values are being displayed. You can move it left and right with the [◀] and [▶] keys.



g Elapsed time and frame number are indicated in the bottom.
- *Continuous Record (No trigger) Mode*: Elapsed time and number of frames from the first frame.
- *Automatic / Manual Trigger (Triggered by DTC or user) Mode:* Elapsed time and number of frames from the trigger point (DTC detection or [ESC] key stroke by the user). Before the trigger point will be marked in negative values.

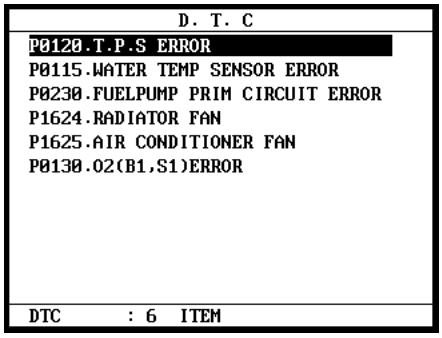
h To return to the Black Box Data Display, press the [ESC] key.

4. DTC

a You can check the DTC(s) found during recording Black Box Data.

b Make sure that the Black Box data replay is stopped. If it is being replayed or paused, press the [NO] key to stop replaying completely.

c Press the [2] key then the list of DTC(s) will appear as below:



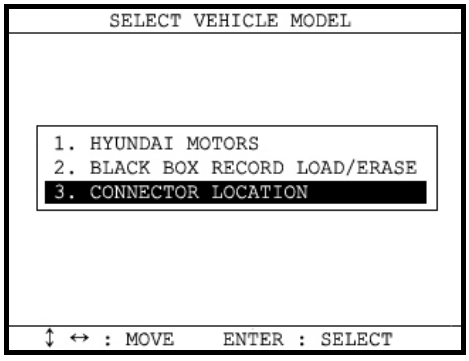
d Because Black Box Data is not live or active, you cannot erase DTC(s).

V. Connector Location ----------

a The vehicle side OBD2 adapter is easy to find as the location is quite regular – under the dash, however, the old vehicle side DLC adapters of OBD generation 1 are located quite randomly and sometimes it is very difficult to find.

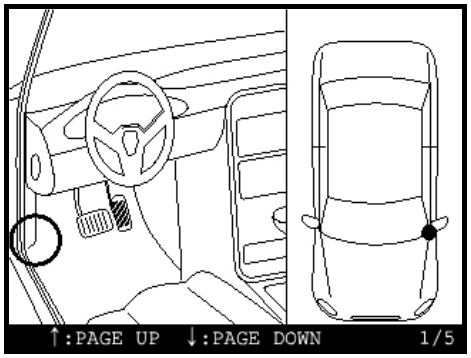
MULTISCAN P2 has the vehicle side adapter location maps for some car make to aid the user in locating the adapters.

The locations suggested in this function are purely from Hanatech's experience, therefore, it may contain incorrect information. It is always highly recommended to refer to the original repair manual published by the car manufacturers for correct information and there are some makes which does not have adapter location map for the reason of on going S/W enhancement.

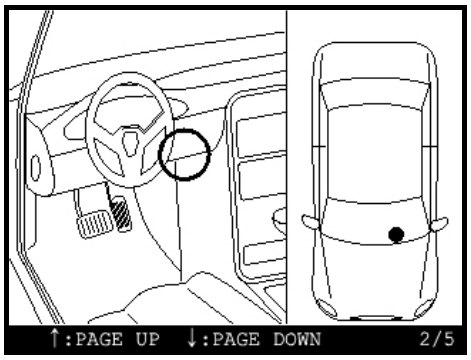


b Select [CONNECTOR LOCATION] from the vehicle selection menu if the adapter is not found in the place where it is supposed to be.

A drawing indicating the location of the vehicle side adapter follows. In the right bottom of the display, the total number of location maps for the selected car make is indicated. The example below is when Hyundai motors is selected, and it tells there are total 5 maps.



c The maps are provided in the order of most frequently found location. Press Up or Down key to view the next or previous map. Press the [ESC] key to return to vehicle selection menu.



d Location maps for Korean cars are based on Left Hand Drive vehicles, and the others such as Japanese, Australian and Malaysian cars are based on Right Hand Drive cars. You may have to consider reversed image according to your local practice.

Refer to each car make section in this manual for further information.

VI. Immobilizer ----------

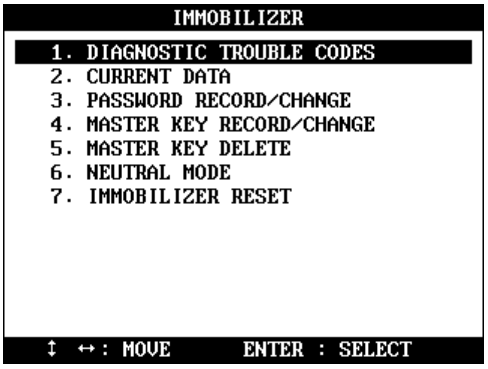
A. MULTISCAN P2 provides diagnostic functions on Immobilizer systems. The function includes Key Coding as well as DTC Read/Erase or Live Data functions in some car makes such as Hyundai, Kia, Australian Holden, Australian Ford and Mitsubishi, and such OEM level functionality is expected to be extended to the other car makes as further development is carried out..

B. Immobilizer system is case sensitive because it is directly related with the security issues. Misuse or improper operation of the this key coding or programming function may result in break down of the system and immobilize the vehicle, which generates greater loss of money and time for restoration.

Hanatech recommends this function to be used only by the trained and authorized technicians with thorough understanding of the whole procedure, for lawful repair purposes only.

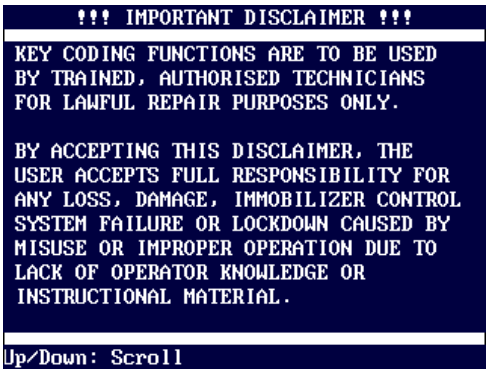
The user is fully responsible for any loss, damage, immobilizer systems failure or lock down caused by misuse or improper operation due to lack of operator knowledge or instructional material

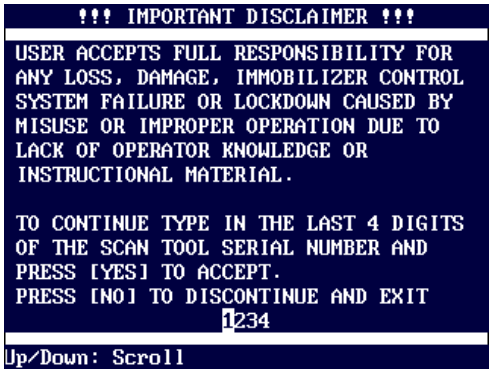
C. If you select any key copying, coding, reset or programming function from an immobilizer system function menu, a disclaimer will appear on the screen asking to read the warning message as shown below:



Read the whole disclaimer by using the [up] / [down] arrow keys, and type in the last 4 digits of the serial number in the bottom of the screen and then press the [YES] key to proceed to the next step.
Pressing the [NO] key will abort the function.

The serial number is found in the back of the base unit behind the grip belt. You cannot type in the numbers unless you scroll the whole disclaimer down to the last line.





CHAPTER 5 GENERIC OBD2

Generic OBD2

I. Literal definition of OBD and OBD2-------

OBD is an abbreviation for On Board Diagnostics. OBD-1 is in reference to Title 13 California Code 1968 titled "Malfunction and Diagnostic System for 1988 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles with Three-Way Catalyst Systems and Feedback Control." filed on 11-15-85. This required cars sold in California to have an on-board computer processor for on-board self-diagnostics of computer sensed emission related components, fuel metering device and EGR (exhaust gas recalculation system). A partial or total malfunction that exceeded exhaust emission standard would illuminate a MIL (malfunction indicator light) and provide on-board identification of the malfunction location. To provide malfunction location information, codes are stored in on-board computer memory. To read codes manufactures use methods, such as flashing MIL light or various serial data protocols.

OBD-2 is in reference to Title 13 California Code 1968.1 titled "Malfunction and Diagnostic System Requirements-1994 and Subsequent Model-Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Vehicles and Engines. Filed on 8-27-90 to Air Resouce Board (ARB)
This requires a standard electrical connector, open source standardized diagnostic trouble codes (DTC), data, and communication protocol with more specific self-diagnostic on-board monitoring of emission malfunctions.

II. More practical notes ----------

A. Technical meaning of OBD2

1. Standardization

a For the technicians and scan tool engineers, OBD2 has its technical meaning as bringing the standardized methods of vehicle diagnosis to the chaotic aftermarket where dozens of car make use different diagnostic adapters and communication protocols of their own.

b The 16-pin trapezoid diagnostic adapter and a few of most influential communication protocols including ISO9141-2, KWP2000, and SAE J1850 VPW and PWM form the standard OBD2 specifications.

c Trouble codes and Data stream variables were also standardized and opened to public, so that all the scanners that support aforementioned standard communication protocols through the 16-pin OBD2 adapter can always get the same readouts.

2. Purpose of OBD and OBD2

a. OBD and OBD2 are the names of regulation that were legislated in USA for the emission control.

b. On board diagnostics was implemented to monitor malfunction or failure of the emission related parts and components to minimize the possibility of excessive exhaust gas emission by letting the driver know that the car has a problem and the technician immediately perceive what is the problem when any trouble is detected in the emission control system. And OBD2 became effective later to increase the efficiency of OBD by standardization.

B. Generic OBD2 and Enhanced OBD2

1. Generic OBD2

a. OBD2 was implemented for the emission control. Therefore, the standardization is limited to powertrain system that is directly related to emission control. It is not mandatory for the other systems such as ABS and SRS

b. Not all the trouble codes and data stream variables are standardized, also. A list of trouble codes and data stream variables that are closely related to emission control are defined as OBD2 standards, however, it also allows more codes and variables reserved for car make's own definition and usage. These standardized parts of trouble codes and data stream variables are so called Generic OBD2. Generic OBD2 application is limited to emission related systems and so is the diagnostic readouts

2. Enhanced OBD2

a. Generic OBD2 has limited availability for overall diagnosis, however, an actual car has a lot more than this. The control systems other than powertrain are not included in the mandatory OBD2 regulations, and each car make has different trouble code and data stream definitions for the reserved non-standard fields of powertrain system.

b. The scope of on board diagnostic system that OBD2 standard features do not cover is called Enhanced OBD2.

3. Manufacturer's OBD

a. Many of Non-USA cars of 1996 model-year or later have an OBD2 16Pin adapter, however the communication with scanners does not follow standardized OBD2 protocols.

b. These car makes maintain their own communication features that are not

much different from OBD generation 1 but only the appearance of diagnostic adapter. This is so called MOBD or manufacturer's OBD.

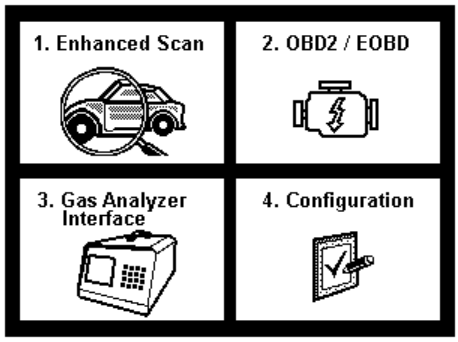
c. With MULTISCAN P2, MOBD communication is supported for all car makes that are included in the coverage list.

III. MULTISCAN P2 and OBD2 ----------

A. Generic OBD2 in MULTISCAN P2

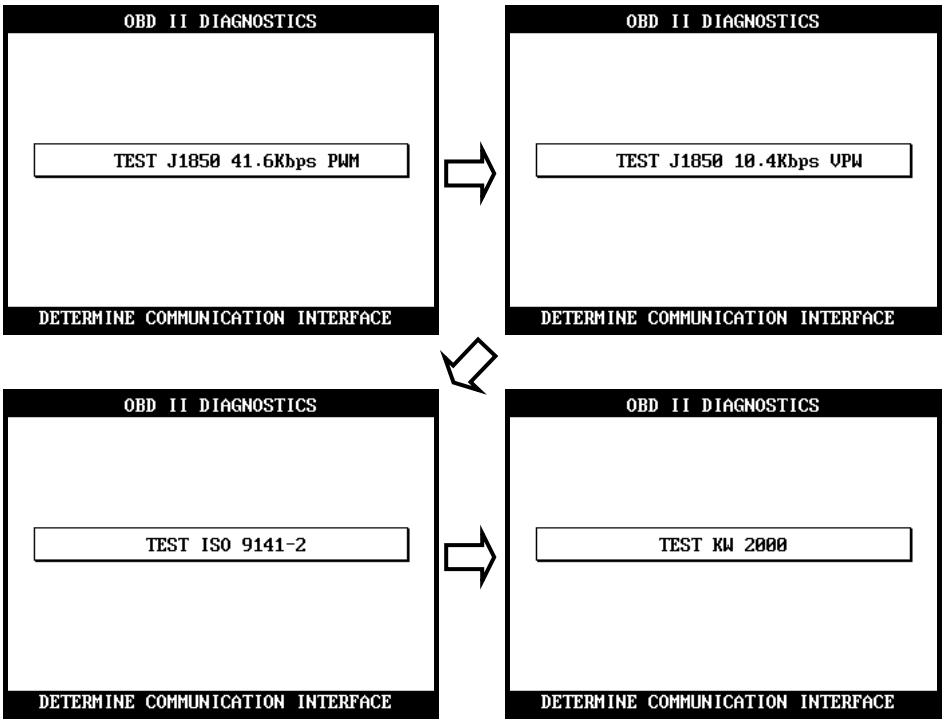
1. General OBD2

a You will find General OBD2 (OBD2/EOBD)category in the initial menu.

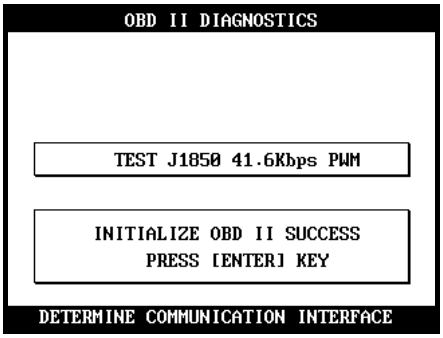


b Selecting [2.OBD2/EOBD] will be followed by the diagnostic adapter suggestion. Press the [ENTER] key to proceed.

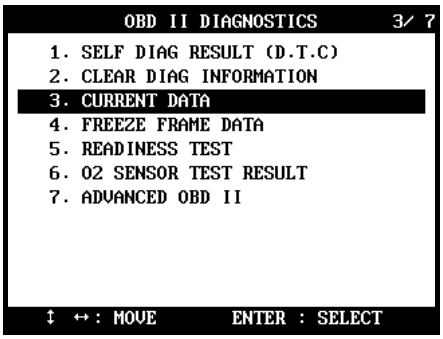
c MULTISCAN P2 then automatically tries to establish communication with the powertrain control module using standard OBD2 communication protocols in turn.



d When succeeded in communicating with the control module with any of these 4 standard protocols, MULTISCAN P2 reports the successful establishment of communication and waits for your command to commence generic OBD2 diagnosis as below:



e Available functions for the generic OBD2 system is listed as shown below:



f In case the control module does not respond after trying all OBD2 standard protocols, MULTISCAN P2 shows the failure report and check points as below:

2. When to select

You may select this General OBD2 when you are sure that the test vehicle is OBD2 compliant but not included in the vehicle coverage list.

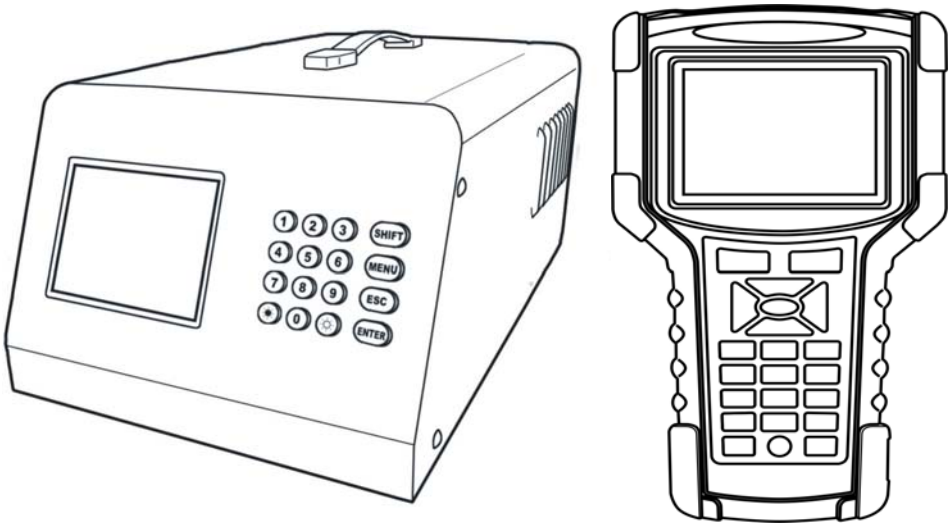
3. EOBD

a In Europe, EOBD has become mandatory from January 1, 2001, and all the cars built in Europe since then on must have been generic OBD2 compliant.

b You may select General OBD2 of DCN-PRO for the diagnosis of European cars for 2000 and later model year vehicles for the powertrain system. .

CHAPTER 6 GAS ANALYSER INTERFACE

Gas Analyser Interface



The interface between the scanner and the gas analyser is available between Gas analyser and MULTISCAN P2 scanner. HOST-PRO PC interface program is also necessary to add the real-time PC interface features.

This chapter of the manual explains the operation of scanner side for the interface.

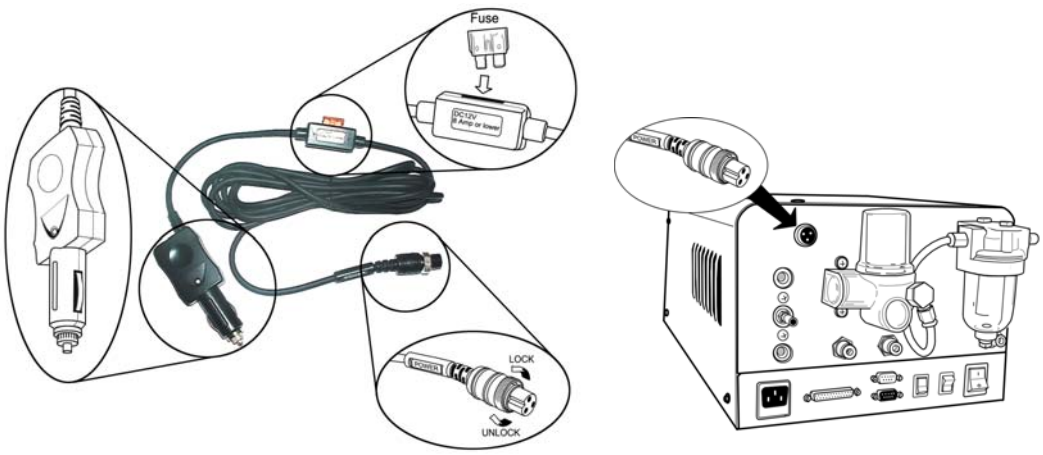
Carefully read the manual for the gas analyser that is separately provided to become familiar with the operation of the gas analyser before using the interface functions.

I. Set up ----------

A. Power supply

a Refer to Gas analyser manual when using the analyser alone without interfacing with the scanner.
This chapter explains the operation when the gas analyser is used in the vehicle interfaced with the scanner.

b Connect the cigarette lighter power cable to the cigarette lighter socket. And connect the other end to the 3-pin power socket in the rear panel of the gas analyser



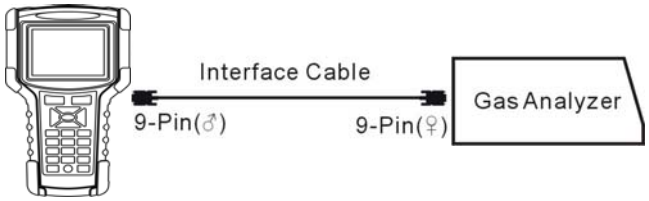
c Gas analyser begins to warm-up when power is supplied. Warming up takes 4 to 6 minutes in normal condition. It may take up to 15 minutes when it is cold and it is dependent to the actual air temperature.

B. Cabling

1. Scanner – Gas analyser interface

a Connect the 9-pin male connector of the gas analyser interface cable to MULTISCAN P2 RS232 adapter.

b Connect the 9-pin female connector to the gas analyser.

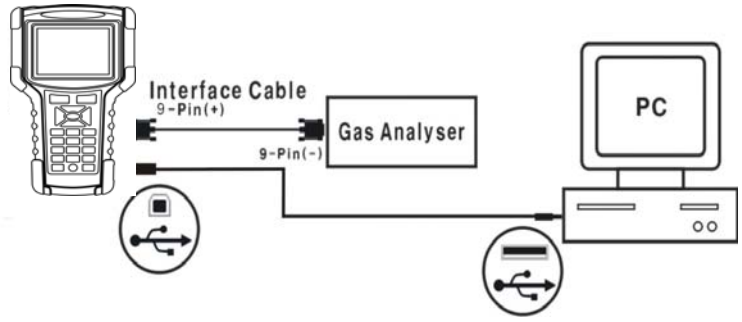


2. Adding PC to the network

a Using HOST-PRO real-time PC interface, you can connect MULTISCAN P2 with your PC maintaining the interface between the scanner and the gas analyser.

b Connect the 15-pin female connector of the split cable to HOST-PRO USB module 15-pin male connector.

c Connect the USB cable to the PC

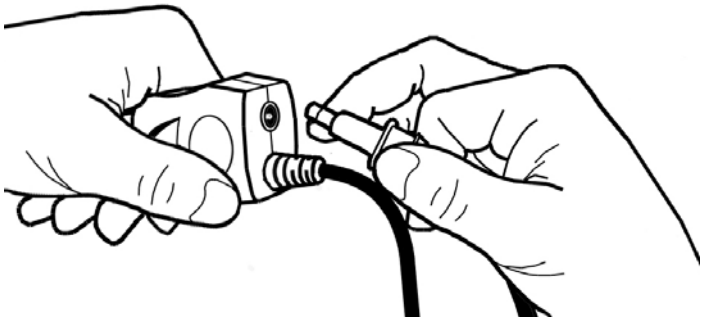


d HOST-PRO is scheduled to be supplied free of charge for MULTISCAN P2.

If a printer is installed to the PC, you can print out the measurements with the printer regardless of brand name, model and supported print mode.

C. Power supply

Connect one end of the secondary power cable that is supplied with the gas analyser to the auxiliary power socket of cigarette lighter plug, and the other end to MULTISCAN P2.



II. Operation ----------

There are two ways you can get the gas readings using scanner interface:

a Remote control mode

MULTISCAN P2 works as a remote control module.

All screenplays of the gas analyser are transferred to MULTISCAN P2 and you can control the operation of the gas analyser with the scanner.

b Data Stream mode

MULTISCAN P2 works as a data receiver.

Gas readings are provided as a part of data stream. You can view both of scanner data stream information and gas measurements at the same time with MULTISCAN P2.

MULTISCAN P2 must be communicating with both vehicle control module and the gas analyser at the same time.

In either mode, gas analyser ceases to display gas measurements on its LCD and shows the message saying “Communicating with scanner”.

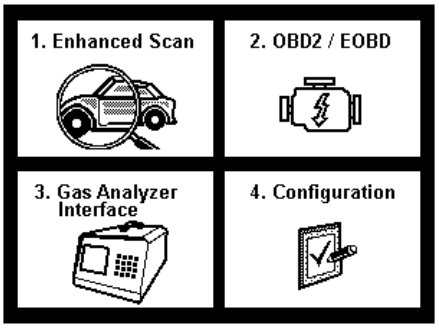
You have to set the gas analyser to be ready for scanner interface by selecting [Scanner communication mode] after pressing the [MENU] key of the gas analyser before initiating MULTISCAN P2 & gas analyser interface function. Refer to the gas analyser manual for further information.

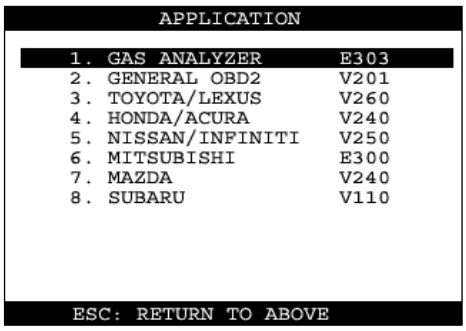
A. Remote control mode

Basically, all the functions and screenplays are the same as when using the gas analyser alone. You can simply regard that the front control panel of the gas analyser has transformed to MULTISCAN P2.

1. Menu selection

a Turn on MULTISCAN P2 by pressing the [POWER] key.
And select [1. SCAN] by pressing the [1] key at the initial menu.
Then the car make selection menu follows as below:





2. Operation

Refer to the separate gas analyser manual for detailed functions.

You have to set the gas analyser to be ready for scanner interface by selecting [Scanner communication mode] after pressing the [MENU] key of the gas analyser before initiating MULTISCAN P2 & gas analyser interface function. Refer to the gas analyser manual for further information.

B. Data Stream Mode

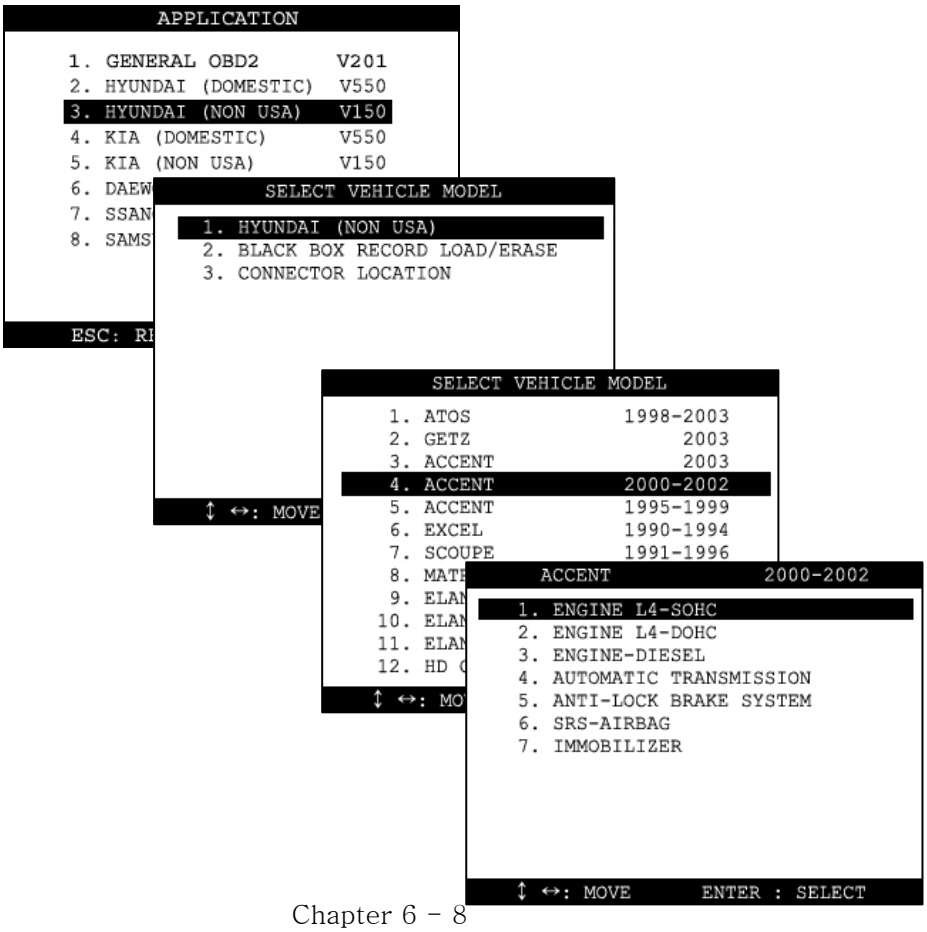
MULTISCAN P2 works as a data receiver.

Gas readings are provided as a part of data stream. You can view both of scanner data stream information and gas measurements at the same time with MULTISCAN P2.

Gas readings are listed in the last part of the scanner data stream

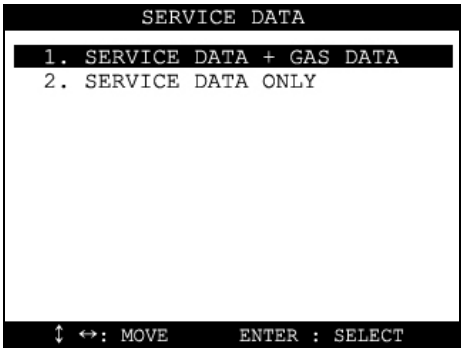
1. Usual scanner menu selection

a. Select a specific model name and system you want to test as usual.
The procedure is the same as using MULTISCAN P2 separately.



b. With or without gas readings

When you select [Service Data (=data stream, live data)] from the function menu, following query follows when the gas analyser is interfaced with MULTISCAN P2. In case these two machines are not interfaced, MULTISCAN P2 will skip this menu selecting procedure.



c SERVICE DATA + GAS DATA

Select this to view the gas readings together with conventional scanner data through MULTISCAN P2 and DCN-Gas analyser interface.

d SERVICE DATA only

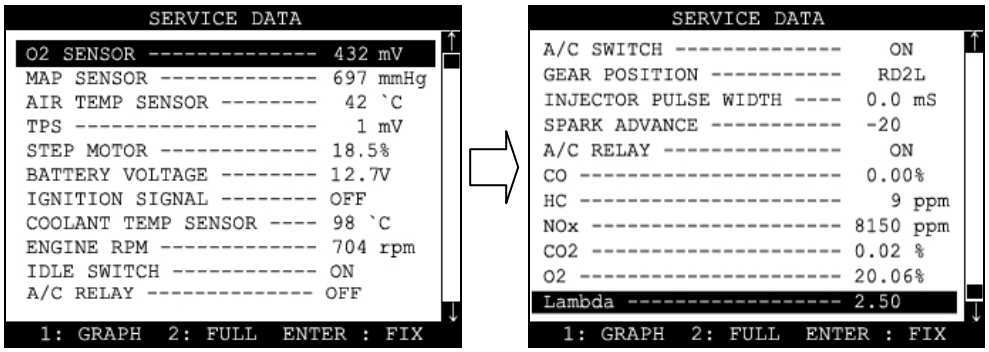
Activates usual scanner operation and only data stream without gas analyser readings is provided

Make sure that the test vehicle supports serial communication that provides data stream. Scanner – Gas analyser interface is not available for the old cars without data stream functions.

2. Data stream with gas readings

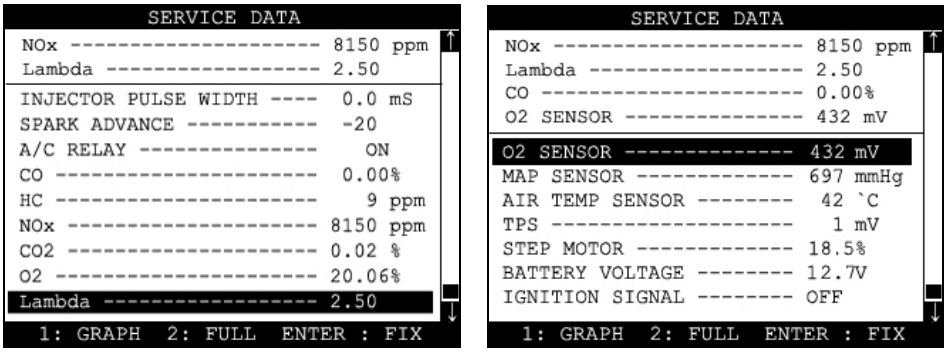
a Gas readings are available only when the gas analyser is properly interfaced with MULTISCAN P2 and ready for data transmission. Refer to the gas analyser manual for further information.

b You can find the gas readings in the end of data listing.
Use [▲] and [▼] keys to scroll up and down, or [◀] or [▶] for page up/down.

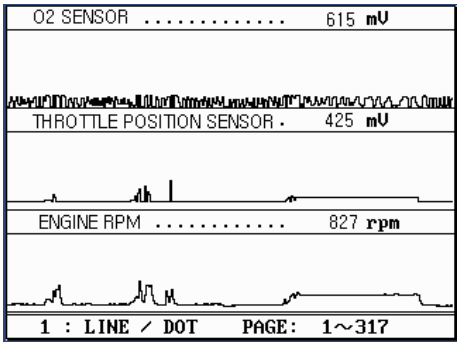


3. Data Freeze / Graph

a. You can place up to 5 sensor or gas readings on the top of the screen by pressing the [ENTER] key after locating the highlighted bar on the item. The selected items remain in the top of the screen while you are scrolling up and down the screen to view other data readings.



b. You can select up to 3 items in the same way and view the readings in graphic form by selecting [1. Graph] during the data stream display.



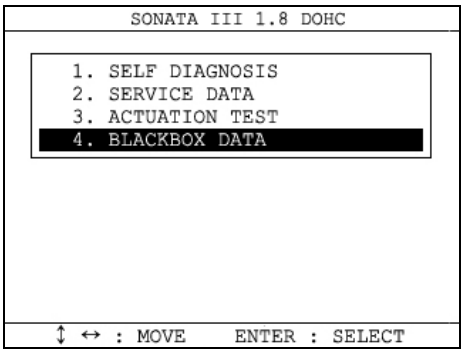
c. Refer to [Chapter 4. Functions] for further information.

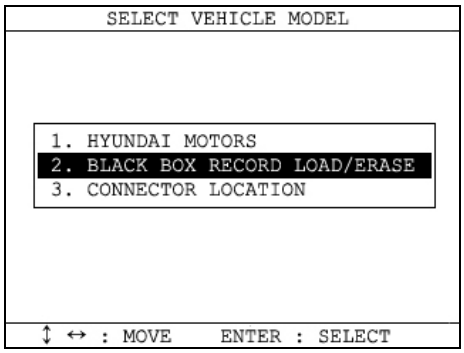
4. Black Box Record

a. You can download both of scanner data and gas readings to MULTISCAN P2 memory using this function. Black box function of MULTISCAN P2 scanner works the same in the gas analyser interface mode as well. Refer to [Chapter 4. Functions] for further information.

b. To record data stream and gas readings together, select [Blackbox Data] from the function menu after selecting a system to test.

c. Select [Blackbox record load/erase] after the car make selection menu to reload or erase the saved blackbox data.



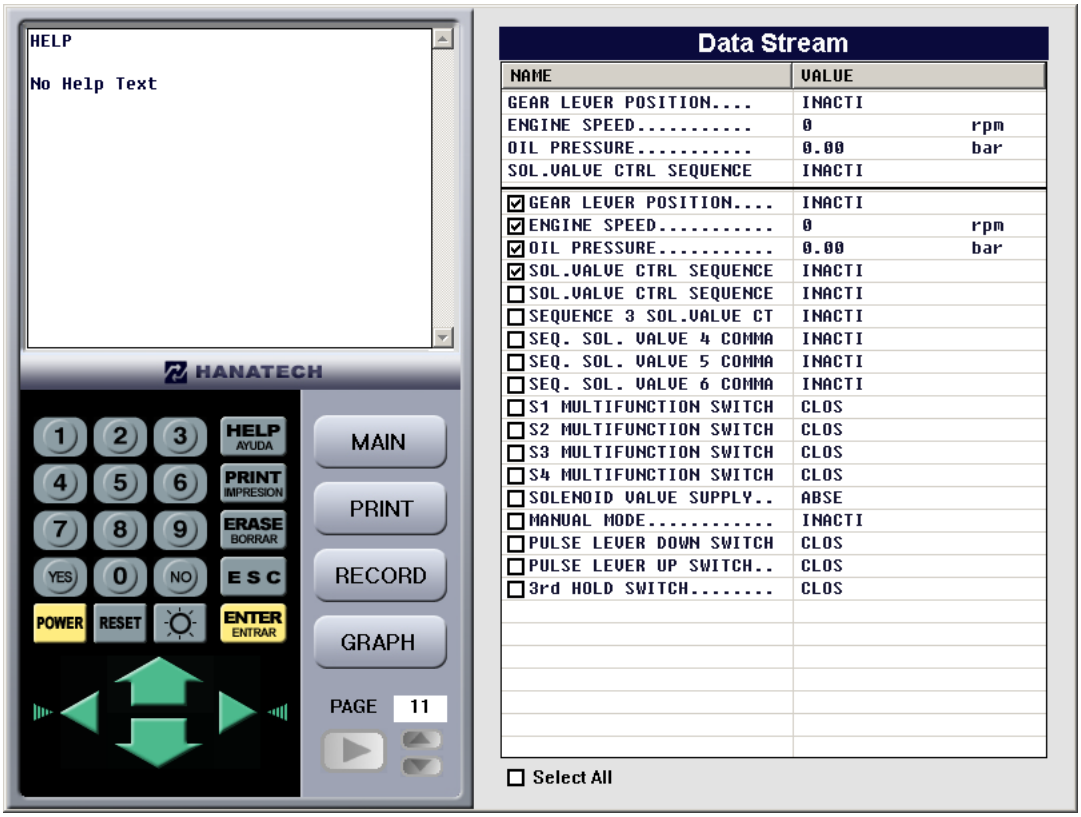


Balckbox function is available with Korean cars. The function is being developed for Japanese and other regional versions, and the update for the expansion of this function is expected to be released on a regular basis. Please contact your local distributor for the availability of the update.

5. Host-Pro

a. By utilizing HOST-PRO realtime PC interface, you can view the live data stream and gas readings on your PC screen. You can also replay the saved balckbox data.

b. Refer to the separate HOST-PRO manual for further information of the functions and features



CHAPTER 7 TROUBLE SHOOTING

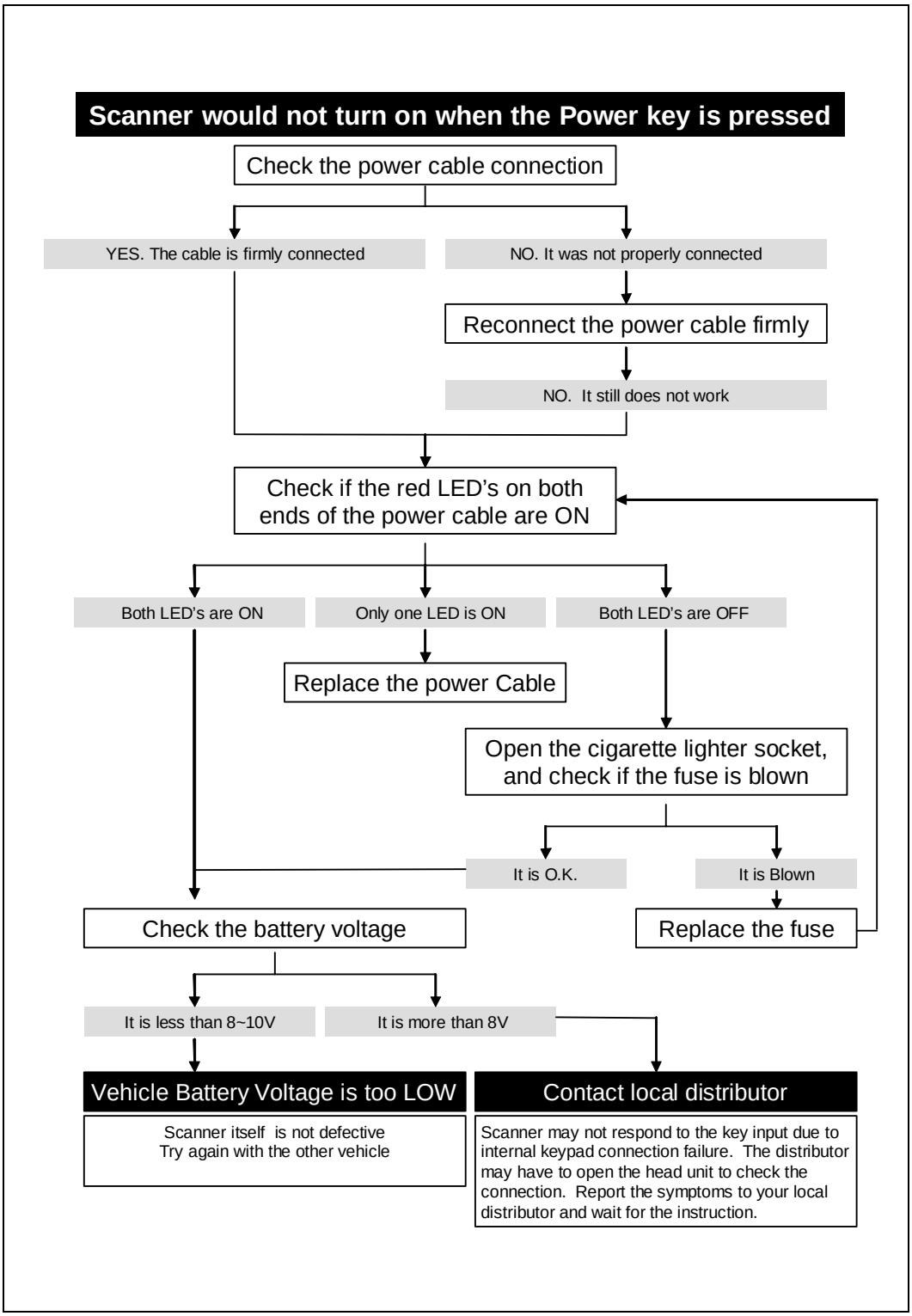
Trouble Shooting

This part of manual presents you the instant actions to be taken for the most frequently reported troubles.
The purpose of this troubleshooting guide is to minimize the loss of time and cost caused by disputing of troubles that can be simply solved by the user himself.

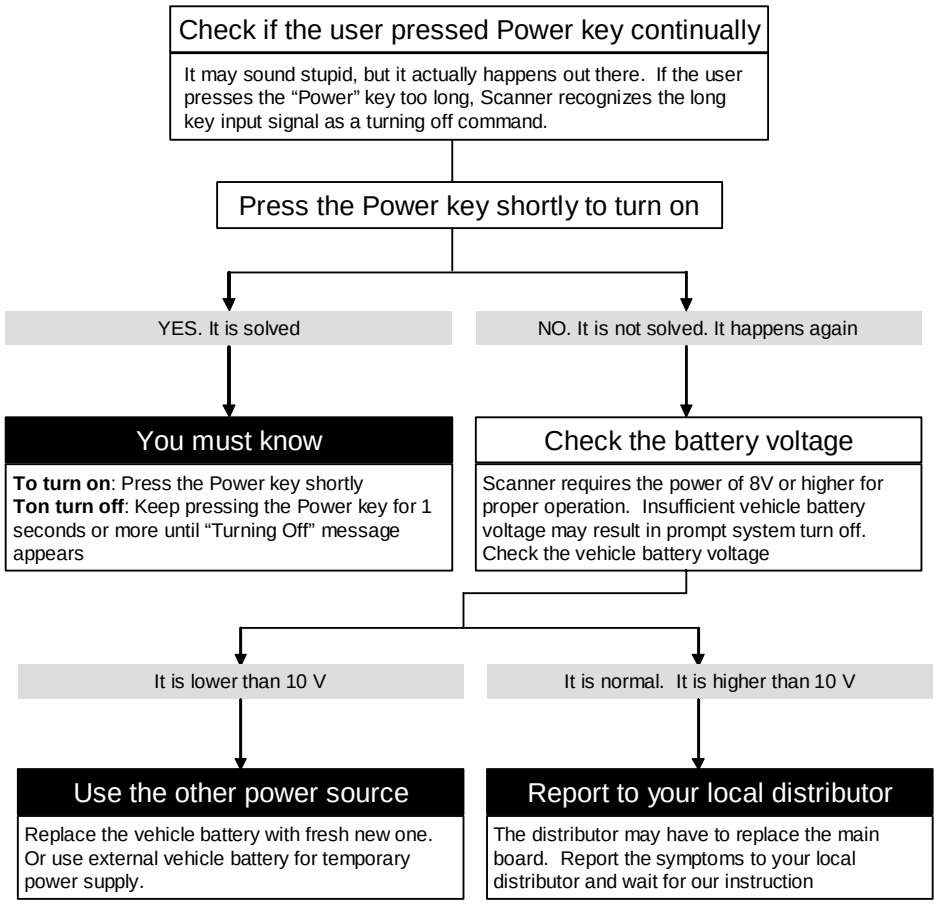
Please always refer to this troubleshooting guide and do as suggested herein when you have any trouble while using MULTISCAN P2 equipment in advance to calling up your local distributor.

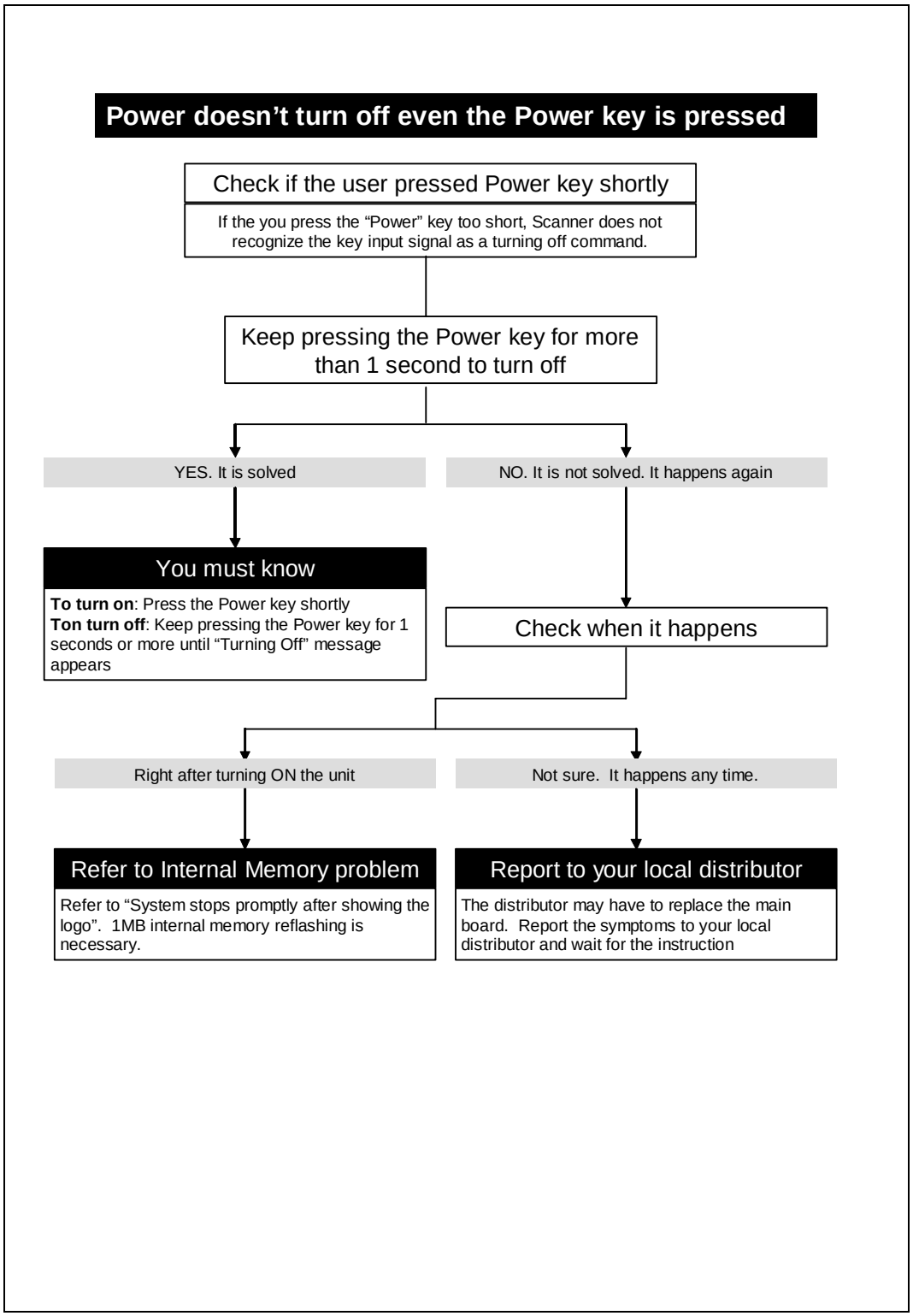
The manufacturer keeps endeavoring to minimize the possible troubles, therefore, remedies to prevent listed problems can be made without notice to individual users.

Note your local distributor's contact information here:

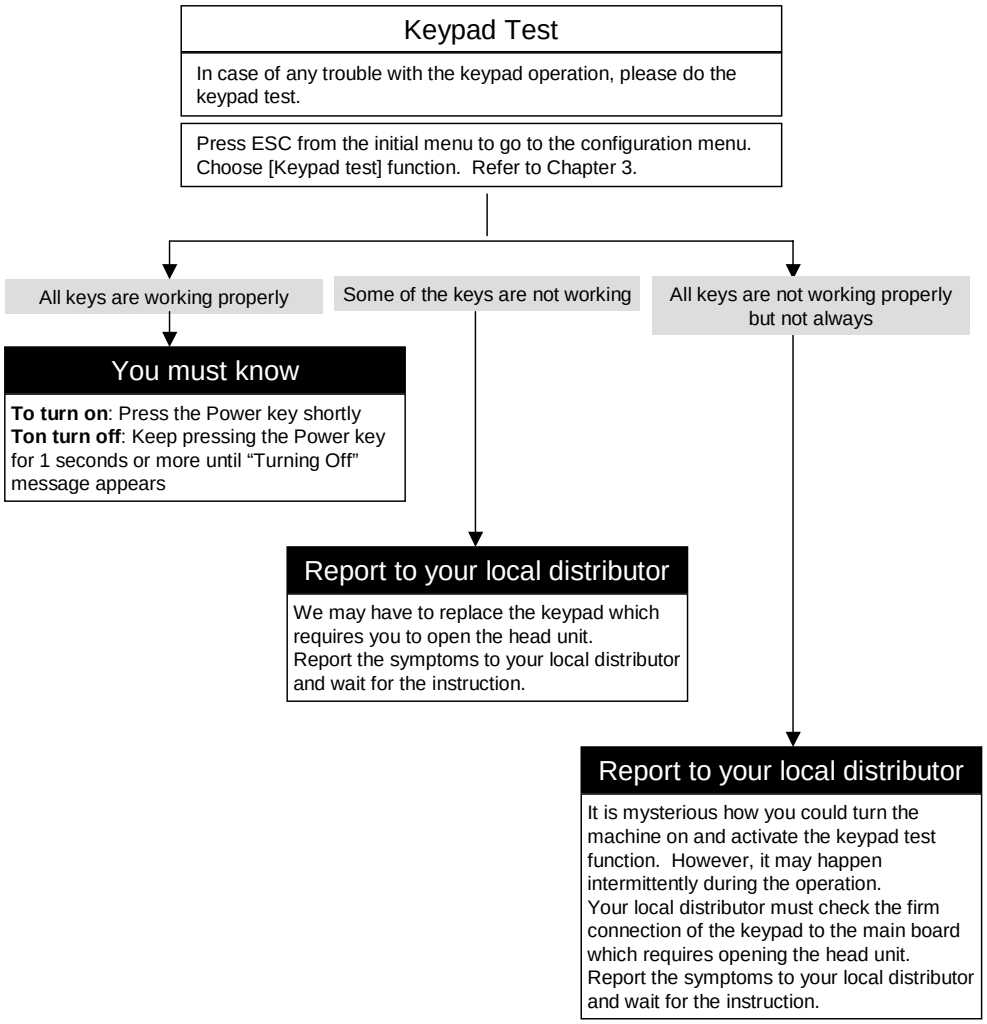

Scanner would not turn on when the Power key is pressed
Check the power cable connection
YES. The cable is firmly connected
NO. It was not properly connected
Reconnect the power cable firmly
NO. It still does not work
Check if the red LED's on both ends of the power cable are ON
Both LED's are ON
Only one LED is ON
Both LED's are OFF
Replace the power Cable
Open the cigarette lighter socket, and check if the fuse is blown
It is O.K.
It is Blown
Replace the fuse
Check the battery voltage
It is less than 8~10V
It is more than 8V
Vehicle Battery Voltage is too LOW
Scanner itself is not defective
Try again with the other vehicle
Contact local distributor
Scanner may not respond to the key input due to internal keypad connection failure. The distributor may have to open the head unit to check the connection. Report the symptoms to your local distributor and wait for the instruction.

Power automatically turns off after turned on




Power doesn't turn off even the Power key is pressed
Check if the user pressed Power key shortly
If the you press the "Power" key too short, Scanner does not recognize the key input signal as a turning off command.
Keep pressing the Power key for more than 1 second to turn off
YES. It is solved
NO. It is not solved. It happens again
You must know
To turn on: Press the Power key shortly
Ton turn off: Keep pressing the Power key for 1 seconds or more until "Turning Off" message appears
Check when it happens
Right after turning ON the unit
Not sure. It happens any time.
Refer to Internal Memory problem
Refer to "System stops promptly after showing the logo". 1MB internal memory reflashing is necessary.
Report to your local distributor
The distributor may have to replace the main board. Report the symptoms to your local distributor and wait for the instruction

Improper response to Key input



LCD screen problems

The display is too dim or too dark

Adjust the contrast using the contrast wheel on the right side of Scanner

LCD stands for Liquid Crystal Display, and it is very sensitive to temperature.

If you have placed Scanner in a cold or hot place, the display may become too dim or too dark when turned on. This is not a defect of Scanner itself, but a normal response of all LCD's to the change of temperature.

This is not a defect of Scanner.

However, if you cannot control the contrast using the dial, please contact us for further assistance.

A part of LCD became very dark

Adjust the contrast using the contrast wheel on the right side of Scanner

The LCD unit of Scanner has a backlight for brighter display. This backlight generates heat as time elapses when turned on.

As mentioned above, because LCD is sensitive to temperature, the part of the LCD near the backlight may turn dark when you keep DCN turned on for more than 2 hours.

This is not a defect of Scanner.

However, if the LCD becomes dark too early or the contrast adjustment doesn't work, please contact us for further assistance.

Report to your local distributor

If the problem is too serious to use properly or the contrast dial does not function, report the symptoms to your local distributor and wait for instruction.
Replacement of the LCD module may be necessary.

LCD screen problems

Backlight doesn't turn on

Press the [Backlight] button

When you press the [Backlight] button marked [☼], the backlight must be turned-on with a faint ticking sound.

Please contact your local distributor for further assistance if the key doesn't work

↓

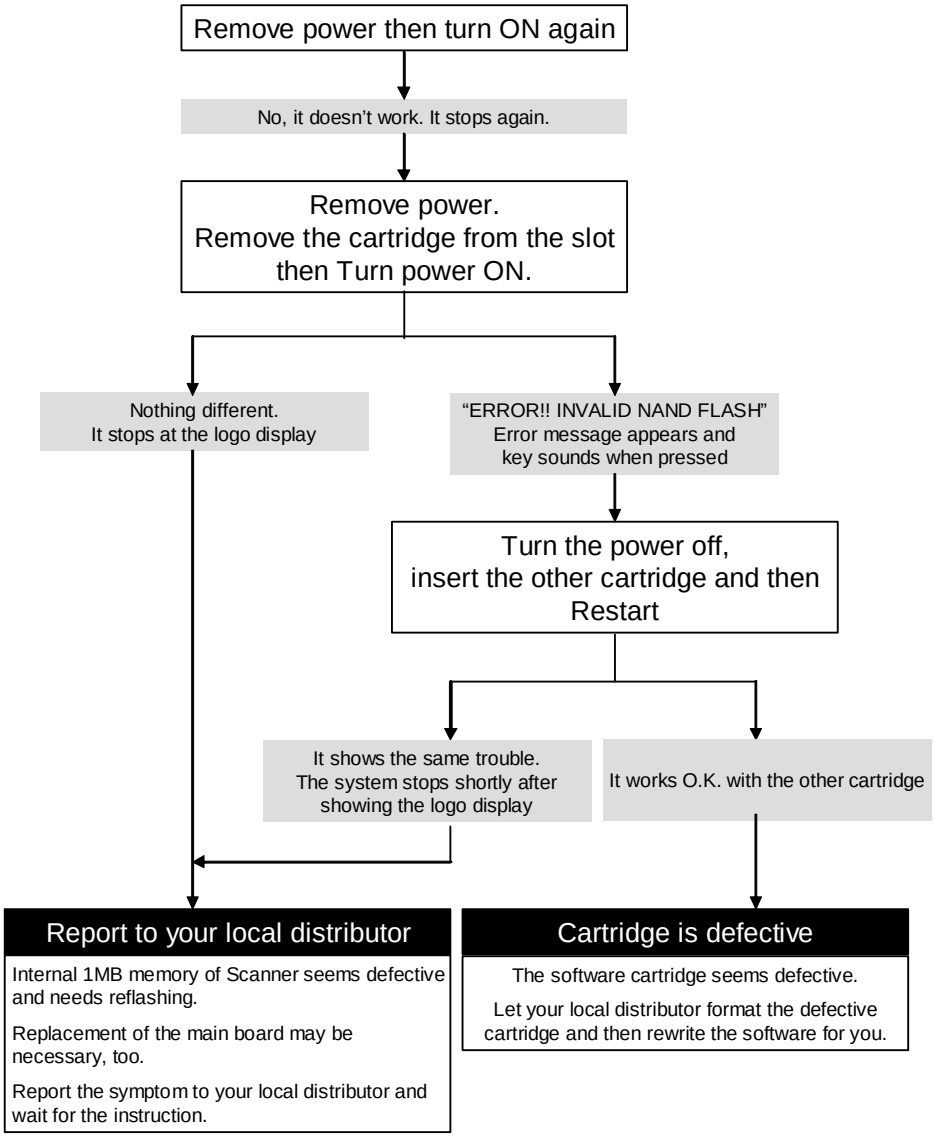
Report to your local disributor

Your local distributor must check the firm connection of the LCD module power wire to the main board, which requires opening the head unit. Or the replacement of the LCD module may be necessary, too.

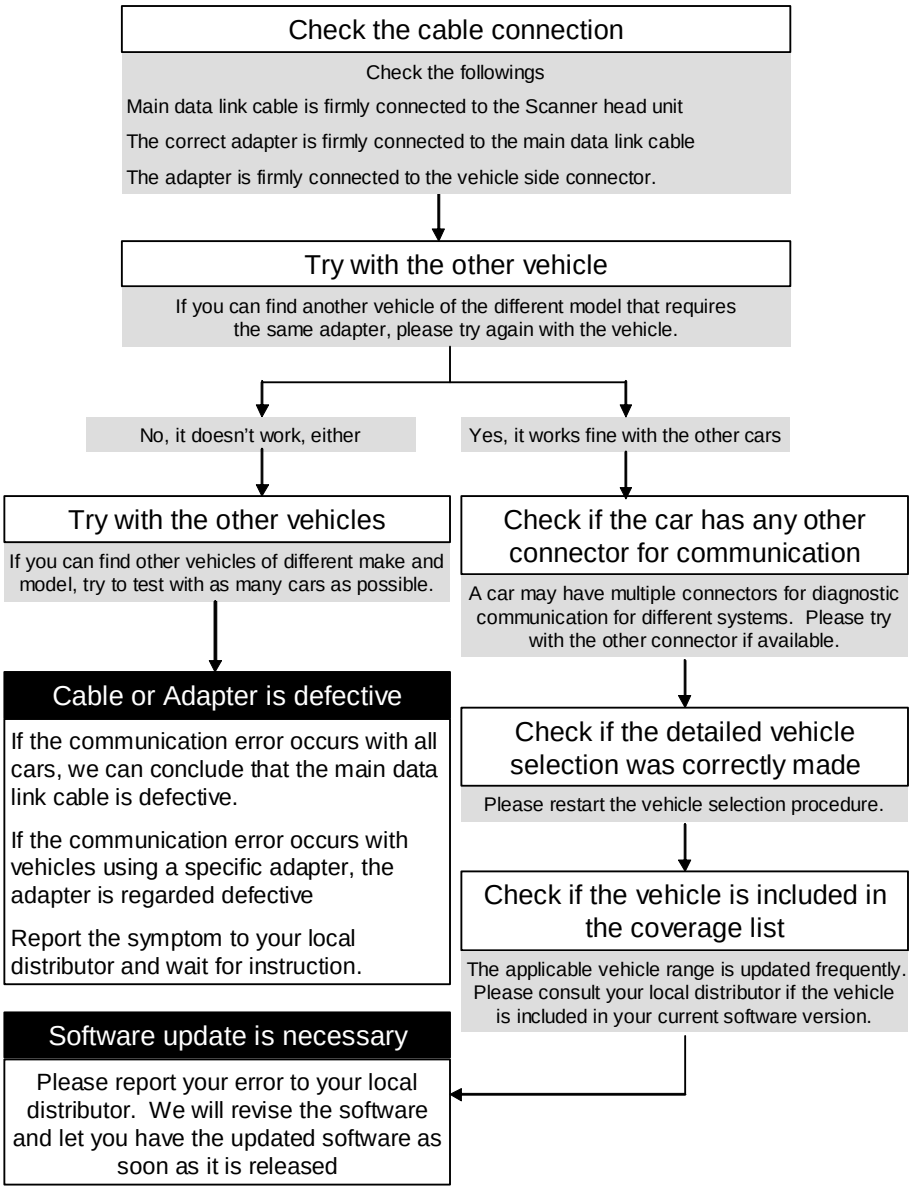
Report the symptoms to your local distributor and wait for the instruction.

System fails promptly after showing brand logo

System fails with continuous BEEP sound and erratic display



Communication Error



USER MANUAL For MULTISCAN P2

Hanatech Co., Ltd.

Automotive Diagnostic Solutions

CE Global Standard

MULTISCAN P2
CE Marked

Hana-B/D, 1032-39, Wonpyeong-dong,
Gumi-si(Gumi city),
Gyeongsangbuk-do(Gyeongbuk),
Korea.
Postal Code: 730 924
Phone: +82-54-454-9009
Fax: +82-54-454-8554

Website: http://www.hanatech.net