

***Hi-scan Pro***

**HYUNDAI                      Intelligent**  
**Scanner**

**CAUTION : Any changes or modifications in construction of This device which is not expressly approved by the party Responsible for compliance could void the user's authority to operate the equipment.**

**NOTE : This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. The limits are designed to provide reasonable protection against harmful interference when the equipment is operated in commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.**

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## SAFETY

### Safety Precautions

**use** This equipment described in this manual is intended for  
only by qualified personnel.

**upon** Safe and effective use of this equipment is dependent  
the operator following normally accepted safety practices  
and procedures in conjunction with the special  
**requirements** detailed in this manual

Specific warning and cautionary statements will be found,  
where applicable, throughout this manual.

**be** Where necessary, the WARNING statements and ICON will  
described this guide.

**damage** WARNING identifies conditions or actions which may  
Hi-Scan Pro or the vehicle.

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**IMPORTANT WARNING MESSAGES FOR SAFETY ARE AS FOLLOWS :**

**DO NOT DROP OFF Hi-Scan Pro MAIN BODY. AND Hi-Scan Pro ALWAYS MUST BE COVERED BY RUBBER SHROUD**

**DO NOT PLACE Hi-Scan Pro ON DISTRIBUTOR. STRONG ELECTRO-MAGNETIC INTERFERENCE CAN MAKE HARMFUL DAMAGE TO Hi-Scan Pro.**

**THE STRONG SURGE OR ELECTRONIC SHOCK IN POWER SUPPLY LINE CAN DAMAGE TO Hi-Scan Pro POWER SUPPLY. DO NOT USE Hi-Scan Pro UNDER THESE DAISY ENVIRONMENT.**

**INPUT VOLTAGE OF OSCILLOSCOPE MUST BE IN RANGE MAX 500 V DC.**

## **UNPACKING**

**The Hi-Scan Pro kit comprises the following standard along with the option kit where ordered.**

**The kit contents should be checked upon receipt and damage or shortages reported to the supplier immediately.**



[ Figure 0.1 : Hi-scan Pro KIT ]

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	PART NO.	PART NAME	vii
1	09910-11000	Hi-scan Pro MAIN BODY	
2	09900-12000	RUBBER SHROUD	
3	09900-21100	DLC CABLE 16	
4	09900-21200	DLC CABLE ADAPTER (16P&12P)	
5	09900-23100	OSCILLOSCOPE PROBE SET	
6	09900-27200	CIGAR LIGHTER CABLE	
7	09900-27210	POWER EXTENSION CABLE	
8	09910-62000	SOFTWARE CARD(16M)	
9	09910-83000	OPERATION GUIDE	
10	09900-27100	RS-232C CABLE	
11	09900-81000	CARRYING CASE	

**1. STANDARD KIT**

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## 2. OPTION KIT

	PART NO.	PART NAME
1	09900-18000	RECHARGEABLE BATTERY SET
2	09900-27300	LINK WIRE For AUTOCHECK-4000 PRINTER
3	09900-42000	MEMORY EXPANSION CARD 1MB(for flight recording)
4	09910-41000	SERIAL PRINTER
5	09900-25200	SECONDARY IGNITION PICK UP (Additional option item)
6	09910-25300	CURRENT PICK UP(1A-600A) (Additional option item)
7	09910-25400	CURRENT PICK UP(50mA-100A (Additional option item)
8	09910-41001	PRINTER CARTIDGE(2PCS)

9	09910-40002	PAPER ROLL FOR PRINTER(3EA)
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### ICON

#### OPERATION LEVEL ICON

: LEVEL 1 OPERATION(INIT LEVEL)

: LEVEL 1 OPERATION(MENU LEVEL)

: LEVEL 1 OPERATION(MODE LEVEL)

#### MESSAGE RELATED ICON

: PROCESS / RESULT MESSAGE

: ERROR MESSAGE

**: WARNING MESSAGE**

**APPLICATION HELP ICON**

**: SCREEN EXPLANATION**

**: OPERATION GUIDE**

**: HELP / TIPS**

**: NOTE**

**PROLOGUE**

***Hi-scan Pro***

# **I. GENERAL INFORMATION**

- 1. GENERAL FEATURES**
- 2. SPECIFICATION**
- 3. FUNCTION CONFIGURATION**
- 4. PARTS DESCRIPTION**

## **I. GENERAL INFORMATION**

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### **1. General Features**

**Hi-scan Pro offers the following functionality:**

- . On board diagnostic communication**
- . Auto set up oscilloscope emulation**
- . Multi-meter emulation**
- . Special vehicle test emulation**

**This combination provides for easy and comprehensive diagnosis of the electronically controlled systems used across the Hyundai model range.**

**Hi-scan Pro feature include :**

- . Diagnostic communication with all Hyundai electronic control systems**

- . OBD-II communication protocol support
- . Two channel digital oscilloscope test
- . Vehicle sensor signal simulation
- . Actuator driving function with predefined frequency and duty ratio
- . Sensor Analysis
- . Symptom analysis
  
- . High resolution LCD display
- . Soft touch key
  
- . On-line support for Diagnostic Trouble Code or Current Data operations via **HELP** key
- . On-line **HELP** key operating guide support

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- . Trouble Tips Card
- . Secondary PCMCIA slot for additional module
- . Large Memory expansion card data storage area for flight recorded data
- . Powerful 16-bit micro-controller
  
- . Shock protecting rubber shroud
- . Rechargeable battery for stand alone operation
  
- . PC communication facility
- . H-Bus for external module
- . Serial printer support
- . PC software down load function

## I. GENERAL INFORMATION

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### 2. General Features

<b>CASING</b>	Dark grey colour High strength ABS material
<b>LCD SPEC.</b>	320 by 240 resolution CCFL Backlight type Standard character output :40 columns 12 Lines
<b>KEYPAD</b>	Power ON /OFF Key, Backlight ON /OFF, Soft Function 6 Keys, Arrow 4 Keys, Fixed Functional 17 Keys Type : Soft Touch Keypad
<b>MEMORY</b>	Application Software Card :



<b>CAPACITY</b>	<b>16 Mbytes Standard Memory Expansion Card : 1 Mbyte</b>
<b>RECHARGEABLE BATTERY</b>	<b>7 EA/Set ( 1100 Ma ) Operating time : 2 Hours Without Backlighting</b>
<b>OPERATION VOLTAGE</b>	<b>8 – 16 VDC INPUT</b>
<b>OPERATING TEMPERATURE</b>	<b>0°C -50°C</b>

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<b>DLC COMMUNI- CATION PART</b>	<b>Hyundai Vehicle All OBD-II (ISO 9141-2) OBD-II (SAE-J1850) KWP-2000</b>
<b>OSCILLOSCOPE</b>	<b>2 Channel 1M Sample / Sec Measuring Voltage : Max 500V Maximum Error Rate : ± 1.5% Input Impedance : 1MOhm</b>
<b>SIMULATOR</b>	<b>8 Bit D/A Converter Output Voltage Range : 0-5V</b>
<b>ACTUATOR</b>	<b>Maximum 1A short to Ground</b>

<b>DRIVER</b>	
<b>ANTI-SHOCK</b>	<b>Rubber Shroud</b>
<b>DIMENSION</b>	<b>Width : 120mm(With upper wings :164mm)</b> <b>Length : 250mm</b> <b>Depth : 50mm (neck part)</b> <b>Weight : 1200g (Main body only)</b>
<b>POWER CONSUMPTION</b>	<b>6 Watts ( Backlight ON),</b> <b>3 Watts ( Backlight IFF)</b>

## I.GENERAL INFORMATION

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### 3. Function configuration

[ Figure I.1 : Hi-scan Pro Function Configuration]

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## **4. Hi-Scan Pro Parts Description**

- (1) Hi-scan Pro MAIN BODY  
( Part No : 09910-11000)

The Hi-scan Pro main body is illustrated in figure I.2.

**[ Figure I.2 : Hi-scan Pro MAIN BODY]**

## **I.GENERAL INFORMATION**

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### **(2) RUBBER SHROUD (Part NO : 09900-12000)**

**The rubber shroud is used to used to protect the main body from damage when in use.**

[ Figure I.3 : RUBBER SHROUD]

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**(2) DLC CABLE 16**  
**(Part no :09900-21100)**

The cable is illustrated in figure I.4 and is used to connect the main body to the diagnosis terminal of vehicles with 16 pin connector vehicles.

[ Figure I.4 : DLC CABLE 16]

## **I. GENERAL INFORMATION**

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### **(4) DLC CABLE ADAPTER 16-12 (Part no : 09900-21200)**

The cable is illustrated in figure 1.5 and interfaces between  
The Hi-scan Pro main body and DLC CABLE 16 when testing  
12 pin connector vehicles.

[ Figure I.5 : DLC CABLE ADAPTER 16-12]

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**(5) CIGAR LIGHTER POWER CABLE**  
**(Part no : 09900-27200)**

The cable is illustrated in figure 1.6 and is used to provided the Hi-scan Pro main body with power from the vehicle cigar light socket.

**[ Figure 1.7 : POWER EXTENSION CABLE]**

## **I. GENERAL INFORMATION**

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### **(6) POWER EXTENSION CABLE**

**(Part no : 09900-27210)**

**The cable is illustrated in figure 1.7 and is used to provide the Hi-scan Pro main body with power directly from the vehicle battery.**



[ Figure 1.7 : POWER EXTENSION CABLE]

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**(7) OSCILLOSCOPE PROBE SET**  
(Part no : 09900-23100)

The probe is illustrated in figure 1.8 and serves to measure signals for the oscilloscope function or multi-meter function, or to supply an output for actuator driving amongst other functions. Following parts are supplied as a set.

[ Figure I.8 : OSCILLOSCOPE PROBE SET]

## **1.GENERAL INFORMATION**

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### **(8) OPERATION GUIDE** **(Part no : 09900-83000)**

**The guide ,illustrated in figure 1.9 provides Hi-scan Pro user Instruction.**

[ Figure I.9 : OPERATION GUIDE]

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**(9) SOFTWARE CARD**  
**(Part no : 09910-62000)**

The card holds the main program required to operate Hi-scan Pro and is illustrated in figure I.10.

[ Figure I.10 : SOFTWARE CARD]

## **I.GENERAL INFORMATION**

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### **(10) RECHARGEABLE BATTERY SET**

**(Part no : 09900-18000)**

**Illustrated in Figure I.11, the optional rechargeable AA size batteries( 7ea./set, 1100mah capacity recommended) provides stand alone power for Hi-scan Pro. AC/DC adapter for battery charging should be sourced locally.**

[ Figure I.11 : RECHARGEABLE BATTERY]

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**(11) RS-232C CABLE**  
(Part no : 09900-27100)

This cable provides a means of connecting Hi-scan Pro to a serial printer or computer and is illustrated in figure I.12.

[ Figure I.12 : RS-232C CABLE]

## **I.GENERAL INFORMATION**

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### **(12) MEMORY EXPANSION CARD –1MB**

**(Part no : 09910-42000)**

Illustrated in figure I.13, the optional expansion card increases the flight recorder data storage capacity of Hi-scan Pro.

[ Figure I.13 : MEMORY EXPANSION CARD]

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**(13) SERIAL PRINTER**  
(Part no : 09900-41000)

The optional serial printer (figure I.14) provides a means of obtaining hard copy output from Hi-scan Pro.

[ Figure I.14 : SERIAL PRINTER]

## **1. GENERAL INFORMATION**

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### **(14) CARRYING CASE** **(Part no : 09900-81000)**

The carrying case illustrated in figure I.15 provides for easy transportation of Hi-scan Pro and protection for the unit when not in use.



[ Figure I.15 : CARRYING CASE]

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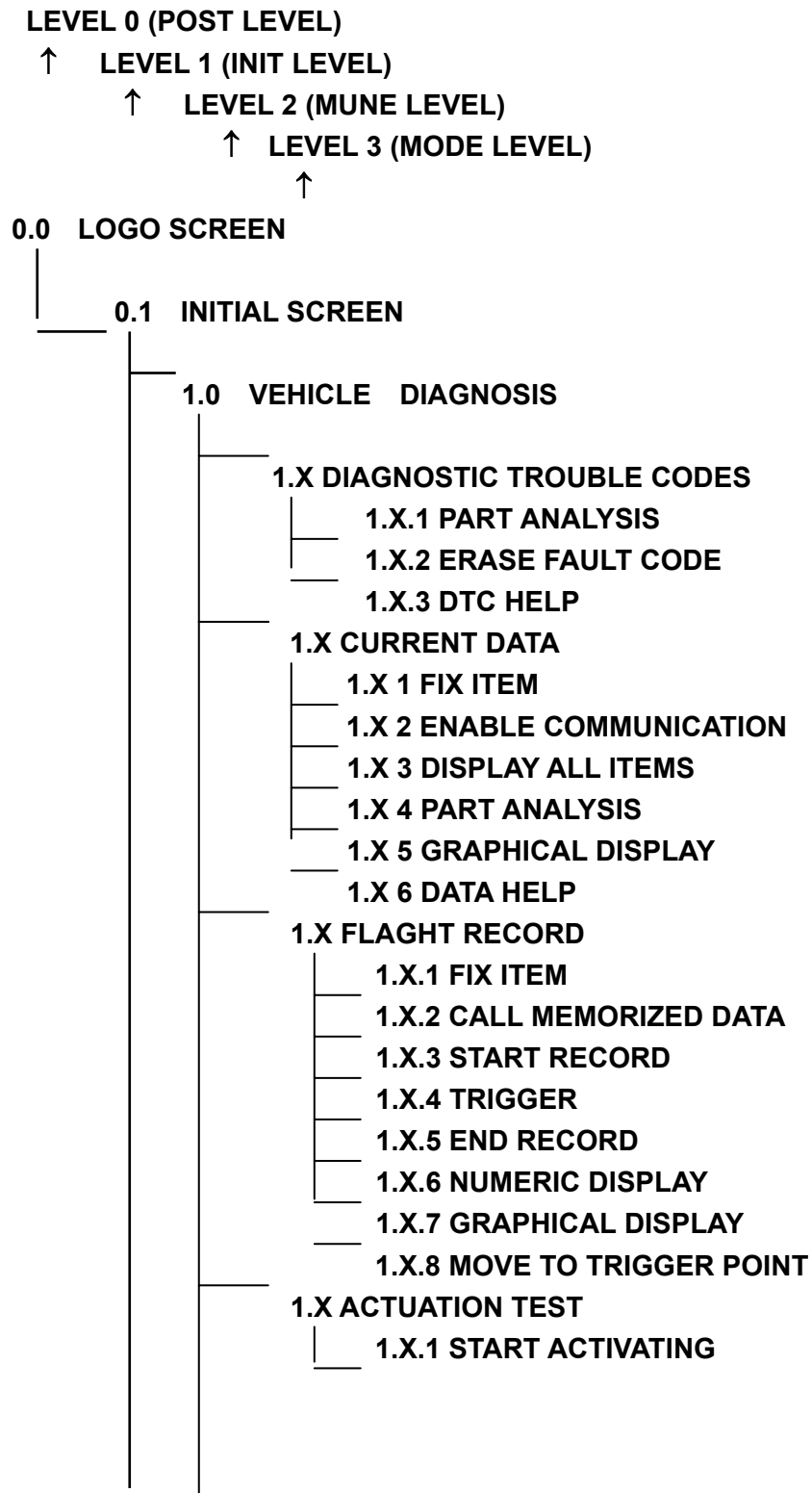
## **II. INTRODUCING HI-scan Pro**

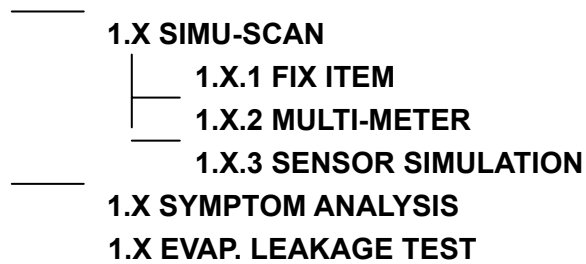
- 1. PROGRAM LEVEL CONFIGURATION**
- 2. OPERATION PRINCIPLE**
- 3. COMPOSITION OF MENU SCREEN**
- 4. MESSAGE DISPLAY**

- 5. POWER SUPPLY**
- 6. INTERNAL BATTERY CHARGING**
- 7. POWER ON/OFF OPERATION**
- 8. INIT LEVEL OPERATION**
- 9. MENU LEVEL OPERATION**
- 10. MODE LEVEL OPERATION**

## **II.INTRODUCING YOUR Hi-scan Pro**

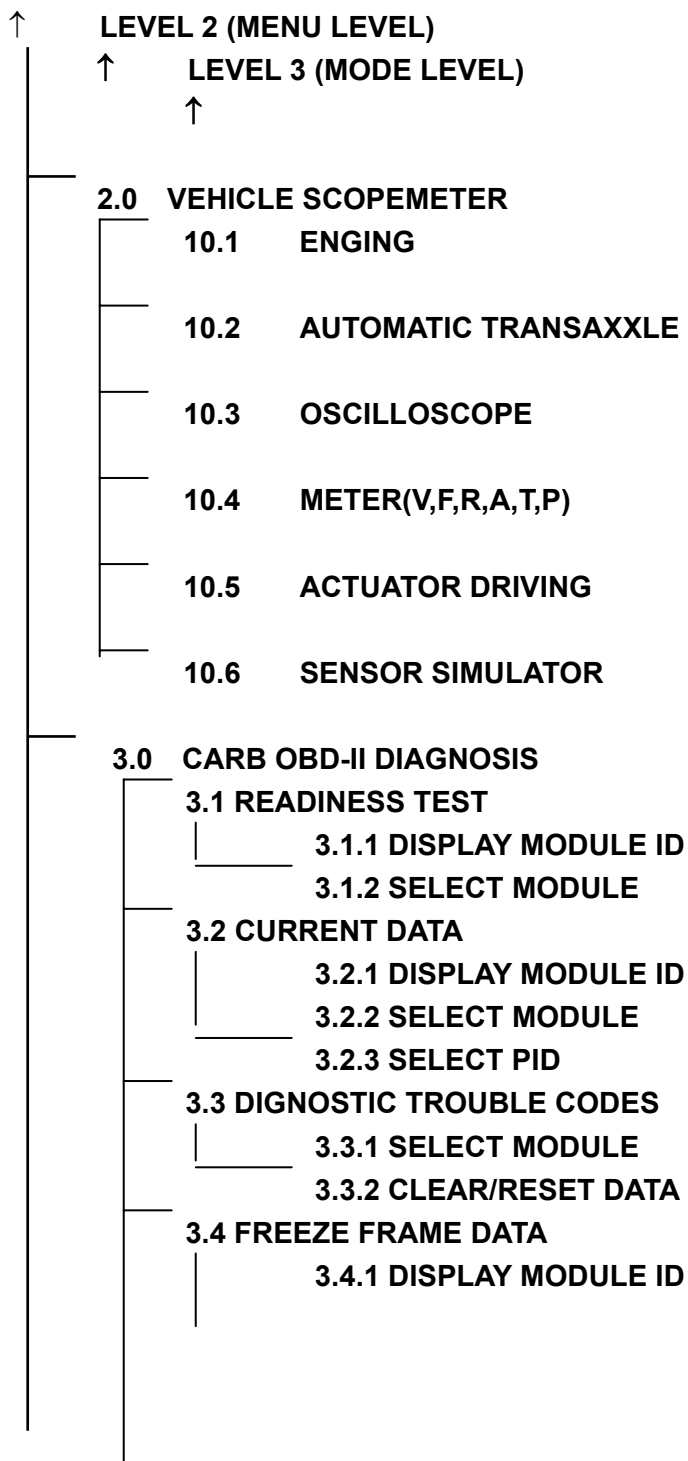
# 1. PROGRAM LEVEL Configuration





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## LEVEL 1 (INIT LEVEL)



	3.4.2 SELECT MODULE
	3.4.3 SELECT PID
3.5 EXPANDED DIAG. PROTOCOL	
	3.5.1 EDIT EDP
	3.5.2 INSERT NEW EDP
	3.5.3 DELETE EDP
	3.5.4 RUN EDP

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LEVEL 1 (INIT LEVEL)	
↑	LEVEL 2 (MENU LEVEL)
	↑
	LEVEL 3 (MODE LEVEL)
	↑
	3.6 O2 TEST RESULTS
	3.6.1 DISPLAY MODULE ID
	3.6.2 SELECT MODULE
	3.6.3 SELECT TEST ID
	3.7 MONITORING TEST RESULTS
	3.7.1 DISPLAY COMPONENT ID
	3.7.2 SELECT TEST ID
	3.8 COMBINATION DISPLAY
	3.8.1 DISPLAY MODULE ID
	3.8.2 CURRENT DATA
	3.8.3 DIAGNOSTIC TROUBLE CODES
	3.8.4 FREEZE FRAME DATA
	3.8.5 O2 TEST RESULTS
	3.8.6 MONITORING TEST RESULTS
	3.9 ECU INFORMATION
	3.10 PENDING DTC
	4.0 FLIGHT RECORD REVIEW

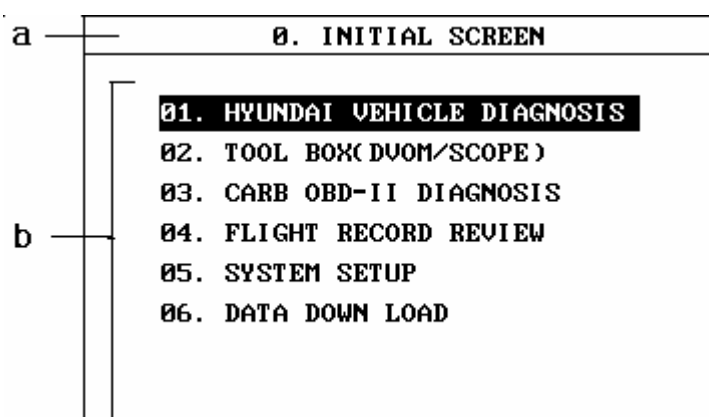
5.0	SYSTEM DETUP
5.1	SYSTEM CONFIGURATION
5.2	DATA SETUP
5.3	PRINTER SETUP
5.4	SYSTEM TEST
5.5.1	KEYPAD TEST
5.5.2	LCD TEST
5.5.3	MEMORY TEST
5.5	METER ZERO SET
6.1	DATA DOWN LOAD

## 2. OPERATION PRINCIPLE

HI-scan Pro operates with an LCD screen to convey Information to the user and a key pad to allow for input.

The basic elements of the screen and key pad are indicated In figure II.1 and figure II.2, with a more detailed description being contained within the following pages.

### (1) LCD PART



**[ Figure II.1 : LCD SCREEN ]**

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Easy to read , LCD screen is separated into 3 major data areas.

Hi-scan LCD screen presents you easy and comfortable operation environment. The screen is divided into three major parts as follows.

**a : CURRENT SCREEN TITLE**

The current screen title indicates the current level or function related information to the operator. The example in figure II.1 indicates:

**[ 0.0 INITIAL SCREEN ]** – this is the current screen description.

**b : MAIN CONTENTS**

The main contents of the screen indicate to the operator which options are currently available for selection. The



example in figure II.1 indicates :

- [ 01. HYUNDAI VEHICLE DIAGNOSIS ]
- [ 02. TOOL BOX(DVOM/SCOPE ]
- [ 03. CARB OBD –II DIAGNOSIS ]
- [ 04. FLIGHT RECORD REVIEW ]
- [ 05. SYSTEM SETUP ]
- [ 06. DATA DOWN LOAD ]

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### c : SOFT FUNCTION KEY DEFINITION

A “ Soft function Key” is one which has a function dictated by the Hi-scan Pro software and which will change according to the particular section of the program being used. The action which will result from the use of a particular soft function key at any given moment is defined by the description given on the screen immediately above the particular soft function key. The example in figure II.1 indicates :

<b>F1.DEF</b>	This segment describes the action resulting from the use of the <span style="border: 1px solid black; border-radius: 50%; padding: 0 5px;">F 1</span> key.
---------------	--

<b>F2.DEF</b>	This segment describes the action resulting
---------------	---

From the used of the **F 2** key.

**F3.DLF**

The segment describes the action resulting from the use of the **F 3** key.

**F4.DEF**

This segment describes the action resulting from the use of the **F 4** key.

**F5.DEF**

This segment describes the action resulting from the use of the **F 5** key.

**F6.DEF**

This segment describes the action resulting from the use of the **F 6** key.

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### (2) KEY PAD

[ Figure II.2 : Hi-scan Pro KEYPAD]

**a : SOFT FUNCTION KEY**

Pressing a soft function key will cause the action described on the screen immediately above that key to occur.

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**b,c : FIXED FUNCTION**

The fixed function keys cause the action described to occur whenever that key is depressed ,regardless of which section of the program is being used. The fixed function key action are described below :

- ON/OFF** Turns on or off power to Hi-scan Pro
- B.LIGHT** Turns on or off LCD display backlight
- SHIFT** Provides additional function when used in conjunction with another fixed conjunction key.

- HELP** Provides user help information relating to current screen
- SHIFT** + **HELP** or **1** Activates print function
- ESC** Return to preceding screen
- UNDO** Cancel Print operation.
- ENTER** Execute selected option/data input etc.
- YES** Input 'yes' response
- N O** Input 'no' response

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### d : NUMERIC KEY

The numeric keys allows for the input of the numeric values Indicated upon the key legend.

### e : DIRECTION CONTROL KEY

Movement of the cursor is controlled by the of the :

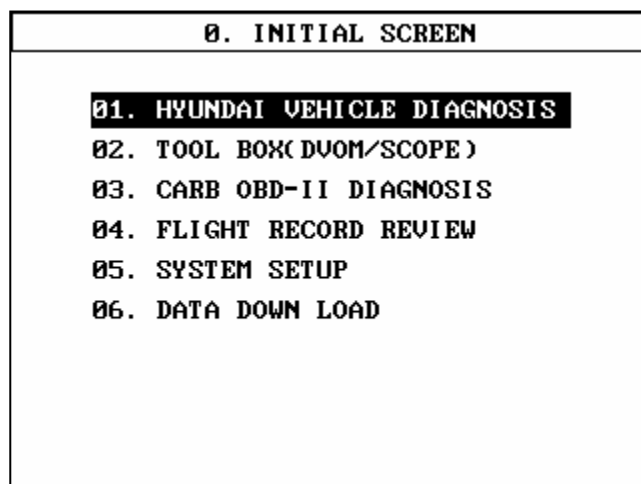
- UP** key for upward cursor movement
- DOWN** key for downward cursor movement
- LEFT** key to move cursor towards the left of the display
- RIGHT** key to move the cursor towards the right of the display

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### 3. COMPOSITION of MENU SCREEN

An example of menu screen is illustrated in figure II.3.



[ Figure II.3 : INTIAL SCREEN ]

A maximum of eight lines will be display on screen , subsequent lines may be viewed by using the **DOWN** key.

The **UP** and **DOWN** keys permit the displayed lines to be paged up or down as required.

To select an item, the cursor should be positioned over the required item which will be displayed in reverse text ( white letters on a dark background ) and the **ENTER** key pressed.

Alternatively, the numeric key corresponding to the menu Item number should be depressed followed by the **ENTER**

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key to perform the selection.

If two or more numeric keys are depressed in succession, only the last two keys depression made before the **ENTER** key is depressed will be selected.

## **4. MESSAGE DISPLAY**

### **1) ERROR MESSAGE**

If an invalid selection is made or an occurs, a message will be displayed within the existing screen and an audible warning will be given.

### **2) PROCESS MESSAGE**

The operation may be informed of the status of a current process by means of a message displayed within the existing screen.

### **3) TIPS / HELP MESSAGE**

Where the **TIPS** or **HELP** key is used and support is available, a message will be displayed the existing screen.

## **5. POWER SUPPLY**

Hi-Scan Pro may be power from one of five sources :

#### **(1) CIGAR LIGHTER POWER CABLE**

Power is obtained from the vehicle cigar lighter socket by means of the above cable. However, power is not available from the cigar lighter socket when the ignition key is at the “OFF” position or when the engine is being cranked.

#### **(2) POWER EXTENSION CABLE**

Power is obtain from the vehicle battery and is available irrespective of the ignition switch position or engine cranking mode.

#### **(3) DLC CABLE**

Vehicles which have OBD-II communication protocol supply power to Hi-scan Pro through the DLC Cable without the need for an additional power supply.

※Note : When you use DLC cable for power supply, please do not use cigar light power cable.

#### **(4) INTERNAL RECHARGEABLE BATTERY**

Where the optional rechargeable batteries are installed, Hi-scan Pro may be operated in dependently of any external power source.

## **II . INTRODUCING YOUR Hi-scan Pro**



**[Figure II .4 : Hi-scan Pro POWER SUPPLY ]**

### **(5) AC/DC ADAPTER**

The locally sourced AC/DC adapter used for recharging the internal batteries ( where specified ) may be used to power Hi-scan Pro whilst battery charging is in progress.

## **6. INTERNAL BATTERY CHARGING**

Where this option is specified, battery charging can be undertaken independently of Hi-scan Pro operation by means of an AC/DC adapter, the DLC cable ( vehicles with OBD-II communication protocol only ) or the cigar lighter power cable.

When the voltage of the internal batteries falls below the specified minimum, Hi –scan Pro will conclude the current processing option (including any necessary data storage) before displaying the following message and turning off the Hi-scan Pro.

<p><b>BATTERY VOLTAGE LOW !</b> <b>RECHARGE BATTERY</b></p>
---

## 7. POWER ON/OFF OPERATION

### (1) OPERATION OF ON/OFF KEY

To turn on Hi-scan Pro, press the **ON/OFF** key. After 0.5 seconds or so, Hi-scan Pro will respond by displaying the opening screen illustrated in figure II.5.

To turn off Hi-scan Pro, it is necessary to depress and hold The **ON/OFF** key for approximately 2second. This prolonged key depression ensures that Hi-scan Pro is not accidentally turned off by accidentally depressing the **ON/OFF**



[ Figure II.5 : SOFTWARE CARD LOGO ]







## 8. INITIAL LEVEL OPERATION (LEVEL 1)

### 8-1. OPERATION FLOW

0.0 LOGO SCREEN

ENTER ↩

0. INITIAL SCREEN
01. HYUNDAI VEHICLE DIAGNOSIS
02. TOOL BOX(DUOM/SCOPE)
03. CARB OBD-II DIAGNOSIS
04. FLIGHT RECORD REVIEW
05. SYSTEM SETUP
06. DATA DOWN LOAD

01		1.0 HYUDAI VEHICLE DAIGNOSIS
02		2.0 TOOL BOX( DVOM/SCOPE )
03		3.0 CARB OBD-II DIAGNOSIS
04		4.0 FLIGHT RECORD REVIEW
05		5.0 SYSTEM SETUP
06		6.0 DATA DOWN LOAD

[Flow II.2 : INITIAL SCREEN]

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### 8-2. Application of INITIAL LEVEL

From this screen, one of the five following options can be Selected by either :

Scrolling until the required option appears in reverse text using the **UP** or **DOWN** keys and pressing **ENTER** or, entering the required option number using the numeric key corresponding to the option number and pressing **ENTER** .

The functions which correspond to each of the options are detailed below :

**01** **ENTER** selects option [1.0 HYUNDAI VEHICLE DIAGNOSIS] menu screen. From this menu, the following options are available:

- 1.1 DIAGNOSTIC TROUBLE CODES mode
- 1.2 CURRENT DATA mode
- 1.3 FLIGHT RECORD mode
- 1.4 ACTUATION TEST mode
- 1.5 SIMU-SCAN mode
- 1.6 SYMPTOM #ANALYSIS mode
- 1.7 EVAP. LEAKAGE TEST

**02** **ENTER** selects option [2.0 TOOL BOX] menu screen. From this menu, the following options are available:

- 2.1 ENGINE
- 2.2 AUTOMATIC TRANSAXLE
- 2.3 OSCILLOSCOPE
- 2.4 METER(V,F,R,A,T,P)
- 2.5 ACTURATOR DRIVING
- 2.6 SENSOR SIMULATOR

**03** **ENTER** selects options [3.0 CARB OBD-II DIAGNOSIS] menu screen. From this menu, the following options are available:

- 3.1 READINESS TEST mode

- 3.2 CURRENT DATA mode
- 3.3 DIAGNOSTIC TROUBLE CODES mode
- 3.4 FREEZE FRAME DATA mode
- 3.5 EXPANDED DIAG. PROTOCOL mode
- 3.6 O2 TEST RESULTS mode
- 3.7 MONITORING TEST RESULTS mode
- 3.8 COMBINATION DISPLAY mode

**04** **ENTER** selects option [ 4.0 FLIGHT RECORD REVIEW] menu screen. This menu allows for the display of the recorded data.

**05** **ENTER** selects option [5.0 SYSTEM SETUP] menu screen.  
From this menu, the following options are available

- 5.1 SYSTEM CONFIGURATION mode
- 5.2 DATA SETUP mode
- 5.3 PRINTER SETUP mode
- 5.4 SYSTEM TEST mode

**06** **ENTER** Cursor movement, data entry etc. may be performed from these and other screens using the FIXED FUNCTION KEYS as indicated in Figure II-2.

On this screen, operation by FIXED keys are available, too.  
FIXED key operation is commonly available for the whole screen, of which explanation will be omitted for further screen operation accordingly.

## 9. MENU LEVEL OPERATION

### (LEVEL 2)

#### 9-1. OPERATION FLOW

0.0 INITIAL SCREEN

01



<b>1. HYUNDAI VEHICLE DIAGNOSIS</b>
MODEL : SONATA 99-2001MY ALL
SYSTEM : ENGINE L4-DOHC
OBD-II
<b>01. DIAGNOSTIC TROUBLE CODES</b>
02. CURRENT DATA
03. FLIGHT RECORD
04. ACTUATION TEST
05. SIMU-SCAN
06. SYMPTOM ANALYSIS
07. EVAP. LEAKAGE TEST

01



1.1 DAIGNOSTIC TROUBLE CODES

02



1.2 CURRENT DATA

03



1.3 FLIGHT RECORD

04



1.4 ACTUATION TEST

05



1.5 SIMU-SCAN

06



1.6 SYMPTOM ANALYSIS

07



1.7 EYAP. LEAKAGE TEST



## **9-2 APPLICATION OF MENU LEVEL**

(HYUNDAI VEHICLE DIAGNOSIS MENU example)

- 01** Selects [1.1 DIAGNOSTIC TROUBLE CODES] mode which will display any diagnosis codes which are being stored within the selected ECM.
- 02** Selects [1.2 CURRENT DATA] mode where sensor values from the selected ECM are displayed.
- 03** Selects [1.3 FLIGHT RECORD] mode, a function which allows Hi-Scan Pro to continuously collect and analyze vehicle data.
- 04** Selects [1.4 ACTUATION TEST ] mode to allow various actuators to be driven by Hi-Scan Pro.
- 05** Selects [1.5 SIMU-SCAN] mode to allow multimeter and sensor simulation functions to be performed while observing current data.
- 06** Selects [1.6 EVAP. LEAKAGE TEST] mode to allow diagnosis troubles of evaporation, leakage.
- 07** Selects [1.7 SYMPTOM ANALYSIS] mode to allow diagnosis of various symptoms of vehicle troubles.

## 10. MODE LEVEL OPERATION (LEVEL 1)







### 10-1. OPERATION FLOW

#### 1.0 HYUNDAI VEHICLE DIAGNOSIS

02



1.2 CURRENT DATA			
11.OXYGEN SENSOR	332	mV	▲
12.MASS.AIR FLOW SNSR	1367	mV	■
13.INT.AIR TEMP.SNSR	129	°F	
14.THROTTLE P.SENSOR	742	mV	
16.BATTERY VOLTAGE	14.2	V	
18.CRANKING SIGNAL	OFF		
21.COOLANT TEMP.SNSR	192	°F	
22.ENGINE SPEED	812	rpm	▼
FIX	SCRN	FULL	PART
GRPH	HELP		

<b>FIX</b>		<b>1.1.1 FIX ITEM</b>
<b>SCRN</b>		<b>1.1.2 ENABLE COMMUNICATION</b>
<b>FULL</b>		<b>1.1.3 DISPLAY ALL ITEMS</b>
<b>PART</b>		<b>1.1.4 PART ANALYSIS</b>
<b>GRPH</b>		<b>1.1.5 GRAPHICAL DISPLAY</b>
<b>HELP</b>		<b>1.1.6 DATA TIPS</b>

[Flow II.3 : CURRENT DATA MODE IN/OUT FLOW]

## *Hi-scan Pro* OPERATION GUIDE

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### 10-2.APPLICATION OF MODE LEVEL (CURRENT DAT Mode example)

At the Mode level screen, the following soft function key options offer access to advanced applications:

**FIX** executes the [1.1.1 FIX ITEM] function which moves the item in reverse text to the top of the display. This item is held and does not move when the cursor keys are used to page through the display and therefore allows specific items to be compared directly to one another. The fixed item is identified by an asterisk.

**SCRN** executes the [1.1.2 ENABLE COMMUNICATION] function which subsequently allows selection of the specific component required.

**FULL** executes the [ 1.1.3 DISPLAY ALL ITEMS]

function which displays a maximum of 22 data items in an abbreviated format on the screen.

**PART** is used to diagnose the sensor condition precisely.

**GRPH** executes the [1.1.5 GRAPHICAL DISPLAY] function causing the selected data to be displayed as a graph. The data selection is made by using the FIX key.

**HELP** executes the [1.1.6 DATA TIPS] which displays shooting trouble information for the selected item.

## II . INTRODUCING YOUR Hi-scan Pro

***Hi-scan Pro***

## **III. HYUNDAI VEHICLE DIAGNOSIS**

- 1. CONNECTION METHOD**
- 2. VEHICLE AND SYSTEM SELECTION**
- 3. DIAGNOSTIC TROUBLE CODES**
- 4. CURRENT DATA**
- 5. FLIGHT RECORD**
- 6. ACTUATION TEST**
- 7. SIMU-SCAN**
- 8. SYMPTOM ANALYSIS**
- 9. EVAP. LEAKAGE TEST( OBD-II ONLY )**

## **2. CONNECTION METHOD**

**For vehicles with 16 pin Data Link Connector power is supplied from the DLC terminal through the DLC CABLE. An additional power supply is not needed. For these vehicles, connection of the DLC CABLE 16 to the Hi-scan Pro and the vehicle data link terminals is all that is required.**

**However, only the latest generation of vehicles use the 16-pin Data Link Connector. For earlier models, a separate power supply by means of the cigar lighter cable, and battery extension cable will be required.**

**Once the power supply has been connected, the DLC CABLE 16 should be connected to Hi-scan Pro data link terminal and the DLC CABLE ADAPTER 16-12 connected to the vehicle data link terminal and the DLC CABLE 16.**

[ *Figure III.1 :HYUNDAI VEHICLE DIAGNOSIS*  
MODE CONNECTION ]

### III. HYUNDAI VEHICLE DIAGNOSIS



### 3. VEHICLE AND SYSTEM SELECTION

#### 2-1. OPERATION FLOW

##### 0.1 INITIAL SCREEN

##### 01. VEHICLE DIAGNOSIS

ENTER



1. HYUNDAI VEHICLE DIAGNOSIS ▼		
03. ACCENT	95-99MY	ALL
04. EXCEL	90-94MY	ALL
05. SCOUPE	91-96MY	ALL
06. ELANTRA	2001MY	ALL
07. ELANTRA	96-2000MY	ALL
08. ELANTRA	92-95MY	ALL
09. HD COUPE	97-2001MY	ALL
10. SONATA	99-2001MY	ALL

ENTER



1. HYUNDAI VEHICLE DIAGNOSIS		
MODEL	: SONATA	99-2001MY ALL
01. ENGINE L4-DOHC		
02. ENGINE V6-DOHC		
03. AUTOMATIC TRANSAXLE		
04. ANTI-LOCK BRAKE SYSTEM		
05. SRS-AIRBAG		
06. TRACTION CONTROL SYSTEM		
07. IMMOBILIZER		

**ENTER** ↩

<b>1. HYUNDAI VEHICLE DIAGNOSIS</b>	
<b>MODEL :</b>	<b>SONATA 99-2001MY ALL</b>
<b>SYSTEM :</b>	<b>ENGINE L4-DOHC</b>
<b>01. UNLEAD</b>	<b>ALL</b>
<b>02. UNLEAD</b>	<b>IMM</b>
<b>03. LEAD</b>	<b>ALL</b>
<b>04. OBD-II</b>	

[FLOW III.1 : VEHICLE AND SYSTEM SELECTION SUB-MENU  
IN/OUT FLOW ]

## 2-2. BASIC APPLICATION

Having connected and turned on Hi-scan Pro, the vehicle and systems 1 and 2 selections must be made from the [ 1.0 HYUNDAI VEHICLE DIAGNOSIS] screen.

The support functions differ from vehicle to vehicle and therefore the correct selection must be made. Selection may be made by scrolling up or down the screen and pressing **ENTER** , or by using the numeric keypad to select the appropriate option number and pressing **ENTER** .

Selection is made in the order of VEHICLE, SYSTEM 1, SYSTEM 2.

### III. HYUNDAI VEHICLE DIAGNOSIS

### 3. DIAGNOSTIC TROUBLE CODES

#### 3-1. OPERATION FLOW

01. INITIAL SCREEN



01

VEHICLE AND SYSTEM SELECTION



Refer to “Selecting Vehicle Mode”

DIAGNOSTIC TROUBLE CODES

ENTER



1.1 DIAGNOSTIC TROUBLE CODES	
P0132	02 SNSR-HIGH VOLT.(B1/S1)
P0135	02S HEATER CIRCUIT(B1/S1)
P0136	02 SNSR CIRCUIT-MAL(B1/S2)
P0139	02 SNSR SLOW RESPO.(B1/S2)
P0140	02 SNSR NO ACTIVITY(B1/S2)
NUMBER OF DTC : 5 ITEMS	
PART	ERAS
HELP	

PART



1.1.1 PART ANALYSIS

ERAS



1.1.2 ERASE FAULT CODE

HELP



1.2.3 DTC TIPS

[ FLOW III.2 : DIAGNOSTIC TROUBLE CODES IN/OUT FLOW]

### 3-2. MODE APPLICATION

At this level, diagnostic trouble codes (DTC) are displayed for the selected ECM

Whenever the screen is opened or refreshed, the cursor moves to the beginning of the display and an audible warning will be given along with the number and description of the component from which the code has been generated.

By using the **UP** / **DOWN** key, the display may be scrolled.

#### **PART**

This soft function key is used in diagnosis troubles sensor precisely. Part mode provides more effective ways to diagnosis vehicle's problem comparing reference waveform with various bad signals,

#### **ERAS**

This soft function key will clear the **DTC** currently held in the memory of the selected ECM. If this option is selected, a message requesting confirmation of the **ERAS** request will be displayed. The **YES** or **NO** key should be used to confirm or cancel the request to clear the current DTC.

#### **HELP**

With selecting **HELP** key, you can see standard **WAVE FORM**, **HELP**, **CIRCUIT DIAGRAM**, **FLOW**, **CASE**. If there is no these function for certain item, you will see below message.

**NO TIPS. FOR MORE INFORMATION,  
REFER TO THE SHOP MANUAL**

1.1 DIAGNOSTIC TROUBLE CODES			
P0132 02 SNSR-HIGH VOLT.(B1/S1)			
P0135 02S HEATER CIRCUIT(B1/S1)			
P0136 02 SNSR CIRCUIT-MAL(B1/S2)			
P0139 02 SNSR SLOW RESPO.(B1/S2)			
P0140 02 SNSR NO ACTIVITY(B1/			
NUMBER OF DTC : 5 ITE			TIPS
			WAVE
			CASE
			CIRT
			FLOW
PART	ERAS		HELP

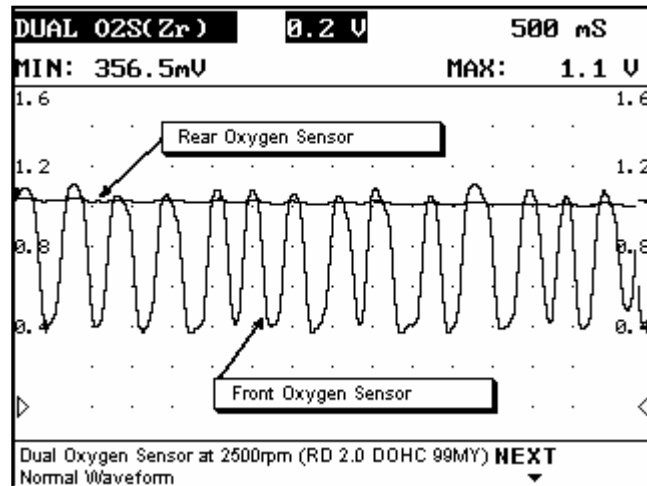
[ Figure III.2 : DTC HELP MODE ]

**TIPS** This function provides you repair guide like [figure III.3]

11. OXYGEN SENSOR
* TEST CONDITION - Engine: Warm-up * SERVICE STANDARD - When decelerating suddenly from 4,000rpm: 200mv or less - When engine is suddenly reced: 600 - 1,000mv - Engine is idling or 2,500 r/min: 400mv or less <-> 600-1,000mv(Changes) - Inspect the waveform of oxygen sensor with oscilloscope

[ Figure III.3 : DTC HELP TIPS MODE(TIPS)]

**WAVE** This function provides you standard waveform like [figure III.4]



[ Figure III.4 : DTC HELP MODE(WAVE) ]

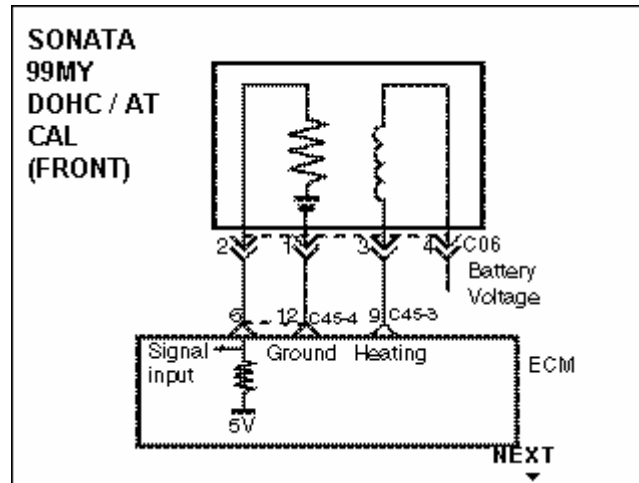
**CASE** This function provides you case study like [figure III.5]

11.OXYGEN SENSOR	CASE
<b>Normal Oxygen Sensor Behavior A good</b> Low RPM Hesitation Slight Engine Surge Poor Gas Mileage Stumble From Idle, Poor Gas Mileage	front oxygen sensor will fluctuate above and below 500 mV(not considering a voltage offset if present) (1998 Elantra shown). The signal should give a smooth transition from above to below the 500mV target value. A voltage above 500mV indicates a rich condition, which triggers the ECM to lean the air/fuel mixture. The oxygen sensor voltage drops as a result. Once the voltage drops below 500 mV, the ECM enriches the air/fuel mixture due to the lean condition. The oxygen sensor voltage rises as a result. This cycle happens continuously which results in the oscillating oxygen sensor waveform. The rear O2 sensor follows the same basic fluctuations as the front, but should indicate very little variation. The rear O2 sensor analyzes the exhaust gasses leaving the catalytic converter.

[ Figure III.5 : DTC HELP MODE(CASE)]

CIRT

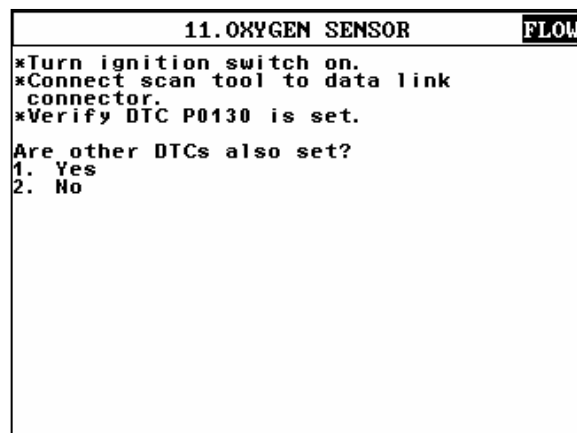
This function provides you circuit diagram like [figure III.6]



[ Figure III.6 : DTC HELP MODE(CIRT)]

FLOW

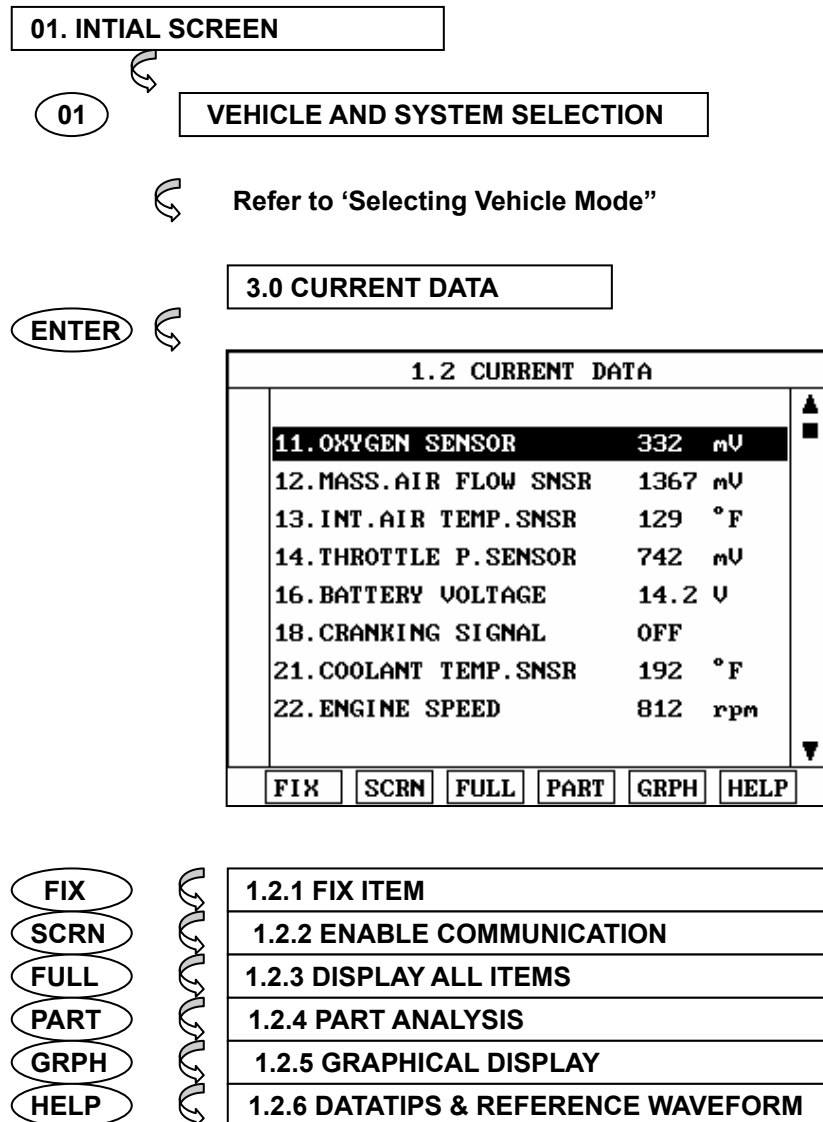
0| This function provides you flow like [figure III.7]



[ Figure III.7 : DTC HELP MODE(FLOW) ]

## 4. CURRENT DATA

### 4-1. OPERATION FLOW



[ FLOW III.3 : CURRENT DATA MODE IN/OUT FLOW ]



## 4-2. MODE APPLICATION

The sensor values and the ON/OFF state of the system switches of the selected ECM are displayed.

Scrolling up and down the date is possible by means of the **UP** / **DOWN** keys and more detailed data is available by Using the soft function keys as follows :

## FIX

Executing the [I.2.I FIX ITEM] function which moves the item in reverse text to the top of the display. This item is held and does not move when the cursor keys are used to page through the display and therefore allows specific items to be compared directly to one another. And this key will change the number of example, only 2sensors are 'live', the rate at which Hi-scan Pro updates the display data will be faster than where a higher number of 'live' items is selected. The fixed item is identified by an asterisk.

1.2 CURRENT DATA					
✖	11.OXYGEN SENSOR	468	mV		
	12.MASS.AIR FLOW SNSR	1347	mV		
	13.INT.AIR TEMP.SNSR	129	°F		
	14.THROTTLE P.SENSOR	742	mV		
	16.BATTERY VOLTAGE	14.1	V		
	18.CRANKING SIGNAL	OFF			
	21.COOLANT TEMP.SNSR	192	°F		
	22.ENGINE SPEED	812	rpm		
FIX	SCRN	FULL	PART	GRPH	HELP

**[ Figure III.8 : FIX ITEM ]**

A fixed item may be released by depressing the **FIX** key again.

In the example illustrated by figure III.8, ( OXYGEN SENSOR ) is fixed as denoted by the asterisk to the left of the item number.

**SCRN** Pressing this key will change the number of displayed sensors or switch states which are 'live' between 8(max), 4 or 2(min). Where only 2 sensors are 'live', the rate at which the Hi-scan Pro updates the display data will be faster than where a higher number of 'live' items is selected. In the example illustrated by figure III. , only 2 'live' data items are selected/

1.2 CURRENT DATA		
11.	OXYGEN SENSOR	253 mV
12.	MASS.AIR FLOW SNSR	1347 mV
13.	INT.AIR TEMP.SNSR	
14.	THROTTLE P.SENSOR	
16.	BATTERY VOLTAGE	
18.	CRANKING SIGNAL	
21.	COOLANT TEMP.SNSR	
22.	ENGINE SPEED	

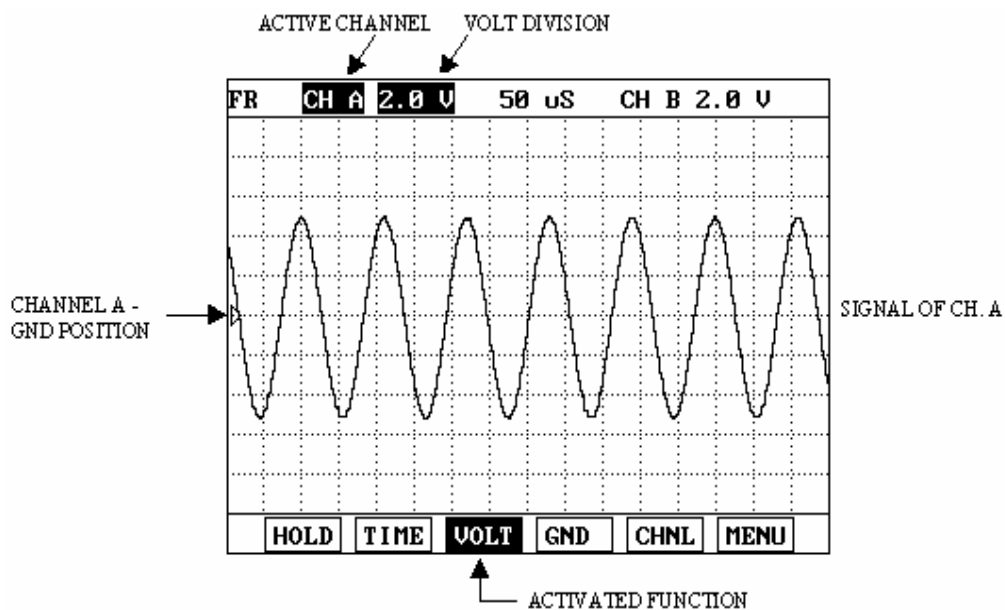
[ Figure III.9 : SCRN ITEM ]

**FULL** Use of this key will cause maximum 22 data value to be displayed on the screen as illustrated in figure III.10.The component description displayed will be abbreviated when this mode is used. The data may be scrolled by use of the **UP** / **DOWN** key.

1.2 CURRENT DATA			
O2S	136	mV	A/C SWITCHOFF
MAF SENSOR	1308	mV	TR. SWITCH P, N
IAT SENSOR	132	°F	ENG. LOAD 41.9 %
TP SENSOR	742	mV	INJECTION 2.0 mS
BATT. VOLT	14.1	V	IGN. TIMING BTDC 9 °
CRANK SIG.	OFF		ISC DUTY 35.2 %
ECT SENSOR	203	°F	A/C RELAY OFF
ENG. SPEED	812	rpm	O2S-REAR 19 mV
USS	0	MPH	CLOSE LOOP CLSD LOOP
CTP SWITCH	ON		LONG-TERM -7.0 %
PSP SWITCH	OFF		SHORT-TERM -2.3 %

[ Figure III.10 : DISPLAY ALL ITEMS ]

**PART** This soft function key is used in diagnosis troubles sensor precisely. Supplying TIPS and reference waveforms enable precise trouble diagnosis.



[ Figure III.11 : PART ANALYSIS ]

As illustrated by figure III.11, connect the oscilloscope cable on the defective sensor and diagnose the waveform of the trouble sensor.

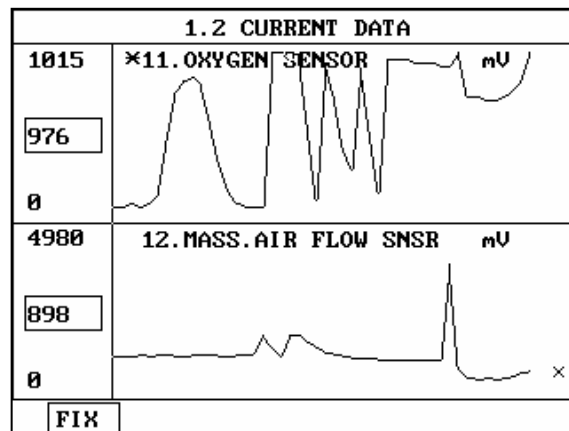
In the part analysis mode, pressing the HELP key displays tips, right waveforms, trouble code examples, and the circuit of the selected sensor.

**GRPH**

Where more 2 'live' data items have been selected using the **FIX** key, pressing the **GRPH** key will cause the data for those items to be displayed in the form of a graph as illustrated in figure III.12.

**FIX**

Holding one item of two. When the **UP** / **DOWN** keys are used to scroll up and down the display, the item selected by **FIX** key does not move.



[Figure III.12 : CURRENT DATA (GRPH)]

**HELP**

With selecting **HELP** key, you can see standard **WAVE FORM**, **HELP**, **CIRCUIT DIAGRAM**, **FLOW**, **CASE**. If there is no these function for certain item, you will see below message.

**NO TIPS. FOR MORE INFORMATION,  
REFER TO THE SHOP MANUAL**

1.2 CURRENT DATA		
11.OXYGEN SENSOR	332	mV
12.MASS.AIR FLOW SNSR	1367	mV
13.INT.AIR TEMP.SNSR	129	°F
14.THROTTLE P.SENSOR	742	mV
16.BATTERY VOLTAGE	14.2	
18.CRANKING SIGNAL	OFF	
21.COOLANT TEMP.SNSR	192	
22.ENGINE SPEED	812	
TIPS		
WAVE		
CASE		
CIRT		
FLOW		
FIX	SCRN	FULL
PART	GRPH	HELP

[ Figure III.13 : CURRENT DATA HELP MODE ]

**TIPS**

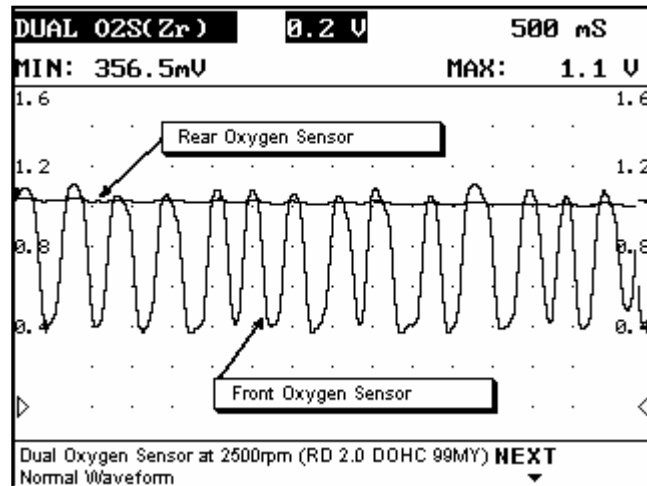
This function provides you repair guide like [figure III.14]

11. OXYGEN SENSOR
* TEST CONDITION - Engine: Warm-up * SERVICE STANDARD - When decelerating suddenly from 4,000rpm: 200mv or less - When engine is suddenly reced: 600 - 1,000mV - Engine is idling or 2,500 r/min: 400mV or less <-> 600-1,000mV(Changes) - Inspect the waveform of oxygen sensor with oscilloscope

[ Figure III.14 : DTC TIPS MODE ]

**WAVE**

This function provides you standard waveform like [figure III.15]



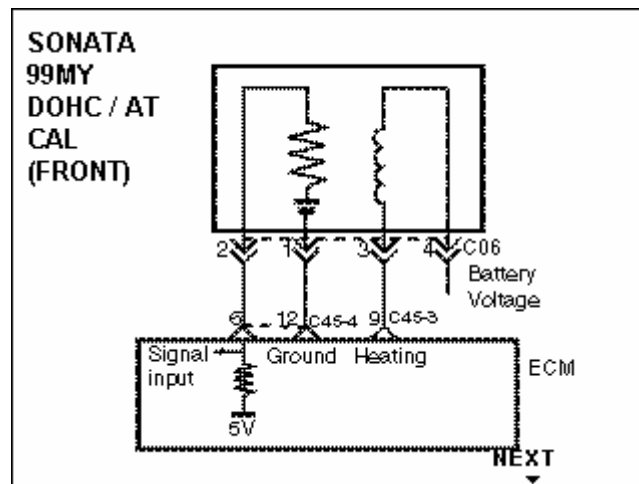
[ Figure III.15 : DTC WAVE MODE ]

**CASE** This function provides you case study like [figure III.16]

11.OXYGEN SENSOR	CASE
<b>Normal Oxygen Sensor Behavior A good</b> Low RPM Hesitation Slight Engine Surge Poor Gas Mileage Stumble From Idle, Poor Gas Mileage	front oxygen sensor will fluctuate above and below 500 mV(not considering a voltage offset if present) (1998 Elantra shown). The signal should give a smooth transition from above to below the 500mV target value. A voltage above 500mV indicates a rich condition, which triggers the ECM to lean the air/fuel mixture. The oxygen sensor voltage drops as a result. Once the voltage drops below 500 mV, the ECM enriches the air/fuel mixture due to the lean condition. The oxygen sensor voltage rises as a result. This cycle happens continuously which results in the oscillating oxygen sensor waveform. The rear O2 sensor follows the same basic fluctuations as the front, but should indicate very little variation. The rear O2 sensor analyzes the exhaust gasses leaving the catalytic converter.

[ Figure III.16 : DTC HELP MODE ]

**CIRT** This function provides you circuit diagram like [figure III.17]



[ Figure III.17 : DTC CIRT MODE ]

**FLOW** This function provides you flow like [figure III.18]

11. OXYGEN SENSOR	FLOW
*Turn ignition switch on. *Connect scan tool to data link connector. *Verify DTC P0130 is set. Are other DTCs also set? 1. Yes 2. No	

[ Figure III.18 : DTC FLOW MODE ]

## 5. FLIGHT RECORD

### 5- 1 OPERATION FLOW

#### 0.1 INITIAL SCREEN



0 1

#### VEHICLE AND SYSTEM SELECTION



Refer to “ Selecting Vehicle Mode”

#### FLGHT RECORD

ENTER



1.3 FLIGHT RECORD			
×	11.OXYGEN SENSOR	97	mV
×	12.MASS.AIR FLOW SNSR	1308	mV
	13.INT.AIR TEMP.SNSR	134	°F
	14.THROTTLE P.SENSOR	761	mV
	16.BATTERY VOLTAGE	14.1	V
	18.CRANKING SIGNAL	OFF	
	21.COOLANT TEMP.SNSR	195	°F
	22.ENGINE SPEED	812	rpm
<div> <div>FIX</div> <div>INTERVAL: 350ms</div> <div>CALL</div> <div>RCRD</div> </div>			

FIX



#### 1.3.1 FIX ITEM

CALL



#### 1.3.2 CALL MEMORIZED DATA

RCRD



#### 1.3.3 START RECORD

[ FLOW III.4 : FLIGHT RECORD MODE IN/OUT FLOW]



## 5-2 . MODE APPLICATION

The FLIGHT RECORD mode allows for the display and recording of data generated by the ECM as determined by the user of Hs-can Pro.

By using the **UP** / **DOWN** key, the display may be scrolled.

The function of the FLIGHT RECORD facility is determined by the following soft function keys :

**FIX**

This soft function key selects or releases the items for which data is to be recorded. The fixed are identified by means of an asterisk to the left of the item number on the Hi-scan pro screen. The maximum number of items which may be selected for FLIGHT RECORD functions is 8.

The data sampling time interval is displayed at the center of the bottom line of the screen.

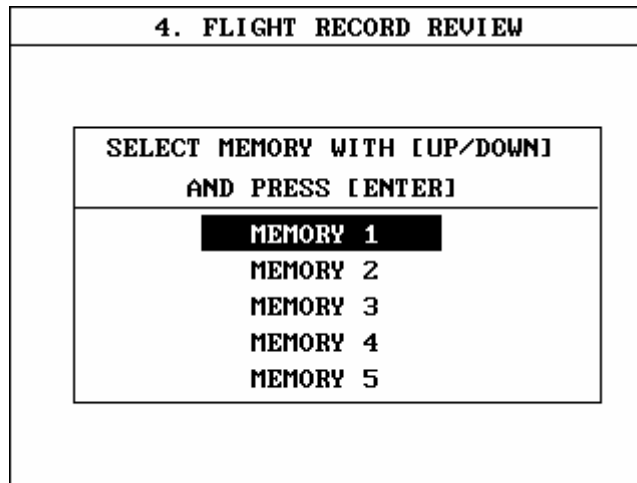
**CALL**

This function is used to replay the recorded data. Stored data is only overwritten when recording and therefore the same data can be viewed more than once/without being overwritten provided that no recording takes place.

If the stored file to be viewed relates to vehicle or system which differs from the current vehicle and system selection or if no recording data, the following message will be displayed.

**NO RECORDED DATA OR  
DIFFERENT SYSTEM DATA.**

If the the MEMORY EXPANSION CARD is installed and this key is pressed , then the message is displayed on the screen as shown in Figure III.19. The user can select one of the items to read.



[ Figure III.19 : FLIGHT RECORD (CALL) ]

MEMORY 1 indicates internal memory of Hi-scan Pro. In MEMORY 2 and MEMORY 3, each memory indicates of the MEMORY EXPANSION CARD.

If data is in the selected memory, stored data is displayed , But the following message will be displayed if the ID of the stored record is different from that of current vehicle and system selection or if no recorded data.

<p>NO RECORDED DATA OR DIFFERENT SYSTEM DATA</p>
--

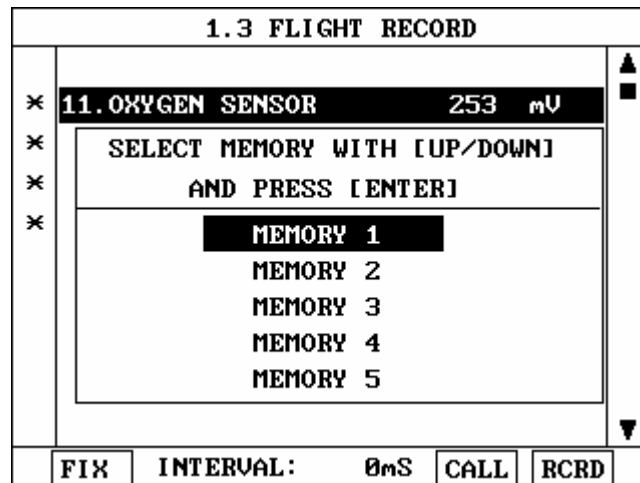
**RCRD** end when either the **END** or **ESC** key is depressed. During the recording function, the screen takes the appearance of that illustrated in [ figure III.20 ]

If the quantity of data being recorded exceeds the capacity of the Hi-scan Pro memory, the first recorded data of the current session will be progressively overwritten as recording continues. If an increased amount of memory is required, the option MEMORY EXPANSION CARD should be installed.

1.3 FLIGHT RECORD : Now Recording		
×	11.OXYGEN SENSOR	371 mV
×	12.MASS.AIR FLOW SNSR	1308 mV
×	14.THROTTLE P.SENSOR	761 mV
×	22.ENGINE SPEED	812 rpm
		5 %
		TRIG END

[ Figure III.20 FLIGHT RECORD (RECORDING) ]

If the MEMORY EXPANSION CARD has been installed and this key is pressed , than the message is displayed on the screen as in the following figure.



[ Figure III.21 : FLIGHT RECORD (RCRD) ]

MEMORY 1 indicates internal memory of Hi-scan Pro.  
 MOMORY 2 and MEMORY 3, each memory indicates  
 of the MEMORY EXPANSION CARD.

If user selects memory, [ Figure III.21 ] is display. If this key  
 is pressed without selected items ,the following message is  
 displayed.

SELECT ITEM WITH[FIX]

**TRIG**

This key is used to set trigger point in this recording process.

When **TRIG** key is depressed more than twice , only the latest **TRIG** key handled as trigger as trigger point.

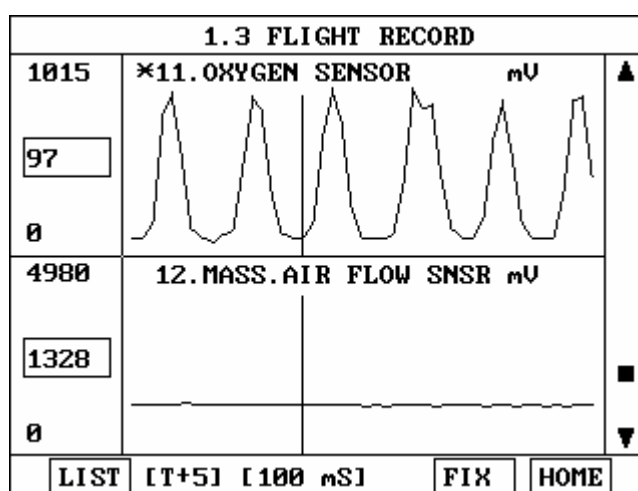
If **END** key or **ESC** key is depressed before **TRIG** key , that time becomes the trigger point and recording will be ended.

After finishing the recording, screen will display stored data values in a numeric data form. The screen example is as follows :

1.3 FLIGHT RECORD		
11.OXYGEN SENSOR	410	mV
12.MASS.AIR FLOW SNSR	1328	mV
14.THROTTLE P.SENSOR	761	mV
22.ENGINE SPEED	812	rpm
<div> <div>GRPH</div> <div>◀ HOME ▶</div> <div>HOME</div> </div>		

[ Figure III.22 : FLIGHT RECORD (NUMERIC) ]

In this numerical data display, **GRPH** key is used to see Graphic views for the items recorded by **FIX** key operation. When two items are selection, a graphical view is as follows.



[ Figure III.23 : FLIGHT RECORD (GRAPH) ]

[ T+5 ] MEANS SAMPLED TIME INDEX, AND CURRENT SCREEN DISPLAY THE DATE AFTER 5TH SAMPLING INDEX THAN TRIGGER POINT.

You can change sampled time index by ◀ or ▶ key. In graphic display, current sampled time index position is displayed as vertical line cursor. If this cursor is arrived end of screen, screen will be moved as half page.

## 6. ACTUATION TEST

### 6-1 OPERATION FLOW

0.1 INTIAL SCREEN



01

VEHICLE AND SYSTEM SELECTION



Refer to “ Selecting Vehicle Mode “

ACTUATION TEST

ENTER



1.4 ACTUATION TEST	
<b>NO.1 INJECTOR</b>	
DURATION	6 SECONDS
METHOD	DEACTIVATION
CONDITION	IG.KEY ON ENGINE RUNNING
PRESS [STRT], IF YOU ARE READY ?	
[STRT]	

START



1.4.1 START ACTIVATING

[ FLOW III.5 : ACTUATION TEST MODE IN/OUT FLOW ]

## 6-2 MODE APPLICATION

The ACTUATION TEST mode allows certain actuators to be Forcibly driven by Hi-scan Pro. The illustration of a typical screen is shown in [ figure III.24 ] .

The actuator to be driven can be changed by using the **UP** / **DOWN** key to scroll through the list.

1.4 ACTUATION TEST	
NO. 1 INJECTOR	
DURATION	6 SECONDS
METHOD	DEACTIVATION
CONDITION	IG.KEY ON ENGINE RUNNING
NOW TESTING ?	
STRT	

[ Figure III.24 : ACTUATOR DRIVING ]

The test must be performed with the vehicle in the state indicated by the CONDITION statement on the screen .in this illustration given, for example, the ignition key must be turned “on”, and the engine be stopped.

The duration of the test will either be fixed by Hi-scan Pro and indicated on the screen or the duration dialogue will indicate



**UNTIL STOP KEY**

To begin an actuator test, the **STRT** key should be pressed. For fixed duration test, the message

**COMPLETED!**

will be display after an acknowledged code has been received from the vehicle. For tests of no fixed duration, the message

**NOW ACTIVATING**

Will be displayed once an acknowledged code has been received from the vehicle and until the **STOP** key is pressed. In both types of test, the message

**TEST FAILURE!**

Will be displayed if no acknowledge code is received from the Vehicle. The messages will be displayed for 0.5 seconds and Then disappeared.

## 7. SIMU-SCAN

### 7-1. OPERATION FLOW

#### 0.1 INTIAL SCREEN

01

#### SELECTION OF VEHICLE MODE AND SYSTEM

Refer to "Selecting Vehicle Mode"

#### SIMU-SCAN

ENTER

1.5 SIMU-SCAN			
11. OXYGEN SENSOR	78	mV	▲
12. MASS. AIR FLOW SNSR	1308	mV	■
13. INT. AIR TEMP. SNSR	141	°F	
14. THROTTLE P. SENSOR	761	mV	▼
VOLT METER			
-0.0 V		CH A	
MAX : 0.0 V		MIN : -0.0 V	
METR	SIML	CLR	FIX

FIX

1.5.1 FIX ITEM

METR

1.5.2 MULTI-METER

SIML

1.5.3 SENSOR SIMULATION

[ FLOW 111.6 : SIMU-SCAN MODE IN/OUT FLOW ]

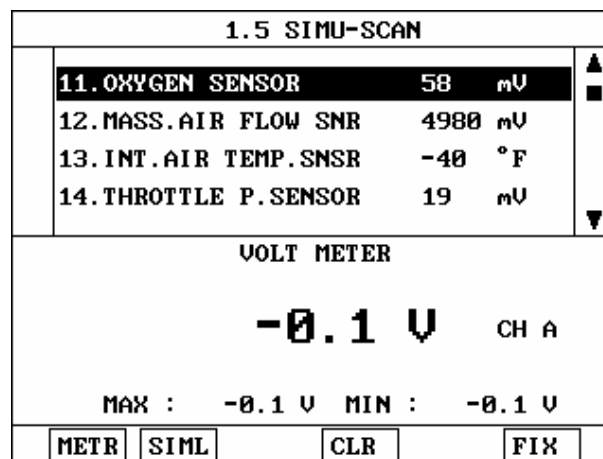
## 7-2. MODE APPLICATION

Hi-scan Pro offers several methods of performing data analysis. using the multi-meter function, voltage, frequency, duty, resistance and current ratios may be measured. The vehicle sensor simulation function permits simulated voltages, frequencies or duty ratios to be generated.

However, one of the most powerful features of Hi-scan Pro is SIMU-SCAN which allows sensor output generation and current data analysis to be performed simultaneously.

The soft function keys are arranged so that the **METR** **SIML** and **FIX** keys are available in all 8 screens. In addition, further soft function keys are available at the levels illustrated below.

The last used SIMU-SCAN screen is saved by Hi-scan Pro or Is used as the default. Where no previous screen has been Saved in the Hi-scan Pro back up memory, the default is as Shown in [ figure 111.25 ]



[ Figure III.25 : SIMU-SCAN ]

The **UP** / **DOWN** key provides the means to scroll through the data display. Other functions are available by means of the soft function keys.

1.5 SIMU-SCAN			
11.OXYGEN SENSOR	722	mV	▲
12.MASS.AIR FLOW SNSR	1289	mV	■
13.INT.AIR TEMP.SNSR	141	°F	
14.THROTTLE P.SENSOR	761	mV	▼
SELECT METER TO MEASURE !!			
1.VOLT			
2.FREQUENCY			
METR	SIML	CLR	FIX

[ Figure III.26 : SIMU-SCAN(METR) ]

**METR**

The multi-meter function is activated by this key permitting measurement of voltages, frequency as illustrated in [ figure 111.26 ]

METER function is SIMU-SCAN mode display sensor output generation below screen and current data analysis upper screen simultaneously.

Especially, these data simultaneously displayed in Hi-Scan pro screen allow easy analysis of wire and ECU problems.

**01 Voltage** ↶ The meter measures voltages across the range Max 500V. the display indicates the current voltage, the input channel and the maximum and minimum voltages recorded during the voltage measuring mode.

The multi-meter input channel is A. And the maximum and minimum voltage can be reset by using the **CLR** key. So user can measure the maximum and minimum voltage again from when **CLR** key is pressed. [ Figure III.27 ] illustrates a typical voltage measurement screen.

1.5 SIMU-SCAN			
11. OXYGEN SENSOR	58	mV	▲
12. MASS. AIR FLOW SNSR	4980	mV	■
13. INT. AIR TEMP. SNSR	-40	°F	
14. THROTTLE P. SENSOR	19	mV	▼
VOLT METER			
-0.1 V CH A			
MAX : -0.1 V MIN : -0.1 V			
METR	SIML	CLR	FIX

[ Figure III.27 : SIMU-SCAN (VOLT)]

## 02. Frequency

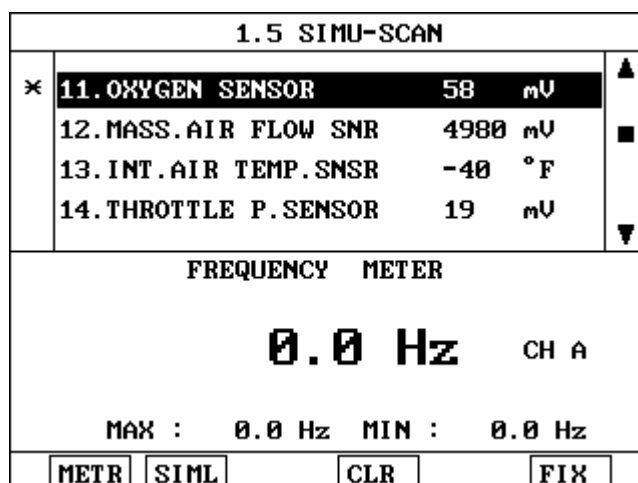


1.5 SIMU-SCAN			
11.OXYGEN SENSOR	97	mV	▲
12.MASS.AIR FLOW SNSR	1308	mV	■
13.INT.AIR TEMP.SNSR	143	°F	
14.THROTTLE P.SENSOR	761	mV	▼
SELECT METER TO MEASURE !!			
1.FREQUENCY		2.DUTY(+)	
3.DUTY(-)		4.PULSE WIDTH(+)	
5.PULSE WIDTH(-)			
METR	SIML	CLR	FIX


[ Figure III.28 : SIMU-SCAN (FREQ)]

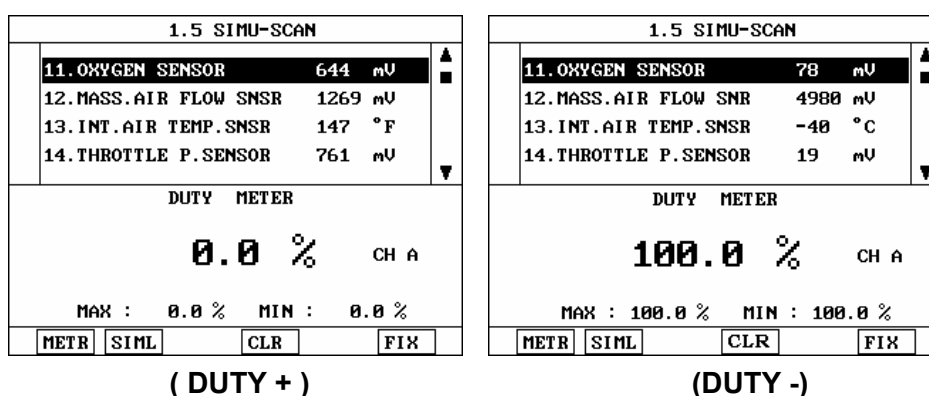
This function can measure frequency, RPM, duty(+,-), pulse width like [figure III.28]

- 01  The meter indicates frequencies across the range 0-100 KHz.



[Figure III.29 : SIMU-SCAN(FREQ)]

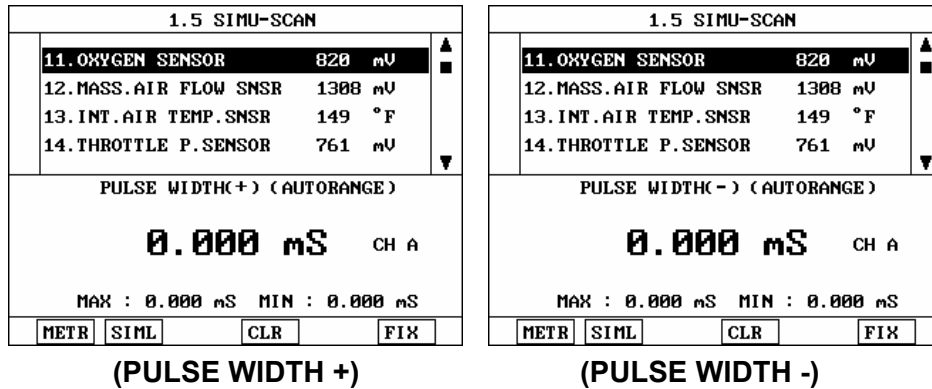
- 02  The meter measures duty ratio across the range 1-100%.  
 + The display indicates the current measurement.  
 03 The DUTY(+) and DUTY(-) keys are used to change the duty ratio measurement polarity as required.



[ Figure III-30 : SIMU-SCAN (DUTY)]

04 This function can measure pulse width.

05 you can select pulse width(+) or (-) like [figure III.28]



[ Figure III-31 : SIMU-SCAN (DUTY)]

**SIML**

Simulator functions are executed by depressing this key.  
3 different kinds of simulation are available.

1. VOLTAGE
2. FREQUENCY & DUTY
3. VEHICLE SPEED

A typical sensor simulating screen is shown in [ figure 111.32 ]

1.5 SIMU-SCAN		
11. OXYGEN SENSOR	429	mV
12. MASS. AIR FLOW SNSR	1250	mV
13. INT. AIR TEMP. SNSR	152	°F
14. THROTTLE P. SENSOR	761	mV
SELECT SIMULATION !! 1. VOLTAGE 2. FREQUENCY & DUTY 3. VEHICLE SPEED		
METR	SIML	CLR
		FIX

[ Figure III.32 : SIMU-SCAN(SIML) ]

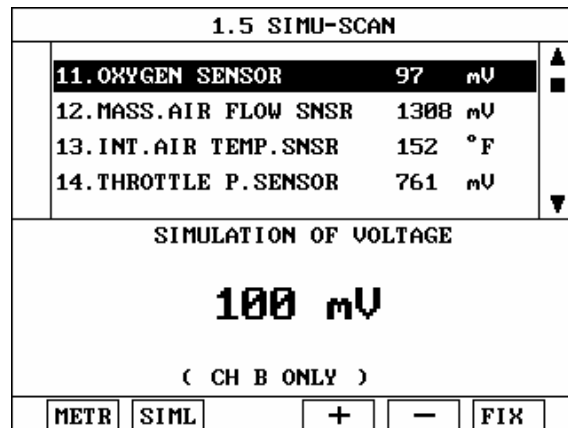
- 01 pressing this key activates sensor output voltage simulation. The voltage generated through channel B can be set using the  and  keys in 20mV steps. If the set voltage and the applied voltage differ by less than 10%, voltage feedback control is maintained by Hi-scan Pro.

IF THE DIFFERENCE EXCEEDS 10%, THE FOLLOWING MESSAGE IS DISPLAYED AND NO VOLTAGE OUTPUT OCCURS.

SIMULATOR SIGNAL IS DISTORTED  
CHECK PROBE, PRESS [ ENTER ]

A typical voltage output simulation screen is shown in [ figure III.33]





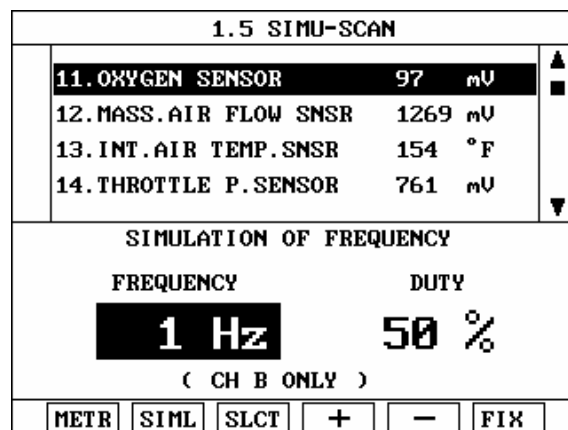
[ Figure III.33 :SIMU-SCAN(SIMV) ]

02



Pressing this key activates sensor frequency/duty output simulation. The frequency generated through channel B can be set using the **+** / **-** key in steps of 1HZ or 1% Frequency and/or duty can be generated by using **SLCT** to select either frequency or duty as required. The output range of this simulation is 0-1 KHZ for frequency and 0-100% for duty.

A typical frequency output simulation screen is shown in [ figure III.34]



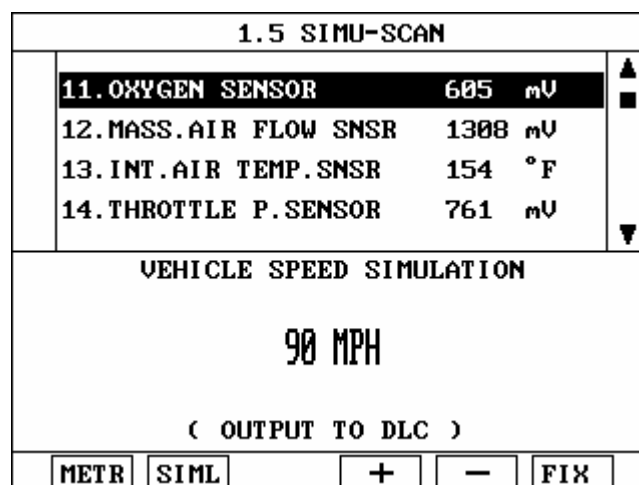
[ Figure III.34 : SIMU-SCAN (SIMF) ]

03

Pressing this key activates the vehicle speed simulation function which generates a simulated speed sensor voltage through DLC.

The simulated speed may be changed by use of the **+** and **-** keys between 0 and 255Km/h in 1 Km/h steps. The unit of measure may be changed from Km/h to MPH and vice versa through the DATA SETUP option.

An example of the vehicle speed sensor simulation screen is illustrated in figure III.35.



[ Figure III.35 : SIMU-SCAN (VSS) ]

※Note) available only for electronic type  
(please refer to shop manual)

FIX

This function moves the line in reverse text to the top of the display. This line is held and does not move when the cursor keys are used to page through the display and therefore allows specific lines to be compared directly to one another.

The fixed line is identified by an asterisk and may be released by selecting the fixed line and depressing the FIX key.

## 8. SYMPTOM ANALYSIS

### 8-1. OPERATION FLOW

0.2 INTIAL SCREEN



01

ENTER

VEHICLE AND SYSTEM SELECTION



01

ENTER

SYMPTOM ANALYSIS



06

ENTER

1.6 SYMPTOM ANALYSIS ▼	ENGINE HESITATE, ACCELERATES POORLY ▼
<b>01.ENGINE HESITATE, ACCELERATES POORLY</b> 02.POOR DRIVING 03.STALL-SOON AFTER STARTING 04.STALL-AFTER ACCEL. PEDAL DEPRESSED 05.STALL-AFTER ACCEL. PEDAL RELEASED 06.ENGINE STALL-DURING A/C ON 07.DOES NOT CRANK 08.STARTER RUNS BUT ENGINE NOT CRANK	<b>01.INJECTOR &amp; FUEL QUALITY</b> 02.IGNITION CIRCUIT 03.OXYGEN SENSOR 04.AIR FLOW SENSOR 05.THROTTLE POSITION SENSOR 06.TIMING MARK 07.COMPRESSION PRESSURE 08.FUEL PRESSURE
	<div>DATA</div> <div>PART</div> <div>HELP</div>



F4 DATA

GRAPH, DATA



F4 PART

SENSOR DIAGNOSIS



F4 HELP

ADDITIONAL RUNCTION

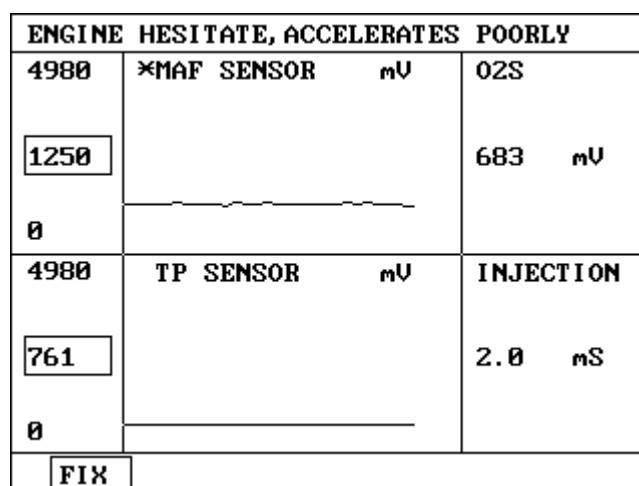
[ FLOW III.7 : SYMPTOM ANALYSIS ]

## 8-2.SYMPTOM ANALYSIS MODE

The SYMPTOM analysis offers various vehicle trouble symptoms and their relational items which will be diagnosed.

**F4 DATA**

Key displays graph and data of the selected sensors.  
Up to 4 graph and data items can be displayed simultaneously on one screen.



[ Figure III.36 : SYMPTOM ANALYSIS(DATA) ]

**F5 PART**

Key displays oscilloscope of selected sensor data.

**F6 HELP**

Key displays TIPS, right wave forms, trouble code examples, and circuit diagrams and service flow charts.

ENGINE HESITATE, ACCELERATES POORLY ▼		
<div> <div>01. INJECTOR &amp; FUEL QUALITY</div> <div>02. IGNITION CIRCUIT</div> <div>03. OXYGEN SENSOR</div> <div>04. AIR FLOW SENSOR</div> <div>05. THROTTLE POSITION SENSOR</div> <div>06. TIMING MARK</div> <div>07. COMPRESSION PRESSURE</div> <div>08. FUEL PRESSURE</div> </div>		
		<div>TIPS</div> <div>WAVE</div> <div>CASE</div> <div>CIRT</div> <div>FLOW</div>
DATA		PART
		HELP

[ Figure III.37 : SYMPTOM ANALYSIS(HELP) ]

## 9. EVAP. LEAKAGE TEST

### 9-1. OPERATION FLOW

0.3 INTIAL SCREEN



01

ENTER

VEHICLE AND SYSTEM SELECTION



01

ENTER

EVAP. LEAKAGE TEST



07

ENTER

1. HYUNDAI VEHICLE DIAGNOSIS

TEST CONDITION

1. ENGINE : IDLE

2. VEHICLE : STOPPED

3. SELECTOR LEVER POSITION : N

PRESS [ENTER] TO START

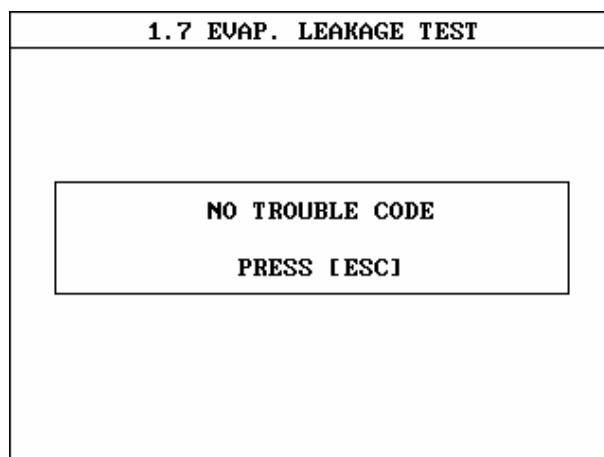
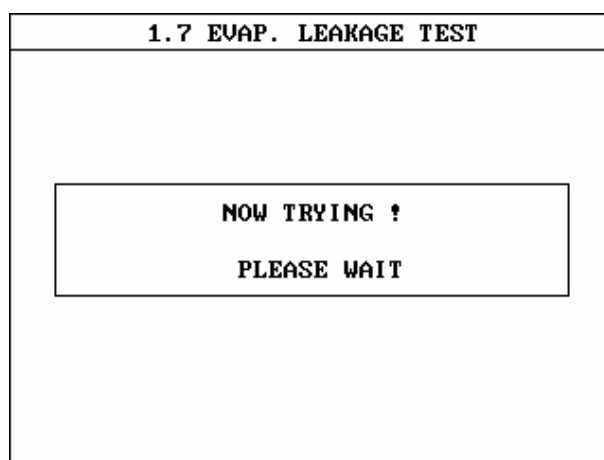
[ FLOW III.8 : EVAP. LEAKAGE TEST ]

For testing this function, you need to check after vehicle condition like [FLOW III.8]

III. HYUNDAI VEHICLE DIAGNOSIS

## 9-2. EVAP. LEAKAGE TEST MODE

The EVAP. Leakage Test is based on the diagnosis module for tank leakage detection uses an electrically driven vane pump. Please follow the HI-SCAN PRO EVAP.LEAKAGE TEST process like picture



[ Figure III.38 : EVAP. LEAKAGE TEST(NORMAL)]

You will see below message & like [figure III.38], after test.

**EVAPORATIVE SYSTEM FAULT**

You need to check system not to have evaporative gas leakage due to evaporative gas system problem or system problem.

**CONDITION NOT CORRECT**

You need to retry checking condition like [figure III,38]

**COMMUNICATION ERROR**

Even after retry, if you still find above error, you need to check Communication.



***Hi-scan Pro***

## **IV. TOOL BOX(DVOM/SCOPE**

- 1. CONNECTION METHOD**
- 2. ENGINE**
- 3. AUTOMATIC TRANSAXLE**
- 4. OSCILLOSCOPE**
- 5. METER( V, F, R, A, T, P)**
- 6. ACTUATOR DRIVING**
- 7. SENSOR SIMULATOR**

## IV. TOOL BOX

IV – 2

### **4. CONNECTION METHOD**

The power supply for Hi-scan Pro when using the **VEHICLE SCOPEMETER** features should be as described in section IV-1. The DLC cable is not used in this mode.

Once the power supply has been connected, the **SCOPE PROBE** should be connected to channel A and/or B of the HI-Scan Pro.

**MAXIMUM VOLTAGE INPUT IS 500V DC. VOLTAGE IN EXCESS OF 500V DC MAY CAUSE DAMAGE TO HI-Scan Pro.**

***Hi-scan Pro* OPERATION GUIDE**

**IV - 3**

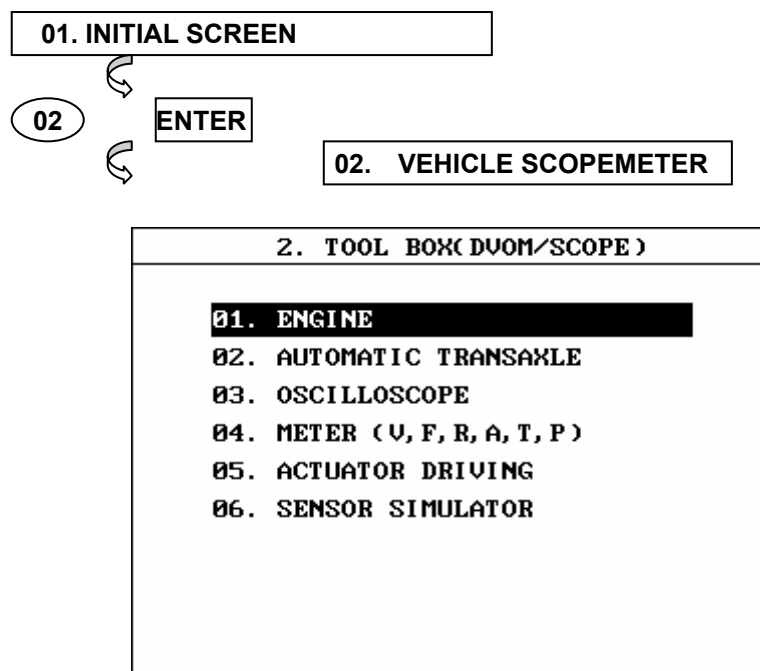
[ FIGURE IV.1 : VEHICLE SCOPEMETER MODE CONNECTION ]

#### IV. TOOL BOX

IV - 4

## 5. ENGINE

### 2-1. OPERATION FLOW



01



ENTER

2.1 ENGINE
<b>01. SENSORS</b>
02. ACTUATORS
03. IGNITION
04. OTHERS

[FLOW IV.1 : Engine Diagnosis Test]

## *Hi-scan Pro* OPERATION GUIDE

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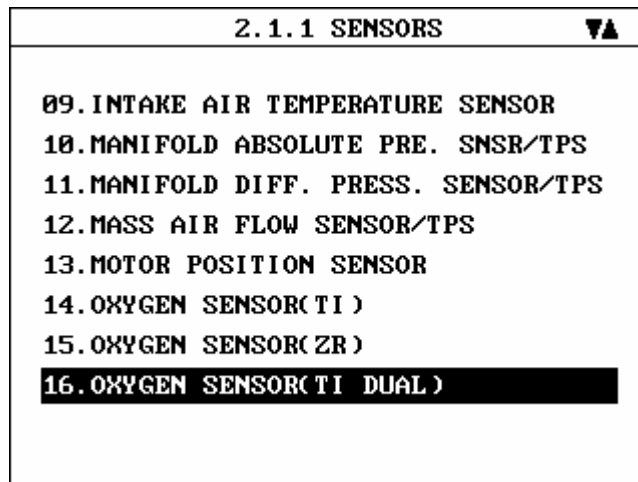
01



ENTER

2.1.1 SENSORS	▼
<b>01. CKP/CMP SENSOR (HALL)</b>	
02. CKP/CMP SENSOR (ANALOG)	
03. CKP/CMP SENSOR (MELCO)	
04. CKP SENSOR (HALL)	
05. CKP SENSOR (ANALOG)	
06. CKP SENSOR (MELCO)	
07. ENGINE COOLANT TEMPERATURE SNSR	
08. EXHAUST GAS RECIRCULATION SNSR	

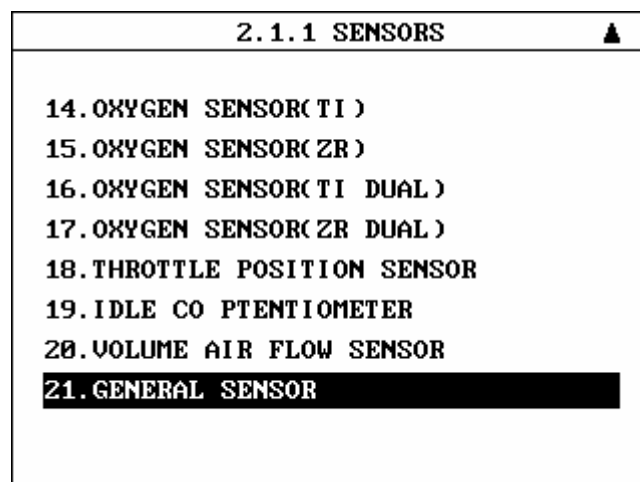
[FIGURE IV.2 : SENSOR DIAGNOSIS TEST]



*[FIGURE IV.3 : SENSOR DIAGNOSIS TEST]*

#### IV. TOOL BOX


IV – 6



*[FIGURE IV.4 : SENSOR DIAGNOSIS TEST]*

Sensor diagnosis test supports 21 of different data items as illustrated in figure [IV.2] through [IV.4]

02



ENTER

2.1.2 ACTUATORS

01.IDLE SPEED ACTUATOR

02.INJECTORS

03.STEP MOTOR


[FIGURE IV.5 : ACTUATOR TEST]

Actcators Test support 3 of data items as illustrated in figure [IV.5]

*Hi-scan Pro* OPERATION GUIDE

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03



ENTER

2.1.3 IGNITION

01.PRIMARY IGNITION COIL

02.SECONDARY IGNITION COIL

03.POWER TRANSISTOR

04.IGNITION FAILURE SENSOR



[FIGURE IV.6 : IGNITION TEST]

Ignition test supports 4 of data items as illustrated in figure [IV.6]

04 ↩ ENTER

2.1.4 OTHERS
01. BATTERY
02. GENERATOR

[FIGURE IV.7 : OTHERS TEST]

Others test supports 2 of data items as illustrated in figure [IV.7]

IV. TOOL BOX

IV - 8

## 2-2. SECONDARY WAVEFORM DIAGNOSIS MODE

01. INITIAL SCREEN

02 ↩ ENTER

**02. VEHICLE SCOPEMETER**

**01**  **ENTER** **01. ENGINE**

2.1 ENGINE
<b>01. SENSORS</b>
<b>02. ACTUATORS</b>
<b>03. IGNITION</b>
<b>04. OTHERS</b>

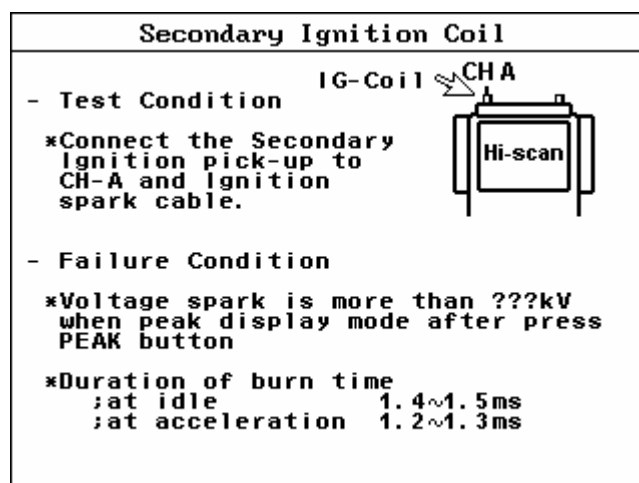
**[FIGURE IV.8 : ENGINE TEST]**

Since the ignition system operates at high voltage, it is Dangerous to touch high-tension circuit components such As the ignition coil, spark plug caps and distributor cap.

**03**  **ENTER**

2.1.3 IGNITION
<b>01. PRIMARY IGNITION COIL</b>
<b>02. SECONDARY IGNITION COIL</b>
<b>03. POWER TRANSISTOR</b>
<b>04. IGNITION FAILURE SENSOR</b>

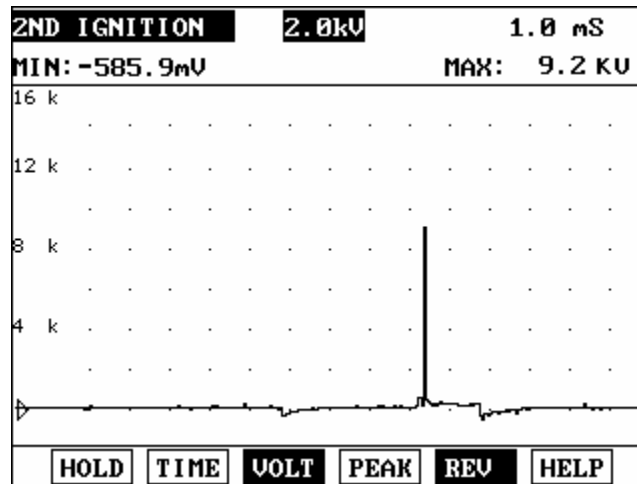
[FIGURE IV.9 : IGNITION TEST]



[FIGURE IV.10 : INSTALL INSTRUCTION]



ENTER



[FIGURE IV.11 : SECONDARY WAVEFORM DIAGNOSIS]

Test secondary waveform diagnosis according to the Procedures from [figure IV.9] to [figureIV.11]

Burn time is displayed with at value in this mode, To get a Detailed surge voltage, press F4(PEAK) key.

**HOLD** You can stop recoding of voltage signal by pressing **HOLD** Key. In the hold mode, voltage displayed on screen is frozen To allow analysis of voltage.

**TIME** Press **TIME** key and use of the **UP** or **RIGHT** Key increase the time division value. While **DOWN** or **LEFT** key being used to decrease the time base value. A range of preset values from 50 $\mu$ s to 50 second is available.

**VOLT** The voltage scale may be selected by depressing this key  
Press **VOLT** key and use of the **UP** or **RIGHT** key  
Increases the voltage division, while **DOWN** or **LEFT**  
Being used to decrease the voltage division a range of preset  
Values from 200V to 50KV is available.

**PEAK** Press **PEAK** key, you can measure surge value of  
secondary waveform both of measured voltage values max  
and min are displayed on top screen.

**REV** To change polarity of waveform on screen. Press this **REV**  
Key.

Actual waveform in vehicle is in opposite direction, so by  
using **REV** key, waveform can be shown in right direction.

**HELP** With selecting Help key in below screen, you will see repair  
guide, standard waveform, case study, circuit diagram, flow  
for exah DTC. If there is no help function, below message  
will be shown.

NO TIPS. FOR MORE INFORMATION,  
REFER TO THE SHOP MANUAL

Please refer to Page III.7 for detailed explanation.

### 3. AUTOMATIC TRANSAXLE MODE

#### 3-1. OPERATION FLOW

##### 01. INITIAL SCREEN

02



ENTER



##### 02. VEHICLE SCOPEMETER

2. TOOL BOX(DUOM/SCOPE)
01. ENGINE
<b>02. AUTOMATIC TRANSAXLE</b>
03. OSCILLOSCOPE
04. METER (V, F, R, A, T, P)
05. ACTUATOR DRIVING
06. SENSOR SIMULATOR

02



ENTER

2.2 AUTOMATIC TRANSAXLE ▼
<b>01. 2ND BRAKE SOLENOID VALVE</b>
02. DAMPER CLUTCH CONTROL SOL. VALVE
03. LOW & REVERSE BRAKE SOL. VALVE
04. OIL TEMPERATURE SENSOR
05. OVER DRIVE SOLENOID VALVE
06. PRESSURE CONTROL SOLENOID
07. PULSE GENERATOR A (ANALOG)
08. PULSE GENERATOR B (ANALOG)

## [FLOW IV.2 : AUTOMATIC TRANSAXLE DIAGNOSIS]

There are 8 of data items in this mode. Diagnostic procedures  
In this mode are same as engine diagnosis.

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## 4. OSCILLOSCOPE

### 4-1. OPERATION FLOW

01. INITIAL SCREEN

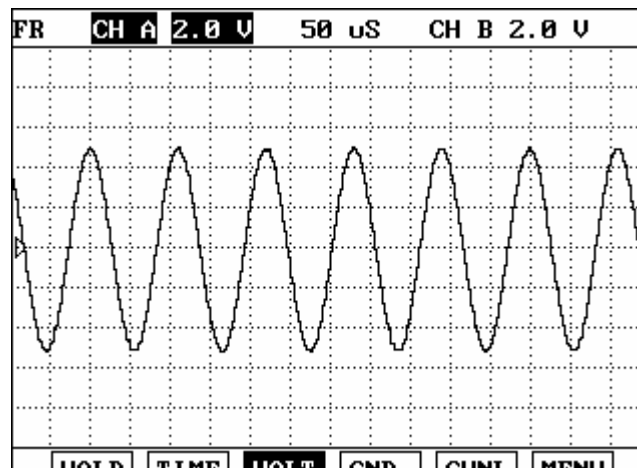
02.  ENTER

02. VEHICLE SCOPEMETER

2. TOOL BOX(DVOM/SCOPE)
01. ENGINE
02. AUTOMATIC TRANSAXLE
<b>03. OSCILLOSCOPE</b>
04. METER (V, F, R, A, T, P)
05. ACTUATOR DRIVING
06. SENSOR SIMULATOR

## [FLOW IV.3 : VEHICLE SCOPE MODE FLOW]

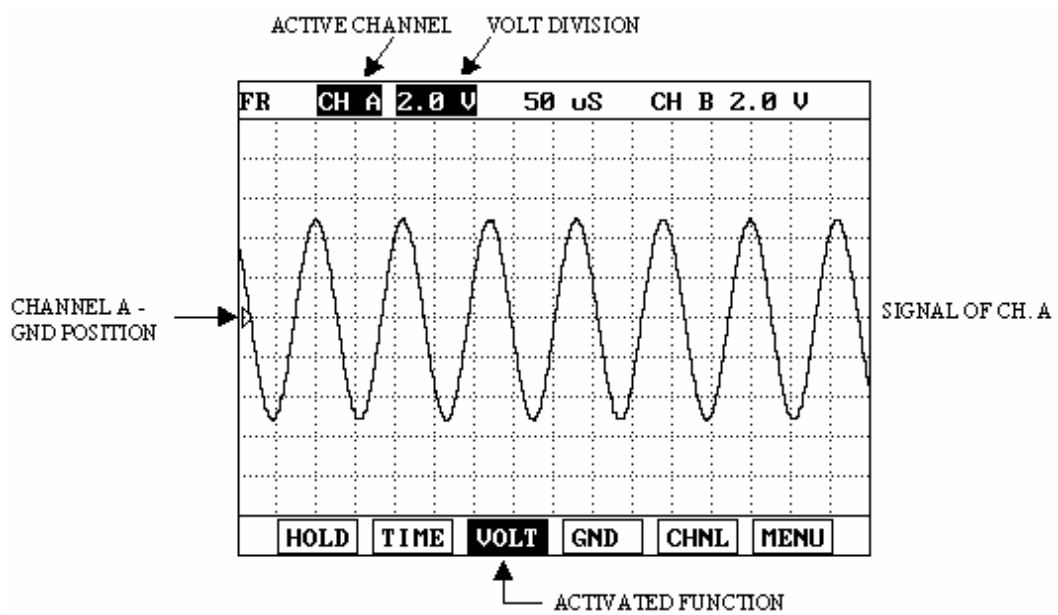
03.  ENTER






[FIGURE IV.13 : VEHICLE SCOPE]

#### IV. TOOL BOX







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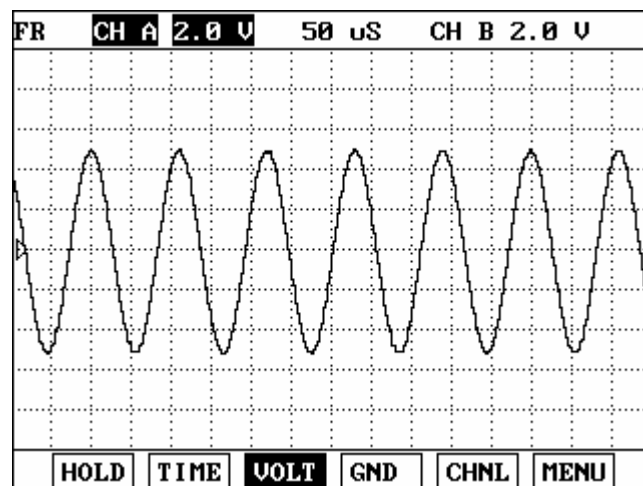
[FIGURE IV.12 : OSCILLOSCOPE DISPLAY]

	<b>HOLD</b>	Run/Hold Display
	<b>TIME</b>	Setup Time Base
	<b>VOLT</b>	Setup Voltage Scale



	<b>GND</b>	<b>Setup Ground level</b>
	<b>CHNL</b>	<b>Setup Ground level</b>
	<b>MENU</b>	<b>Added Function Display</b>
	<b>ZOOM</b>	<b>Zoom Function</b>
	<b>CURS</b>	<b>Analysis Voltage, Time, Frequency</b>
	<b>RECD</b>	<b>Record Function</b>

## 4-2. RUN MODE APPLICATION



[FIGURE IV.13 : OSCILLOSCOPE MODE DISPLAY]

The oscilloscope mode allows signal waveforms to be Displayed on the screen. Hi-scan Pro offers 2 channel (1MHZ) storage oscilloscope function offering both run and hold modes.

This mode is set so that you can see signal serene changes.

#### **HOLD**

Depressing this key changes the mode from run to hold. In the hold mode, the waveform displayed on screen is frozen to allow analysis of the waveform when the hold feature is used, the **HOLD** key appearance on the serene change to reverse text.

### **IV, TOOL BOX**

#### **IV – 16**

#### **TIME**

The osilloscope time division may be changed by depressing this key which will move the cursor to the time base sector of the display. Use of the **UP** or **RIGHT** key increases the time division value, **DOWN** or **LEFT** being used to decrease the time division value.

A range of preset from 50  $\mu$ s to 50 second is available.

#### **VOLT**

The voltage division may be selected by depressing this key Which moves the cursor to the current channel voltage scale sector of the display. Use of the **UP** or **RIGHT** key increases the voltage division, **DOWN** or **LEFT** being used to decrease the voltage division.

A range of preset values from 0.2 to 50 volts is available.

#### **GND**

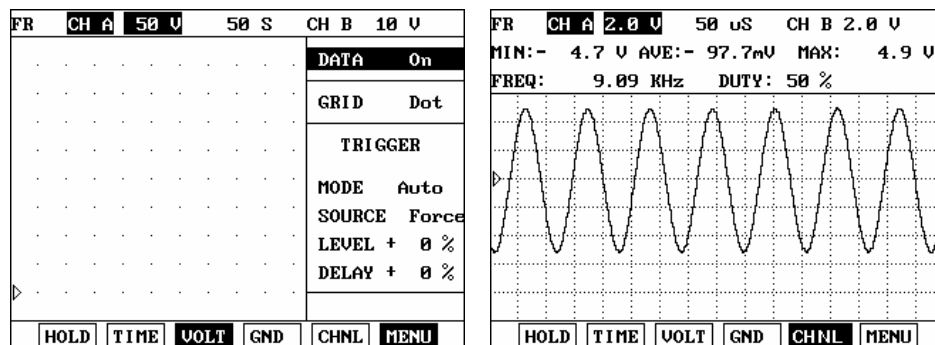
You can move ground with using arrow key **UP** or **DOWN**

The selected ground A and B can be reversed and only Reversed ground can be moved.

**CHNL**

This key toggles the selected channel between A, B, both A And B.

The selected channel is displayed in reverse text.



[ FIGURE IV.14 ]

## Hi-scan Pro OPERATION GUIDE

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**MENU**

This key can help you select of data ON/OFF. grid DOT/LINE And trigger. Press **MENU** KEY (F6), screen is displayed

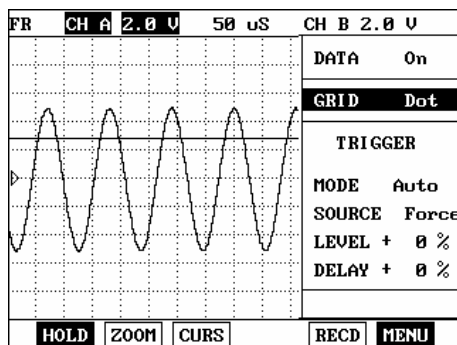
as illustrated figure IV.14. If you press **MENU** key one more, screen is disappeared.

Figure IV.14 shows “DATA ON” screen, values of max and Min, average of voltage, frequency and duty are displayed. Use of **LEFT** or **RIGHT** of key can be selected data ON Or data OFF.

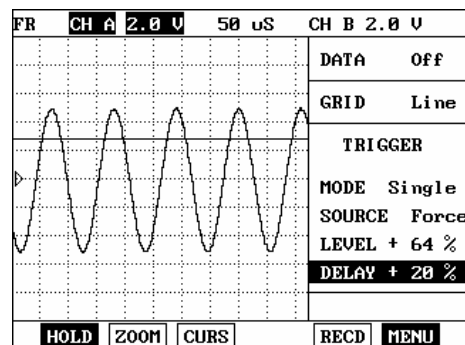
Figure IV.15 shows grid patterns, you can select Line or dot with pressing arrow key **LEFT** or **RIGHT** .

The example for trigger setting up is illustrated figure iv.16.  
 The line parallel with voltage line shows trigger level(64%)  
 And it's level can be changed with using arrow key **LEFT** or **RIGHT**.

**MODE** – Depressing arrow key **LEFT** or **RIGHT** hanges mode of Auto,



[FIGURE IV.15 ]



[FIGURE IV.16 ]

#### IV. TOOL BOX

IV – 18

Repeat and single

\*Auto mode : do not trigger function.

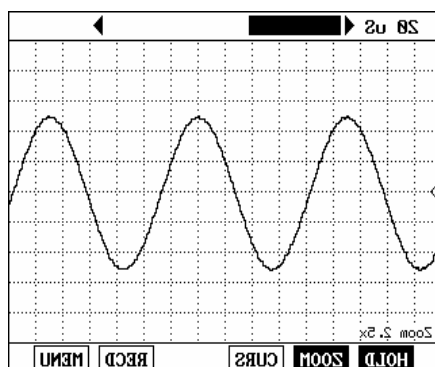
\*Repeat : Input selected and repeated waveform by setted trigger function.

\*Single : Input one waveform with setting up trigger by setted trigger

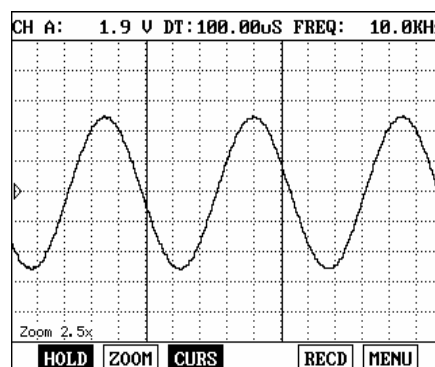
Source – source change is by means of **LEFT** or **RIGHT**

**Keys.** If the source selected A↓, the waveform display only when The input waveform is in the below trigger level.

**DELAY – Key** offers control the start point of waveform on the Screen when the single trigger mode operated. Consider lateral axis 100% left delay selection value is 20%, the waveform start 20% left from the lateral axis.



[ FIGURE IV.17 ]



[ FIGURE IV.18 ]

**ZOOM**

Key can be used in the condition of selected **HOLD** key  
Maximum a 5 times enlarged waveform is illustrated

[ figure IV.17 ] The magnification of Zoom function can be changed according to waveform time on **HOLD** condition.

#### **CURS**

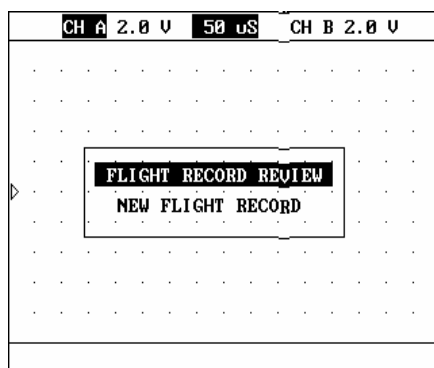
Depressing this key can help you check easily voltage, time and frequency of waveform with two vertical line on the screen as illustrated [ figure IV.18 ]

Use of arrow key **LEFT** or **RIGHT** moves two of vertical lines.

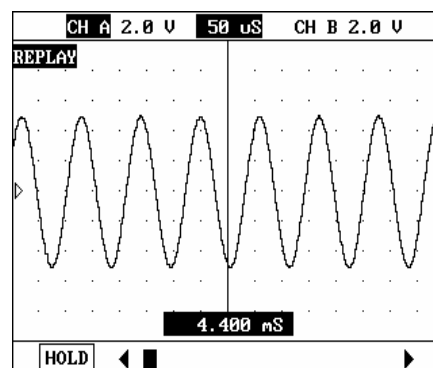
#### **RCRD**

This key for recording waveform. Maximum 400 screen which record before **HOLD** in Fight Record Review as illustrated [ figure IV.19 ]

New Flight Record is the function for recording new waveform which inputed in present.[ Figure IV.20 ] shows regeneration function of recorded datas.



[ FIGURE IV.19 ]



[ FIGURE IV.20 ]

## **IV. TOOL BOX**

## 5. MULTI METER

### 5-1. OPERATION FLOW

01. INITIAL SCREEN

02.



ENTER

02. VEHICLE SCOPEMETER

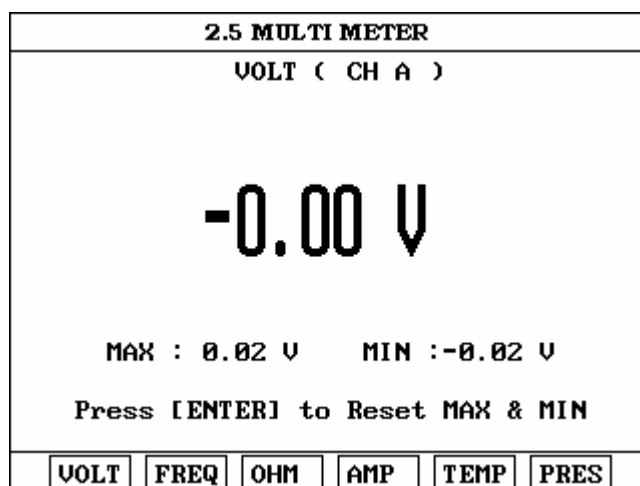
05









2. TOOL BOX( DVOM/SCOPE )
01. ENGINE
02. AUTOMATIC TRANSAXLE
03. OSCILLOSCOPE
<b>04. METER ( V, F, R, A, T, P )</b>
05. ACTUATOR DRIVING
06. SENSOR SIMULATOR

[FLOW IV.4: MULTI METER FUNCTION ]

You can measure voltage. Frequency, resistance, current, temperature and pressure in this mode.

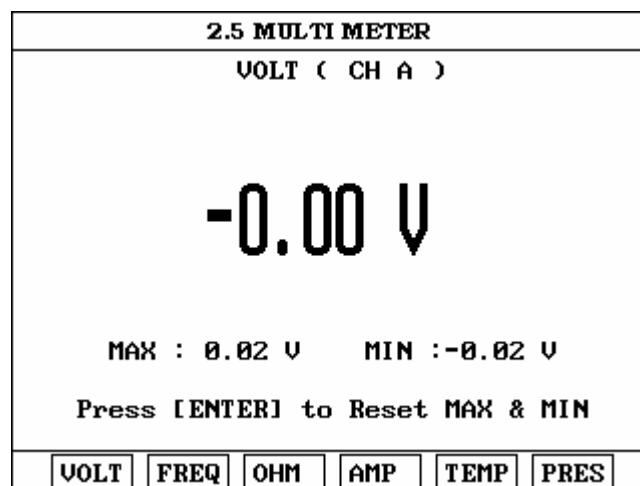


[ FIGURE IV.21 : VOLTAGE MEASURE ]

	F1 VOLT	VOLTAGE MEASUREMENT KEY
	F2 FREQ	FREQUENCY MEASUREMENT KEY
	F3 OHM	RESISTANCE MEASUREMENT KEY
	F4 AMP	CURRENT MEASUREMENT KEY
	F5 TEMP	TEMPERATURE MEASUREMENT KEY
	F6 PRES	PRESSURE MEASUREMENT KEY



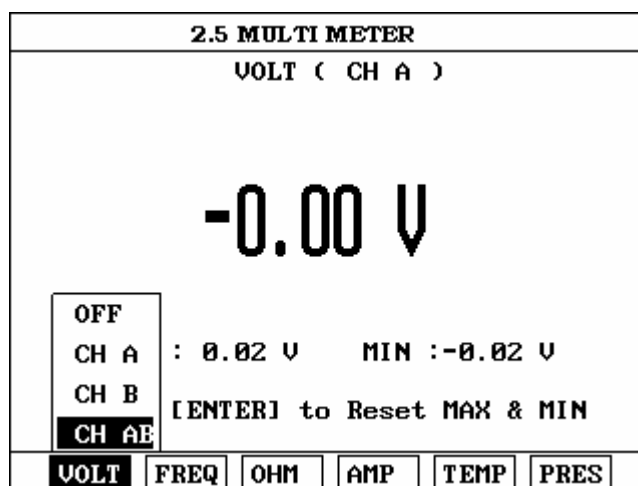
## 5-2. MULTI METER MODE OPERATION



[ FIGURE IV.22 : VOLTAGE MEASURE ]

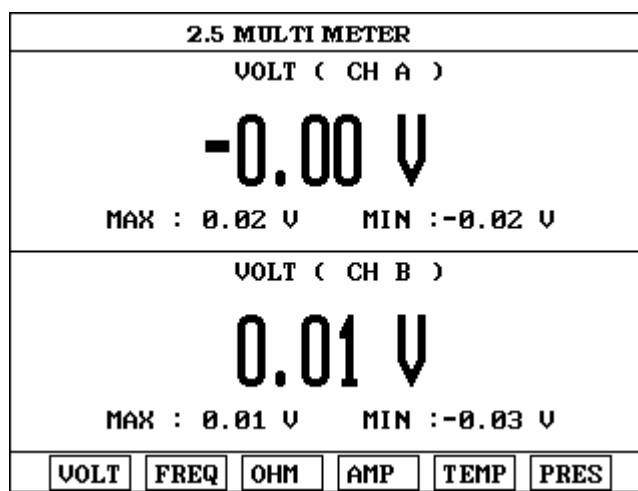
The meter measures voltage across the range  $-500V \sim 500V$ . This multi meter enable to measure automatically current voltage and to show the maximum and minimum voltage recorded during the voltage measuring mode. If you press F1 (VOLT) in this mode, channel A,B and AB are displayed as illustrated [ figure IV.23 ] You can select a channel by fixing the arrow key **UP** or **DOWN** and then pressing **ENTER** key. You wanted channel in other modes like frequency, current, temperature measure can selected with same procedures in the voltage measuring mode.

## IV – 23



[ FIGURE IV.23 : SELECTING CHANNEL ]

Voltage measuring mode can display with one of input channel in other modes except resistance measure at the same time as illustrated in figure [ IV.24 ]

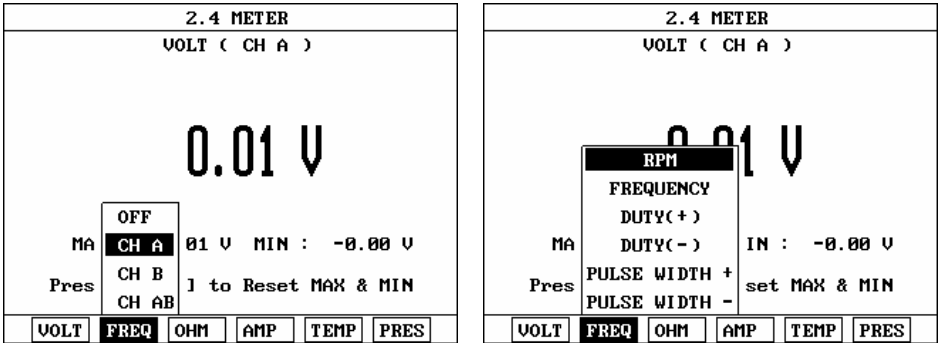


[ FIGURE IV.24 : VOLTAGE MEASUREMENT ]

IV. TOOL BOX  
IV – 24

FREQ

The multi meter indicates frequencies across the range 0-100KHZ. Pressing F2(FREQ) key displays channel and you can change channel at the time.  
**You can measure rpm, frequency, duty, pulse width like [figure IV.25 ].**



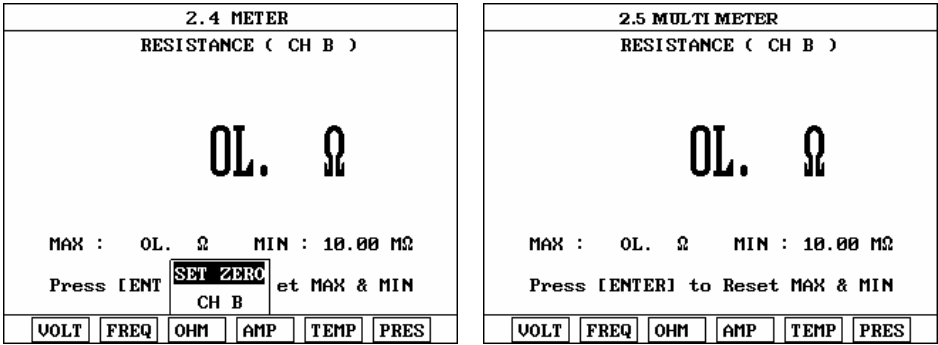
[ FIGURE IV.25 : FREQUENCY MEASUREMENT ]

OHM

Resistance Measurement can be used by pressing OHM key with measuring resistance across the range 0-100MΩ

This function cannot accompany with other measurement modes.

Do not attempt to measure the resistance function to any circuit to which voltage is applied, because doing so may damage the Hi-scan Pro.



[ FIGURE IV.26 : RESISTANCE MEASUREMENT ]

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Like [figure IV. ] after selecting SET ZERO, with connection Of oilloscope probe, it controls zero point.

AMP

Current measurement is same as voltage measurement.  
A proper current probe should be needed in this mode.

TEMP

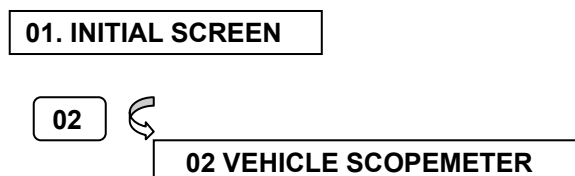
Depressing TEMP key to measure temperature and it's  
Procedures are same as voltage measurement mode.  
A proper temperature probe should be needed in this mode.

PRES

Depressing PRES key to measure pressure and it's  
procedures are same as voltage measurement mode.  
A proper pressure probe should be needed in this mode.

## 6. ACTUATOR DRIVING

### 6-1. OPERATION FLOW



05



2. TOOL BOX(DUOM/SCOPE)	
01. ENGINE	
02. AUTOMATIC TRANSAXLE	
03. OSCILLOSCOPE	
04. METER (V, F, R, A, T, P)	
05. ACTUATOR DRIVING	
06. SENSOR SIMULATOR	

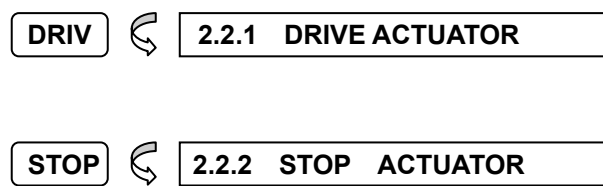
[FLOW IV.5 : ACTUATOR DRIVING ]

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2.6 ACTUATOR DRIVING		
FREQUENCY	ON DUTY	PERIOD
15	5	66.67
Hz	%	mS
CHANNEL A ONLY		
DRIV	STOP	

[ FIGURE IV.27 : ACTUATOR DRIVING ]



## 6-2. MODE APPLICATION

Actuator can be forcibly driven by direct Hi-Scan Pro ON/OFF Control without the need for ECM communication.

The setting Parameters may be changed by using **LEFT** / **RIGHT** keys to select [ FREQUENCY ] / [ON DUTY] and the **UP** / **DOWN** keys to select the setting value. Adjusting the [FREQUENCY] results in an automatic calculation of the [PERIOD] which will be displayed on screen.

#### **DRIV**

Starts the actuator driving function using the selected parameters. During the driving function, the message “NOW DRIVING” is displayed.

Circuit protection for the sensor output will detect if the output signal is inhibited. In this case, the following message will be displayed. At this time, pressing the **YES** key activates actuator again. And the **NO** key terminates actuator driving

**OUTPUT SIGNAL IS INHIBITED  
CHECK CONNECTION, PRESS[Y/N]**

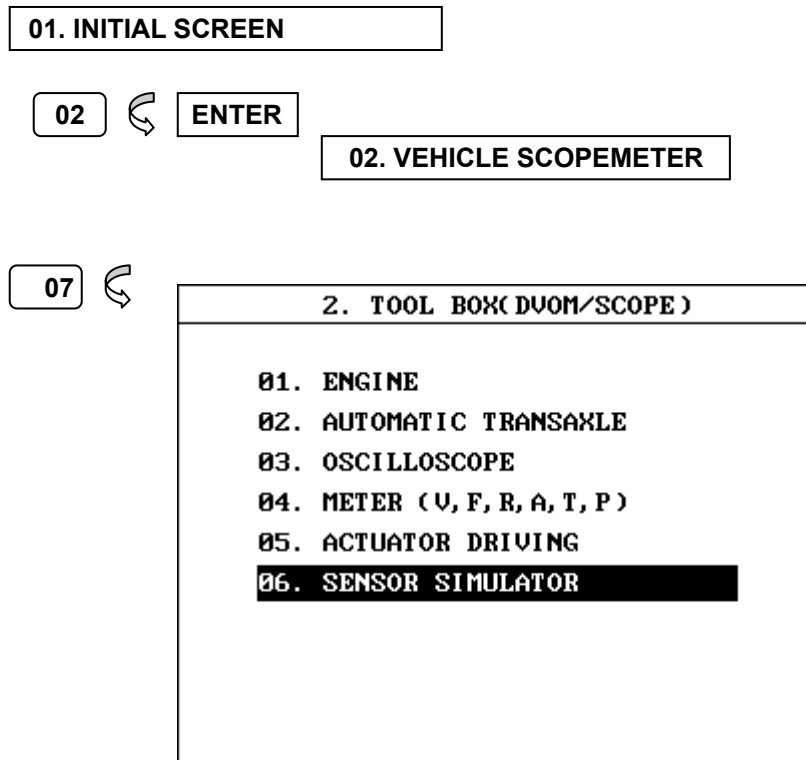
#### **STOP**

Halts the driving function. Changes to the driving control parameters can only be made once the driving function has been stopped.



## 7. SENSOR SIMULATOR

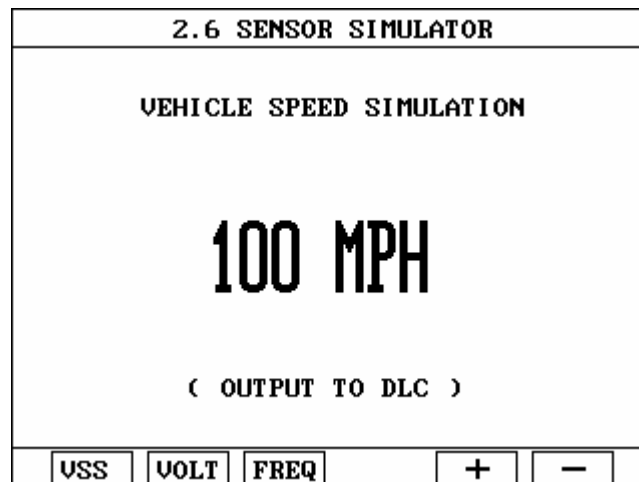
### 7-1. OPERATION FLOW



[ FLOW.6 : SENSOR SIMULATOR DIAGNOSIS MODE ]

Vehicle speed sensor simulation, simulation of voltage and simulation of frequency are available in this mode.

## 7-2. OPERATION FLOW



[ FIGURE IV.28 : VEHICLE SPEED SIMULATION ]

**VSS**

Activating the vehicle speed simulation which generates a simulated speed sensor voltage through the DLC

The simulated speed may be changed by pressing the  and  keys. A value between 0 and 255km/h in 1km/h steps can be selected. The unit of measure may be changed from km/h, to MPH through DATA SETUP option

※Note) only available for electronic type(please refer to shop manual )

**VOLT**

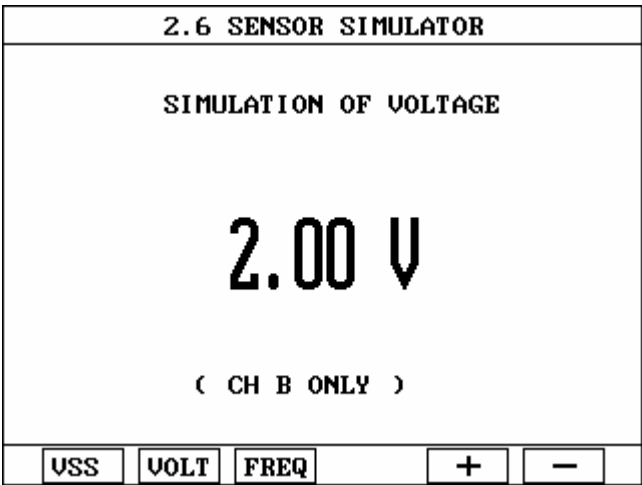
Pressing this key activates sensor output voltage simulation. The voltage generated through channel B and can be Increase or decrease by using the  or  keys.

If that set voltage and the applied voltage differ by less than 10%. Voltage feedback control is maintained by Hi-scan Pro

If the difference exceeds 10%, the following message is  
Displayed and no voltage output occurs.  
Simulation Signal is distorted.  
Check connect, press [ENTER]

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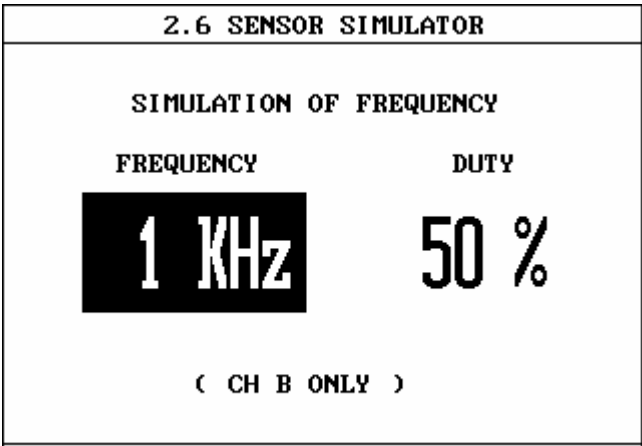


[ FIGURE IV.29 : SIMULATION OF VOLTAGE ]

FREQ

Pressing this key activates sensor frequency/duty output simulation. The frequency generated through channel B can be set using the **+** or **-** key in steps of 5 Hz or 1% Frequency and/or duty can be generated by using **SLCT** key to select either frequency or duty as required. The output range of this simulation is 100 KHz for frequency and 0-100% for duty.

A typical example of the frequency output simulation screen is shown in figure [IV.30].



[ FIGURE IV.30 : SIMULATION OF FREQUENCY]2

IV. TOOL BOX

*Hi-scan Pro*

## **V. CARB OBD-II DIAGNOSIS**

- 1. CONNECTION METHOD**
- 2. COMMUNICATION INTERFACE**
- 3. READINESS TEST**
- 4. CURRENT DATA**
- 5. DIAGNOSTIC TROUBLE CODES**
- 6. FREEZE FRAME DATA**
- 7. EXPANDED DIAG. PROTOCOL**
- 8. 02 TEST RESULTS**
- 9. MONITORING TEST RESULTS**

**10. COMBINATION DISPLAY**

**11. ECU INFORMATION**

**12. PENDING ECU**

#### **IV. CARB OBD-II DIAGNOSIS**

**V – 2**

### **1. CONNECTION METHOD**

**For vehicles with OBD-II communications protocol, power is supplied from the DLC terminal through the DLC cable Without the need for an additional power supply.**

**For these vehicles connection of the DLC CABLE 16 to the Hi-scan Pro and the vehicle data link terminals is all that is Required.**

***Hi-scan Pro* OPERATION GUIDE**

**V – 3**

[ Figure V.1 : CARB OBD-II MODE CONNECTION ]

V. CARB OBD-II DIAGNOSIS

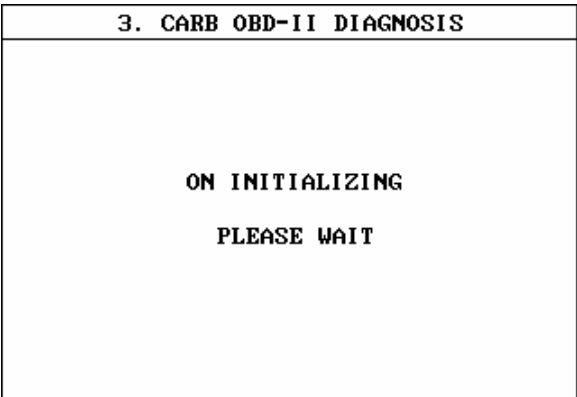
V – 4

2. COMMUNICATION INTERFACE

2-1. OPERATION FLOW

0.1 INITIAL SCREEN

03 ↺





Success in First initializing



3.0 CARB OBD-II DIAGNOSIS

Failure in First initializing



REPETITION OF INITIALZING  
PROCEDURE

[ FLOW V.1 : COMM. INITIAL SUB-MSR IN/OUT FLOW ]

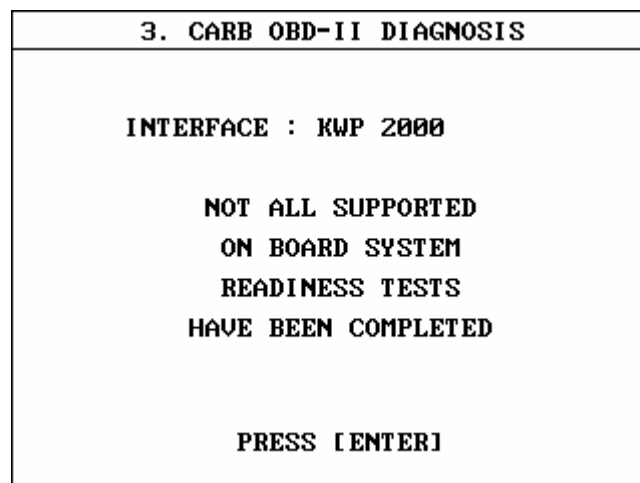
## 2-2. MODE APPLICATION

When CARB OBD-II DIAGNOSIS is selected, Hi-scan automatically searches for vehicle interfaces which apply to OBD-II functions.

During initialization, a process message is displayed. If the Initialization fails because no interfaces have been found, Hi-scan Pro repeats the initialization process and displays the Following message. The user may terminate this process by Pressing **ESC**

RETRY 1 TIMES

When a communication interface is located, Hi-scan Pro Displays the figure V.2 or V.3 according to the result of the on Board- system-readiness-tests.



[Figure V.2 : INITIALIZATION (NOT COMPLETED) ]

## V. CARB OBD-II DIAGNOSIS

<b>3. CARB OBD-II DIAGNOSIS</b>
 <b>INTERFACE : KWP 2000</b>  <b>ALL SUPPORTED ON BOARD SYSTEM READINESS TESTS HAVE BEEN COMPLETED</b>  <b>PRESS [ENTER]</b>

[ Figure V.3 : INITIALIZATION (COMPLETED) ]

## 6. READINESS TEST

### 3-1 OPERATION FLOW

#### 0.1 INITIAL SCREEN



03

Automatic Search for communication Interface



Refer to "Searching for Communication Interface"

#### 3.0 CARB OBD II DIAGNOSIS

01



3.1 READINESS TEST		
2#	NUMBER OF DTC	0
2*	MIL STATUS	OFF
2*	MISFIRE MONITORING	SUPPORTED
2*	FUEL SYS.MONITORING	SUPPORTED
2*	COMPONENT MONITORING	SUPPORTED
2#	CATALYST	NOT CMPLTD
2*	HEATED CATALYST	NOT APPLIC
2#	EVAP.PURGE SYSTEM	NOT CMPLTD
MODULE ID : 11		
	DMID	SMID

DMID



3.1.1 DISPLAY MODULE ID

SMID



3.1.2 SELECT MODULE

[ FLOW V.2 : READINESS TEST MODE IN/OUT FLOW ]

### 3-2. MODE APPLICATION

The type and result of the READINESS TESTS supported by more than one MODULE within the vehicle will be displayed. And the number of DTC and the state of MIL(Malfunction Indicator Lamp) are displayed.

Where several modules respond to each TEST, the number Of responding modules along with an indicator will be displayed. The indicator takes the form of an '\*' or '#' symbol.

'\*' indicates that two or more modules have responded with the same value.

'#' indicates that two or more modules have responded with different values.

A typical illustration of the readiness TEST appears at figure V.4

3.1 READINESS TEST		
2#	NUMBER OF DTC	0
2*	MIL STATUS	OFF
2*	MISFIRE MONITORING	SUPPORTED
2*	FUEL SYS.MONITORING	SUPPORTED
2*	COMPONENT MONITORING	SUPPORTED
2#	CATALYST	NOT CMPLTD
2*	HEATED CATALYST	NOT APPLIC
2#	EVAP.PURGE SYSTEM	NOT CMPLTD
MODULE ID : 11		
DMID	SMID	

[ Figure V.4 : READINESS TEST ]

Using the **UP** / **DOWN** key permits scrolling of the Displayed data.

**DMID** Displaying the Module ID of the test item selected by **UP** / **DOWN** key.

**SMID** Displaying the supporting items, sorted according to the Module ID. A typical screen display is illustrated at figure V.5.

3.1 READINESS TEST		
<b>11</b>	<b>NUMBER OF DTC</b>	<b>0</b>
18	MIL STATUS	OFF
	MISFIRE MONITORING	SUPPORTED
	FUEL SYS.MONITORING	SUPPORTED
	COMPONENT MONITORING	SUPPORTED
	CATALYST	NOT CMPLTD
	HEATED CATALYST	NOT APPLIC
	EVAP.PURGE SYSTEM	NOT CMPLTD

[ Figure V.5:READINESS TEST(SMID) ]

If you want to know items corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** key, and then use **UP** / **DOWN** key to select Module ID and press **ENTER** key.

**ESC** Causing the display to return.

## V. CARB OBD-II DIAGNOSIS

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### 4. CURRENT DATA

#### 4-1. OPERATION FLOW

##### 0.1 INITIAL SCREEN

03



Automatic Search for communication Interface



Refer to “Searching for Communication Interface”

##### 3.0 CARB OBD II DIAGNOSIS

02



3.2 CURRENT DATA			
2×	FUEL SYS.STS - BNK1	OPEN LOOP	▲
2×	FUEL SYS.STS - BNK2	OPEN LOOP	■
2×	CALCULAT.LOAD VALUE.	0.0 %	
2#	COOLANT TEMP. SENSOR	-40 °F	
2#	SHORT TERM FUEL (B1)	0.0 %	
2#	LONG TERM FUEL (B1)	0.0 %	
2#	SHORT TERM FUEL (B2)	0.0 %	
2#	LONG TERM FUEL (B2)	0.0 %	▼
MODULE ID : 11			
	DMID	SMID	SPID

DMID	↩	3.2.1 DISPLAY MODULE ID
SMID	↩	3.2.2 SELECT MODULE
SPID	↩	3.2.3 SELECT PID

[ FLOW V.3 : CURRENT DATA MODE IN/OUT FLOW ]

V – 11

## 4.2 MODE APPLICATION

The CURRENT DATA MODE allows for sensor values and switch states to be displayed, based upon the concept that one item may be supported by several modules. Supporting module information is displayed in this mode.

A typical CURRENT DATA screen display appears at figure V.6.

3.2 CURRENT DATA			
2*	FUEL SYS.STS - BNK1	OPEN LOOP	▲
2*	FUEL SYS.STS - BNK2	OPEN LOOP	■
2*	CALCULAT.LOAD VALUE.	0.0 %	
2#	COOLANT TEMP. SENSOR	-40 °F	
2#	SHORT TERM FUEL (B1)	0.0 %	
2#	LONG TERM FUEL (B1)	0.0 %	
2#	SHORT TERM FUEL (B2)	0.0 %	
2#	LONG TERM FUEL (B2)	0.0 %	▼
MODULE ID : 11			
	DMID	SMID	SPID



[ Figure V.6 : CURRENT DATA ]

V. CARB OBD-II DIAGNOSIS  
V – 12

Hi-scan Pro display all of the PID names supported by several modules and the status in the center column of the display. In the left hand column, an indicator is displayed. The indicator takes the form of an '\*', '#', or '-' symbol.

'\*' indicates that two or more modules have responded with the same value.

'#' indicates that two or more modules have responded with different values.

'-' indicates no response from two or more modules.

The **UP** / **DOWN** key can be used to scroll through the data to highlight items to be actioned by soft function keys.

<b>DMID</b>	Displaying the Module Ids for the selected item. The <b>UP</b> / <b>DOWN</b> key may be used to scroll through the data.
-------------	--

<b>SMID</b>	Displaying the supported items sorted according to Module
-------------	---

ID. Using this function it is possible to view the module ID supporting an item group.

If you want to know items corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** Key, and then use **UP** / **DOWN** key to select Module ID And press **ENTER** key.

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### **SPID**

This function allows for selective data display based upon user selection of the required data. Moving the cursor to the required line(s) and pressing the soft function key. **SLCT** . Once all of the required items have been selected, pressing **ENTER** will cause them to be displayed. Selected items are marked with an asterisk. Items can be deselected by depressing **SLCT** key again.

Pressing **ENTER** without item selection will display all items.

3.2 CURRENT DATA	
* FUEL SYS.STS - BNK1	▲
* FUEL SYS.STS - BNK2	■
* CALCULAT.LOAD VALUE.	
* COOLANT TEMP. SENSOR	
SHORT TERM FUEL (B1)	
LONG TERM FUEL (B1)	
SHORT TERM FUEL (B2)	
LONG TERM FUEL (B2)	▼
AFTER SELECT ITEMS, PRESS [ENTER]	
SLCT	

3.2 CURRENT DATA	
2* FUEL SYS.STS - BNK1	OPEN LOOP ▲
2* FUEL SYS.STS - BNK2	OPEN LOOP
2* CALCULAT.LOAD VALUE.	0.0 %
2# COOLANT TEMP. SENSOR	-40 °F ▼
MODULE ID : 11	
DMID	SMID SPID

[ Figure V.6 : CURRENT DATA(SPID) ]

V. CARB OBD-II DIAGNOSIS

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## 5. DIAGNOSTIC TROUBLE CODES

### 5-1. OPERATION FLOW

0.1 INITIAL SCREEN

03



Automatic Search for communication Interface



Refer to “Searching for Communication Interface”

3.0 CARB OBD II DIAGNOSIS

03



3.3 DIAGNOSTIC TROUBLE CODES	
P0750 PCSV-ELECTRICAL	
P0752 SCSV A-ABNORMAL	
MODULE ID : 18	
SMID	ERAS

SMID



3.3.1 SELECT MODULE

ERAS



3.3.2 CLEAR FAULT CODES

[ FLOW V.4 : DIAGNOSTIC TROUBLE CODES MODE IN/OUT FLOW ]

## *Hi-scan Pro* OPERATION GUIDE

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### 5-2. MODE APPLICATION

At this level, DIAGNOSTIC TROUBLE CODES (DTC) are Displayed based upon the concept that one DTC may be supported by several modules. Supporting module information is displayed in this mode.

3.3 DIAGNOSTIC TROUBLE CODES	
P0750 PCSV-ELECTRICAL	
P0752 SCSV A-ABNORMAL	
MODULE ID : 18	

[ Figure V.8: DTC SCREEN ]

By using the **UP** / **DOWN** key, the display may be

Hi-scan Pro displays all of the DTCs supported by several modules and the status.

**SMID**

Displaying the DTCs sorted according to module ID. Using this function it is possible to view the Module ID supporting an DTC group.

V. CARB OBD-II DIAGNOSIS

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If you want to know DTCs corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** key, and then use **UP** / **DOWN** key to select Module ID and press **ENTER** key.

**ERAS**

This soft function key will clear the DTC currently held in the

memory of ECM. If this option is selected, a message requesting confirmation of the **ETAS** request will be displayed. The **YES** or **NO** key should be used to confirm or cancel the request to clear the current DTC.

**NOTE THAT ALL MODULES MUST BE IN THE “IGNITION ON, ENGINE OFF” MODE FOR Hi-scan Pro TO BE ABLE TO ERASE DTCs. IF ANY OTHER CONDITION EXISTS. Hi-scan Pro WILL NOT ERASE CODES.**

## **6. FREEZE FRAME DATA**

## 6-1. OPERATION FLOW

0.1 INITIAL SCREEN

03 ↶

Automatic Search for communication Interface

↶ Refer to “Searching for Communication Interface”

3.0 CARB OBD II DIAGNOSIS

04 ↶

3.4 FREEZE FRAME DATA		
3#	FUEL SYS.STS - BNK1	NOT USED
3#	FUEL SYS.STS - BNK2	NOT USED
3#	LONG TERM FUEL (B2)	0.0 %
3#	FUEL PRESSURE	384 kPa
3#	INTAKE MAP	128 kPa
3#	ABSOLUTE THROTTLE P.	50.2 %
3#	SECONDARY AIR STATUS	NOT USED
3#	O2 SNSR VOLT.(B2/S2)	0.640 V
MODULE ID : 17		
	DMID	SMID SPID

DMID ↶ 3.4.1 DISPLAY MODULE ID

SMID ↶ 3.4.2 SELECT MODULE

SPID ↶ 3.4.3 SELECT PID

[ FLOW V.5 : FREEZE FRAME DATA MODE IN/OUT FLOW ]

## 6-2. MODE APPLICATION

The FREEZE FRAME DATA displays the data values stored in the ECM at the point when the first DTC is detected.

A typical screen display is illustrated at figure V.9.

3.4 FREEZE FRAME DATA			▲
3#	FUEL SYS.STS - BNK1	NOT USED	■
3#	FUEL SYS.STS - BNK2	NOT USED	
3#	LONG TERM FUEL (B2)	0.0 %	
3#	FUEL PRESSURE	384 kPa	
3#	INTAKE MAP	128 kPa	
3#	ABSOLUTE THROTTLE P.	50.2 %	
3#	SECONDARY AIR STATUS	NOT USED	
3#	O2 SNSR VOLT.(B2/S2)	0.640 V	▼
MODULE ID : 17			
DMID	SMID	SPID	

[ Figure V.9:FREEZE FRAME DATA ]

Hi-scan Pro displays all of the Freeze Frame Data for those items supported by several modules and the status in the center column of the display. In the left hand column, an indicator is displayed. The indicator takes the form of an '\*\*', '#', or '-' symbol.

'\*\*' indicates that two or more modules have responded with the same value.



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'#' indicates that two or more modules have responded with different values.

'-' indicates no response from two or more modules.

The **UP** / **DOWN** key can be used to scroll through the Data to highlight items to be actioned by soft function keys.

**DMID**

is used to display the Module Ids for the selected item. The **UP** / **DOWN** key may be used to scroll through the data.

**SMID**

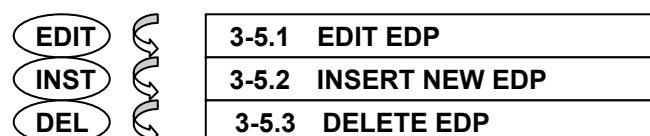
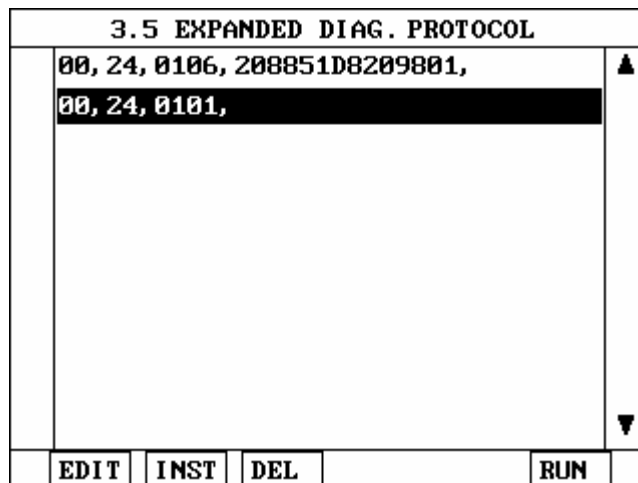
is used to display the supported items sorted according to module ID. Using this function it is possible to view the Module ID supporting an item group.

If you want to know items corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** key, and then use **UP** / **DOWN** key to select Module ID and press **ENTER** key.

**SPID**

This function allows for selective data display based upon required line(s) and press the soft function key. Once all of the required items have been selected, pressing **ENTER** will cause them to be displayed. Selected items are marked with an asterisk. Items can be deselected by depressing **SLCT** key again.

## 7-1. OPERATION FLOW





3-5.4 RUN EDP

[ FLOW V.6 : EXPANDED DIAG. PROTOCOL MODE IN/OUT FLOW]

## 7-2. MODE APPLICATION

The purpose of EXPANDED DIAG. PROTOCOL(here-in-after “EDP”) is to define encoding techniques which can perform the following functions.

- 1) Function that describes the messages to be transmitted to the vehicle and the transmitting method to SAE J1978 OBD II Scan Tool.
- 2) Function that describes the message that scan tool will receive and process to SAE J1978 OBD II Scan Tool.
- 3) Function that describes the way to process the data included in the received messages to SAE J1978 OBD II Scan Tool.

In EDP definition, there are generally 4 groups: control type, transmit type, receive only type and miscellaneous type.

General format of each is as followings.

**CONTROL TYPE** definition

<id>,<type>,<DSV>

**TRANSMIT TYPE** definitions

<id>,<type>,<tx msg>, <rx filter>

<rx data processing info>,<DSV>

**RECEIVE ONLY TYPE definitions**

<id>,<type>,<rx filter>,<rx data processing info>,<DSV>

**MISCELLANEOUS TYPE definitions**

<id>,<type and additional info>,<DSV>

**V. CARB OBD-II DIAGNOSIS**

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For more detailed information of these EDP definitions and meanings of each field, please refer to related documents such as AE J1978. In this operation guide, EDP edit and execution method are described only.

A screen example of the EDP is as follows :

3.5 EXPANDED DIAG. PROTOCOL		
00, 24, 0101,		
A = [F1], B = [F2], C = [F3] D = [F4], E = [F5], F = [F6] , = [YES], / = [NO], DELETE = [UNDO]		

[ Figure V.9 : EDP SCREEN ]

Stored EDP DEFINITIONS are displayed in default screen.

Each DEFINITION can include 256 characters and 15 definitions can be stored. For more than 34 words (maximum display line length for EDP), horizontal scroll can be performed by **LEFT** / **RIGHT** key.

## ***Ht-scan Pro* OPERATION GUIDE**

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You can scroll display by **UP** / **DOWN** key. And to edit and execute EDP, you can apply advanced application by using soft function keys of which usages are as follows :

**EDIT**

This key is used to access edit mode of EDP. When **EDIT** key is pressed, following edit mode screen will be displayed.

<b>3.5 EXPANDED DIAG. PROTOCOL</b>
<b>20, 24, 0101,</b>
<b>A = [F1], B = [F2], C = [F3]</b> <b>D = [F4], E = [F5], F = [F6]</b> <b>, = [YES], / = [NO], DELETE = [UNDO]</b>

[ Figure V.10 : EDP SCREEN (EDIT) ]

In this edit mode screen, you can edit EDP with following key operation.

F1	:	input character 'A'
F2	:	input character 'B'
F3	:	input character 'C'
F4	:	input character 'D'
F5	:	input character 'E'
F6	:	input character 'F'
YES	:	input character ','
NO	:	input character '/'
UNDO	:	input character

## V. CARB OBD II DIAGNOSIS

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You must finish all definition by ',' at the end. To escape from EDIT mode, press **ESC** key

**INST**

key is used to insert new EDP. When **INST** key is pressed, edit mode screen will be displayed.

**EDIT** /

**INST**

If al given definition id is already associated with an EDP definition when another message definition using the same id is successfully entered then the new definition shall be added.

When the number of stored definition exceeds 15, the following message will be displayed.

**EDP DEFINITION IS FULL**

PRESS [ENTER]

The cursor can be moved to the left or right by **LEFT** / **RIGHT** keys and moved to the up or down by **UP** / **DOWN** keys.

After editing, if **ENTER** key is depressed, Hi-scan Pro checks whether the definition is entered successfully or not. If the definition includes errors, the following message will be displayed. For the message, if **ENTER** key depressed, the definition will be saved though that is wrong definition. If **ESC** entered, the definition will not saved.

THIS EDP IS NOT SUPPORTED  
TO SAVE ANYWAY, PRESS [ENTER]

**DEL** key is used to delete EDP which is selected by cursor.

## *Hi-scan Pro* OPERATION GUIDE

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**RUN** key is used to run EDP . If **RUN** key is pressed, selected EDP is transmitted to the vehicle and the response will be displayed.

If the definition selected by cursor includes errors the following message will be displayed.

THIS EDP IS NOT SUPPORTED  
PRESS [ ENTER]

Hi-scan supports the following definitions. 12, 13, 14, 19, 1A are Control Definition Types and 20, 21, 24 are Transmit Definition Types.

[ 12 ] terminates the current ISO 9141-2 communication connection and begin the ISO 9141-2 addressing and initialization sequence with the given address

12 xx      xx = ISO 9141-2 address

[ 13 ] define the idle message to be used for ISO 9141-2 communication

13 aa bb ... zz

[ 14 ] define the shop 9141 communication message to be used to terminate ISO 9141-2 communication.

14 aa bb ... zz

[ 19 ] delete all current definitions

19

## V. CARB OBD-II DIAGNOSIS

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[ 1A ] delete a given definition id

1A xx

If several messages with the same definition id is in the memory, Hi-scan Pro deletes the oldest definition.



[ 20 ] transmit this message once per selection.

User should enter '20' and ',' and then message

[ 21 ] transmit message repeatedly at standard rate once selected, until selected again, at which time stop the repeated retransmissions.

User should enter '21' and ',' and then message.

Hi-scan Pro transmit the message included this definition and display the results in hexadecimal form.

The scroll of display can be hold by **ENTER** key, and can be restarted by depressing **ENTER** key again.

[ 24 ] process message as a SAE J1979 request.

Hi-scan Pro transmit the message included this definition and display the results in hexadecimal form.

The scroll of display can be hold by **ENTER** key, and can be restarted by depressing **ENTER** key again.

For more detailed information such as DEFINITION ID, TYPE etc., please refer to 'SAE J2205' separately.

## 8. 02 TEST RESULTS

### 8-1. OPERATION FLOW

## 0.1 INITIAL SCREEN

03



Automatic Search for communication Interface



Refer to 'Searching for Communication Interface'

## 3.0 CARB OBD II DIAGNOSIS

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### 3.6 O2 TEST RESULTS

**BANK1 - SENSOR 1**

BANK1 - SENSOR 2

BANK2 - SENSOR 1

BANK2 - SENSOR 2

ENTER



DISPLAY TEST RESULTS

[ FLOW V.7 : O2 TEST RESULT MODE IN/OUT FLOW ]

## V. CARB OBD-II DIAGNOSIS

## 8-2 MODE APPLICATION

The results of the of on board oxygen sensor monitoring test can be displayed in this mode. Note that only items related to the oxygen sensor will be displayed.

A typical screen display is illustrated t figure V.12.

3.6 O2 TEST RESULTS		
3#	R -> L O2S VOLTAGE	0.520 V
3#	L -> R O2S VOLTAGE	0.520 V
3#	LOW VOL. - SW.TIME	0.520 V
3#	HIGH VOL. - SW.TIME	0.520 V
3#	R -> L SWITCH TIME	0.000 sec
3#	L -> R SWITCH TIME	0.000 sec
3#	O2S TRANSITION TIME	0.00 sec
3#	TEST ID \$30	0.00 sec
MODULE ID : 11		

[ Figure V.12 : O2 TEST RESULTS ]

Hi-scan Pro display all of the test names for those items supported by several modules and the status in the center column of the display. In the left hand column, an indicator is displayed. The indicator takes the form of an “\*” “#” or “-” symbol.

“\*” indicates that two or more modules have responded with the same value.

'#' indicates that two or more modules have responded with different values.

'-' indicates no response from two or more modules.

The **UP** / **DOWN** key can be used to scroll through the data to highlight items to be actioned by soft function keys.

#### DMID

Displayign the Module Ids for the selected test item. The **UP** / **DOWN** key may be used to scroll through the data.

#### SMID

Displayign the supported items sorted according to module ID. Using this function it is possible to view the module ID supporting an item group.

If you want to know items corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** key, and then use **UP** / **DOWN** key to select Module ID and press **ENTER** key

#### STID

This function allows for selective data display based upon user selection of the required data. Move the cursor to the required line(s) and press the soft function key. Once all of the required items have been selected, pressing **ENTER** will cause them to be displayed. Selected items are marked with an asterisk. Items can be deselected by the same process.

## 9. MONITORING TEST RESULTS

### 9-1. OPERATION FLOW

#### 0.1 INITIAL SCREEN

03



Automatic Search for communication Interface



Refer to “Searching for Communication Interface”

#### 3.0 CARB OBD II DIAGNOSIS

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3.7 MONITORING TEST RESULTS				
2#	TEST ID \$01	00	00	78 00
8#	TEST ID \$02	00	00	00 00
7#	TEST ID \$05	00	00	00 23
1	TEST ID \$09	00	00	00 A4
4#	TEST ID \$0B	00	00	00 2B
1	TEST ID \$0D	00	00	00 00
COMPONENT ID : FF				
DCID		STID		

DCID



3.7.1 DISPLAY COMPONENT ID

STID



3.7.2 SELECT TEST ID

## 9-2. MODE APPLICATION

The results of on board monitoring tests conducted during normal driving is displayed this mode.

If vehicle manufacturer is responsible to assign test IDs and component IDs for tests of different system and components. If no TEST which vehicle manufacturer supports, Hi-scan displays following message in the screen:

THIS TEST MODES IS NOT SUPPORTED  
PRESS [ ESC ]

A typical screen display is illustrated at figure V.13.

3.7 MONITORING TEST RESULTS				
2#	TEST ID \$01	00	00	78 00
8#	TEST ID \$02	00	00	00 00
7#	TEST ID \$05	00	00	00 23
1	TEST ID \$09	00	00	00 A4
4#	TEST ID \$0B	00	00	00 2B
1	TEST ID \$0D	00	00	00 00
COMPONENT ID : FF				
DCID	STID			

[ Figure V.13 : MONITORING TEST RESULTS ]

## V. CARB OBD-II DIAGNOSIS

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Hi-scan displays all of the Component ID for those items supported by several components and the status in the center column of the display. In the left hand column, an indicator is displayed. The indicator takes the form of an '\*\*' '#', or '-' symbol.

'\*\*' indicates that two or more components have responded with the same value.

'#' indicates that two or more components have responded with different values.

'-' indicates no response from two or more components.

The **UP** / **DOWN** key can be used to scroll through the data to highlight items to be actioned by soft function keys.

### DCID

is used to display the Component Ids for the elected test item. The **UP** / **DOWN** key may be used to scroll through the data.

### STID

This function allows for selective data display based upon user selection of the required data. Moving the cursor to the required line(s) and pressing the soft function key. Once all

of the required items have been selected, pressing **ENTER** will cause them to be displayed. Selected items are marked with an asterisk. Items can be deselected by the same process.

## 10. COMBINATION DISPLAY

### 10-1. OPERATION FLOW

0.1 INITIAL SCREEN

03



Automatic Search for communication Interface



Refer to “Searching for Communication Interface”

3.0 CARB OBD II DIAGNOSIS

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3.8 COMBINATION DISPLAY					
CURRENT DATA					
3#	FUEL SYS.STS - BNK1	NOT USED			▲
3#	FUEL SYS.STS - BNK2	NOT USED			
3#	LONG TERM FUEL (B2)	0.0 %			
3#	FUEL PRESSURE	384 kPa			▼
B2-S2		O2 TEST RESULTS		17	
3#	R -> L O2S VOLTAGE	0.640 V			▲
3#	L -> R O2S VOLTAGE	0.640 V			■
3#	LOW VOL. - SW.TIME	0.640 V			
3#	O2S TRANSITION TIME	5.12 sec			▼
	DMID	CURR	DTC	FRZE	O2TS MONI



DMID	3.8. 1	DISPLAY MODULE ID
CURR	3.8. 2	CURRENT DATA
DTC	3.8. 3	DIAG. TROUBLE CODES
FRZE	3.8. 4	FREEZE FRAME DATA
O2TS	3.8. 5	O2 TEST RESULTS
MONI	3.8. 6	MONITORING TEST RESULTS

[ FLOW V.9 : COMBINATION DISPLAY MODE IN/OUT FOLW ]

## V. CARB OBD-II DIAGNOSIS

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### 10.2 MODE APPLICATION

This facility allows for the display of the following simultaneously:

- Current data items
- Available DTC
- Available freeze frame data items
- Test parameters and results for oxygen sensor tests and monitoring tests

The default screen is CURRENT DATA and DIAGNOSTIC TROUBLE CODES (DTC).

The **UP** / **DOWN** key may be used to scroll the data contained in the same window as the cursor.

Where a soft function key related to the current window is used, the cursor will move to the selected area.

Where a soft function key related to the current window is used, the window which does not contain the cursor will be replaced with the soft function key related information.

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A typical COMBINATION DISPLAY screen is illustrated at figure V.14.

3.8 COMBINATION DISPLAY						
CURRENT DATA						
3#	FUEL SYS.STS - BNK1	NOT USED				▲
3#	FUEL SYS.STS - BNK2	NOT USED				
3#	LONG TERM FUEL (B2)	0.0 %				
3#	FUEL PRESSURE	384 kPa				▼
B2-S2		O2 TEST RESULTS			17	
3#	R -> L O2S VOLTAGE	0.640 V				▲
3#	L -> R O2S VOLTAGE	0.640 V				■
3#	LOW VOL. - SW.TIME	0.640 V				
3#	O2S TRANSITION TIME	5.12 sec				▼
	DMID	CURR	DTC	FRZE	O2TS	MONI

[ Figure V.14 : COMBINATION DISPLAY ]

The **UP** / **DOWN** key is used to scroll through the display.

**DMID**

This soft function key is used to display the module ID for the selected item. Item selection is made by means of the **UP** / **DOWN** key. Pressing the **DMID** key at the highlighted line will display all of the module ID for that item.

**CURR**

Taking the cursor to the CURRENT DATA AREA. If the CURRENT DATA is being displayed, the **CURR** key will move the cursor to that window. If the CURRENT DATA is not being displayed, the window not containing the cursor will be replaced with the CURRENT DATA display.

## V. CARB OBD-II DIAGNOSIS

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**DTC**

DIAGNOSTIC TROUBLE CODES

**FRZE**

FREEZE FRAME DATA

**O2TS**

OXYGEN SENSOR TEST RESULTS

**MONI**

MONITORING TEST RESULTS

Work in a similar manner to CURR except that the screen replaced is that selected by the soft function key description.

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## **11. ECU INFORMATION**

### **11-1. OPERATION FLOW**

## 0.2 INITIAL SCREEN

04



Automatic Search for communication Interface



Refer to “Searching for Communication Interface”

## 3.0 CARB OBD II DIAGNOSIS

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3.9 ECU INFORMATION	
MODULE ID :	<b>11</b>
CHECK SUM :	
	0 0 bb ca
CALIBRATION ID :	
	P R E 6
	5 2 C 3
	- - - -

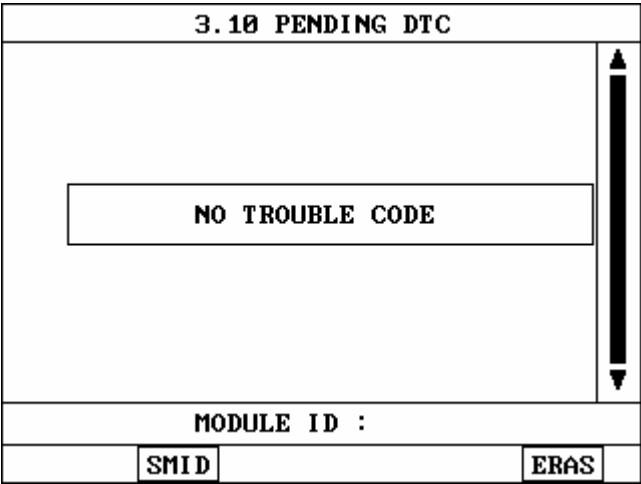
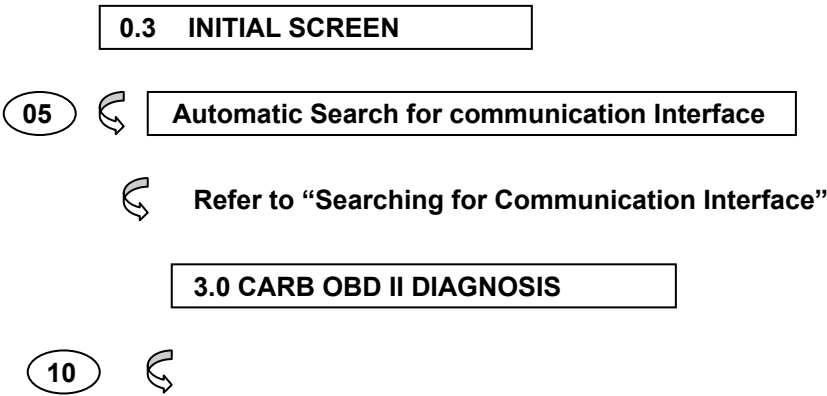
[ FLOW V.11 : ECU INFORMATION MODE]

## V. CARB OBD-II DIAGNOSIS

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# 11. PENDING DTC

## 11-1. OPERATION FLOW



[ FLOW V.12 : PENDING DTC MODE ]

## 10.2 MODE APPLICATION

ECU is monitoring each sensor. When monitoring output is abnormal, it shows you DTC and when monitoring output is normal, it automatically removes records. But this [ 03. DIAGNOSTIC TROUBLE CODES ] can be shown even for temporary problem.

**SMID**

is used to display the supported items sorted according to module ID. Using this function it is possible to view the Module ID supporting an item group.

If you want to know items corresponding to another Module ID, move cursor to display area of Module ID with **LEFT** key, and then use **UP** / **DOWN** key to select Module ID and press **ENTER** key.

## V. CARB OBD-II DIAGNOSIS

*Hi-scan Pro*



## **VI. FLIGHT RECORD REVIEW**

- 1. OPERATION FLOW**
- 8. MODE APPLICATION**

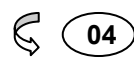
VI. FLIGHT RECORD REVIEW

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7. OPERATION FLOW

1. OPERATION FLOW

0.1 INITIAL SCREEN



FLIGHT RECORD REVIEW



1.3 FLIGHT RECORD		
11.OXYGEN SENSOR	410	mV
12.MASS.AIR FLOW SNSR	1328	mV
14.THROTTLE P.SENSOR	761	mV
22.ENGINE SPEED	812	rpm
GRPH ◀ HOME ▶ HOME		

**[ FLOW VI.1 : FLIGHT RECORD REVIEW MODE IN/OUT FLOW ]**

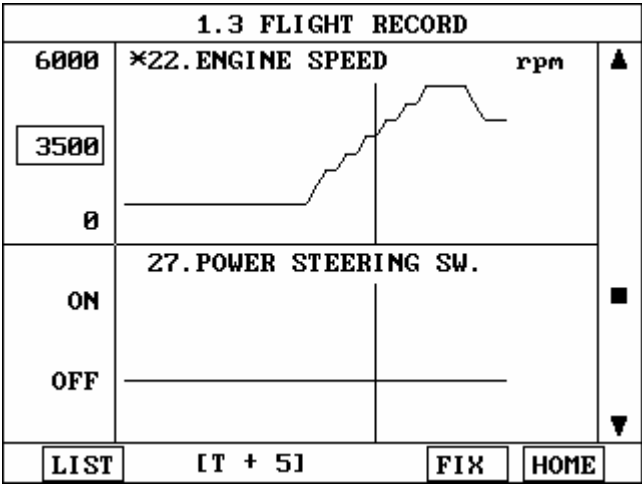
**TRIG**

1.3 FLIGHT RECORD		
11.OXYGEN SENSOR	410	mV
12.MASS.AIR FLOW SNSR	1328	mV
14.THROTTLE P.SENSOR	761	mV
22.ENGINE SPEED	812	rpm
<div> <div>GRPH</div> <div>◀ HOME ▶</div> <div>HOME</div> </div>		

**[Figure VI.1 : FIGHT RECORD (NUMERIC) ]**

VI. FLIGHT RECORD REVIEW  
VI – 4

In this numerical data display, **GRPH** key is used to see graphic views for the items recorded by **FIX** key operation. When two items are selected, a graphical view is as follows.



[ Figure VI.2 : FLIGHT RECORD (GRAPH) ]

[ T+5 ] MEANS SAMPLED TIME INDEX, AND CURRENT ]  
SCREEN DISPLAY THE DATA AFTER 5<sup>TH</sup> SAMPLING  
INDEX THAN TRIGGER POINT.

You can change sampled time index by **UP** or **DOWN** key. In graphic display, current sampled time index position is displayed as vertical line cursor. If this cursor is arrived end of screen, screen will be moved as half page.

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***Hi-scan Pro***

## **VII. SYSTEM SETUP**

**1. CONNECTION METHOD**

**2. SYSTEM COMMUNICATION**

**3. DATA SETUP**

**4. PRINTER SETUP**

**5. SYSTEM TEST**

## **6. METER ZERO SET**

## **VII. SYSTEM SETUP**

**VII – 2**

### **1. CONNECTION METHOD**

**Following five kinds of power supply methods can be used.**

**(1) Cigar lighter power cable**

**(2) Power extension cable**

**(3) DLC cable**

**(4) Internal rechargeable battery**

**(5) AC/DC adapter**

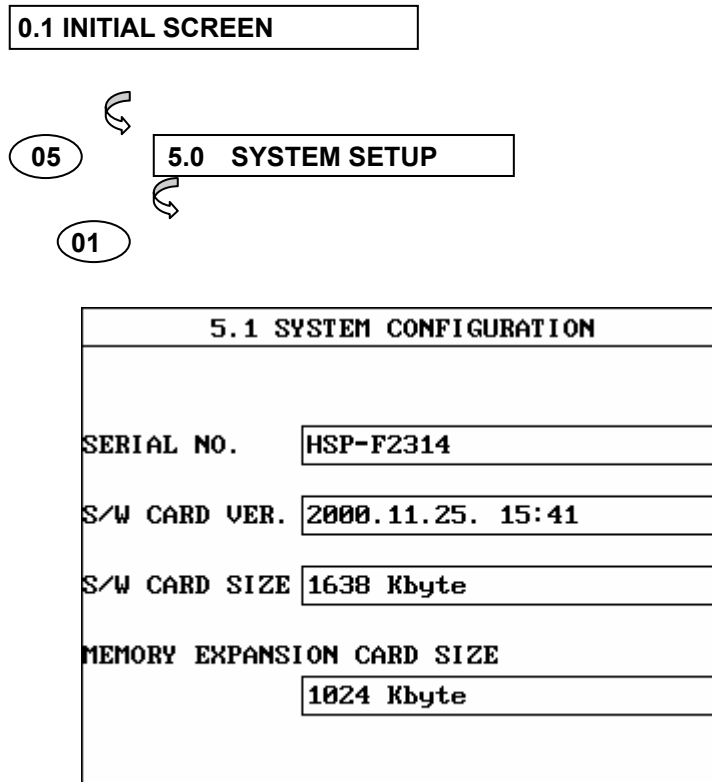


**[ figure VII.1 : SYSTEM SETUP MODE CONNECTION ]**

## **VII. SYSTEM SETUP**

## 2. SYSTEM CONFIGURATION

### 2-1. OPERATION FLOW



[FLOW VII.1 : SYSTEM CONFIGURATION MODE IN/OUT FLOW]

## **2-2. MODE APPLICATION**

This mode displays data for the following items.

### **1) SERIAL NUMBER**

: shows production serial number of your Hi-scan Pro

### **2) SOFTWARE CARD VERSION**

: shows software version of Hi-scan

### **3) SOFTWARE CARD SIZE**

: shows Software card size

### **4) MEMORY EXPANSION CARD SIZE**

: shows memory expansion card size

## 2-3. INSTALLATION OF MEMORY EXPANSION CARD

If the customers use MEMORY EXPANSION CARD purchased in the local area, at first, the card should be formatted. Once the card is formatted, it is not necessary to be formatted again.

The procedure of formatting is as follows;

1. Display the screen of SYSTEM CONFIGURATION function as showed in figure VI.1.

5.1 SYSTEM CONFIGURATION	
SERIAL NO.	HSP-F2314
S/W CARD VER.	2000.11.25. 15:41
S/W CARD SIZE	1638 Kbyte
MEMORY EXPANSION CARD SIZE	1024 Kbyte

[ Figure VII.2 : SYSTEM CONFIGURATION ]

2. Insert the MEMORY EXPANSION CARD to lower slot.  
When the card is inserted, the message “NOW FORMATTING” will be displayed as showed in figure VII.3.

5.1 SYSTEM CONFIGURATION	
SERIAL NO.	HSP-F2314
S/W CARD VER.	2000.11.25. 15:41
S/W CARD SIZE	1638 Kbyte
MEMORY EXPANSION CARD SIZE	NOT INSTALLED

[ Figure VII.2 : SYSTEM CONFIGURATION ]

VII. SYSTEM SETUP

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After formatting, Hi-scan displays the size of MEMORY EXPANSION CARD as showed in figure VI.3.

5.1 SYSTEM CONFIGURATION	
SERIAL NO.	HSP-F2314
S/W CARD VER.	2000.11.25. 15:41
S/W CARD SIZE	1638 Kbyte
MEMORY EXPANSION CARD SIZE	1024 Kbyte

[ Figure VII.4 : SYSTEM CONFIGURATION (CARD SIZE) ]

### 3. DATA SETUP

#### 3-1. OPERATION FLOW

0.1 INITIAL SCREEN

05








5.0 SYSTEM SETUP



02

5.2 DATA SETUP			
1. HOLD LAST SCREEN	<b>NO</b>		
2. SOUND	<b>ON</b>	3. LANGUAGE	<b>BASIC</b>
4. UNIT CONVERSION			
SPEED	<b>MPH</b>	TEMP.	<b>°F</b>
PRESSURE	<b>psi</b>	ANGLE	<b>°</b>
AIR FLOW	<b>gm/s</b>		
5. CENTER TEL.	<input type="text"/>		
6. DEALERSHIP	<input type="text"/>		
7. SELF TEST	<b>YES</b>		

LEFT		LEFT ITEM SELECTION
RIGHT		RIGHT ITEM SELECTION
UP		ITEM VALUE CHANGE +
DOWN		ITEM VALUE CHANGE -
ENTER		CHANGE ITEM SELECTION

[ FLOW VII.2 : DATA SETUP MODE IN/OUT FOLW ]

## VII. SYSTEM SETUP

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### 3.2 MODE APPLICATION

The operating parameters of Hi-scan Pro may be set prior to vehicle testing. The following list details items which are user configurable.

- 1) **HOLE LAST TOOL BOX SCREEN** : Determines whether or not the last screen in **VEHICLE DIAGNOSIS AND SCOPEMETER** mode is saved before power down.
- 2) **SOUND** : Determines whether or not the internal buzzer sounds at each key depression.
- 3) **LANGUAGE** : Determines whether or not a local language is used.
- 4) **UNIT CONVERSION** : The units of measure used by Hi-scan Pro may be selected from either of the following :



Speed	Km/h, MPH
Temperature	Fahrenheit, Centigrade
Pressure	kPa, mmHg, inHg, psi, mbar
Angle	degree, percent
Airflow Volume	gm/s , lb/m

5) CENTER TEL. : The telephone number to which data transmissions can be made.

6) DEALERSHIP : The name of dealer.

7) SELF TEST : Determines whether or not a Self Test is performed at each power up.

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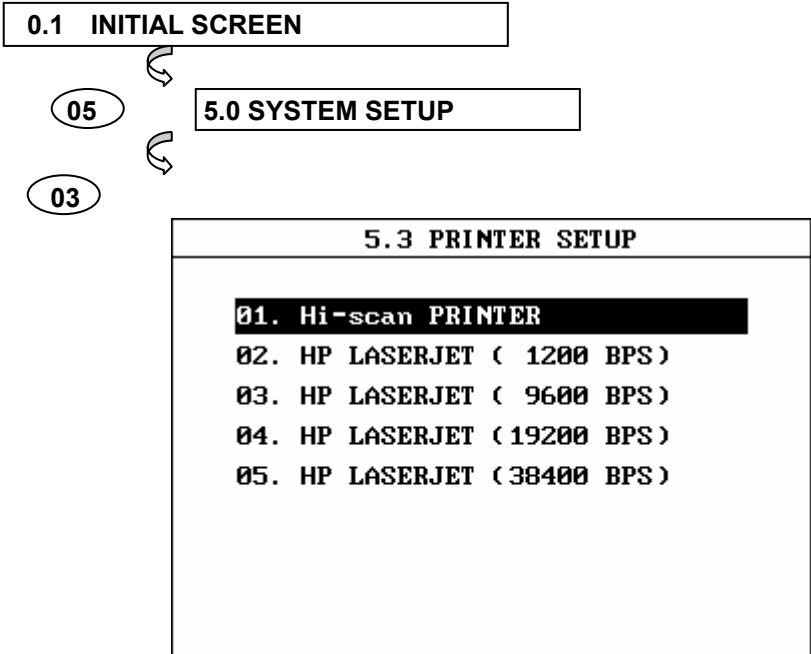
Items are selected by using the **LEFT** / **RIGHT** key, and values may be changed using the **UP** / **DOWN** key.

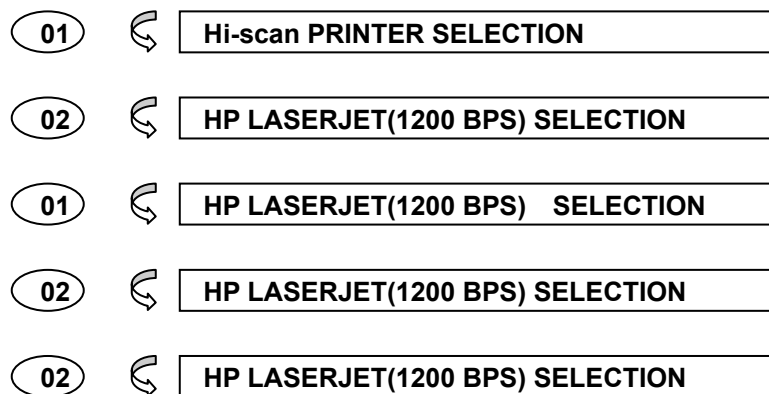
When editing the Delership, the cursor may be moved using the **LEFT** / **RIGHT** key, and the selected value is changed using the **UP** / **DOWN** key to move to the next or previous character in the character set ( 1, 2, 3 ..., 9, 0, -, blank).

When editing the Telephone Number information, the characters are selected by using **UP** / **DOWN** to move to the next or previous character in the character set (1,2,3,... 9,0,A,B,C,...Z. -,/,.,blank).

4. PRINTER SETUP

4-1. OPERATION FLOW





[ FLOW VII.3 : PRINTER SETUP MODE IN/OUT FLOW ]

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### 4-2. MODE APPLICATION

In this screen, user can select printer used **with** UP / **DOWN** key.

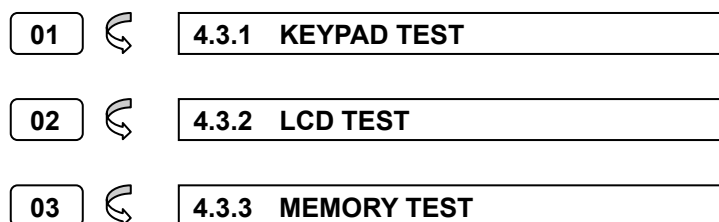
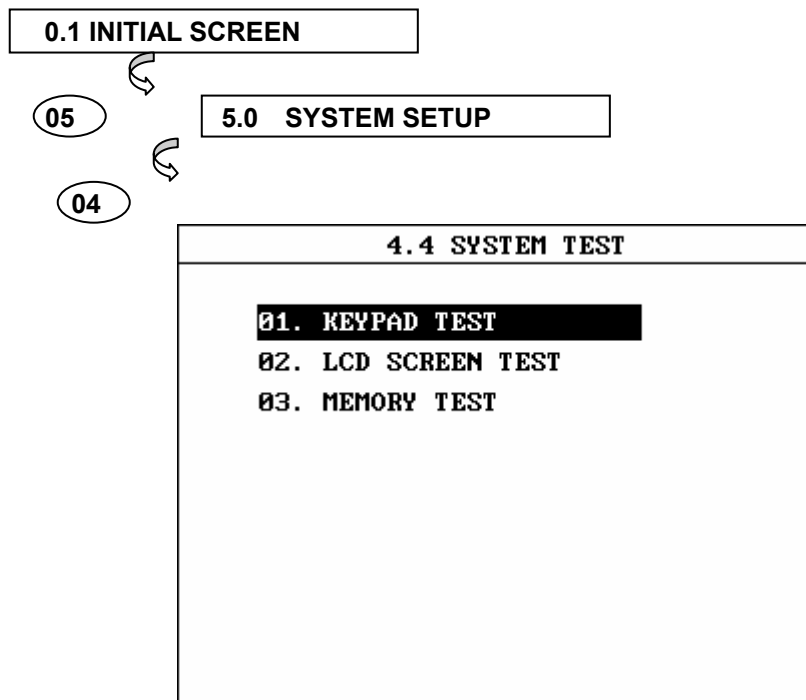
After selecting, with **ESC** key, user can confirm the type of printer to Hi-scan.

## **VII. SYSTEM SETUP**

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## **5. SYSTEM TEST**

### **5-1. OPERATION FLOW**



[ FLOW VII.4 : SYSTEM TEST MODE IN/OUT FLOW ]

You can perform Hi-scan self-test for the maintenance.

Move cursor by **UP** / **DOWN** key or key-in item number  
By **NUMERIC** KE, AND PRESS **ENTER** TO CONFIRM.

**01** key is used to perform keypad test function.

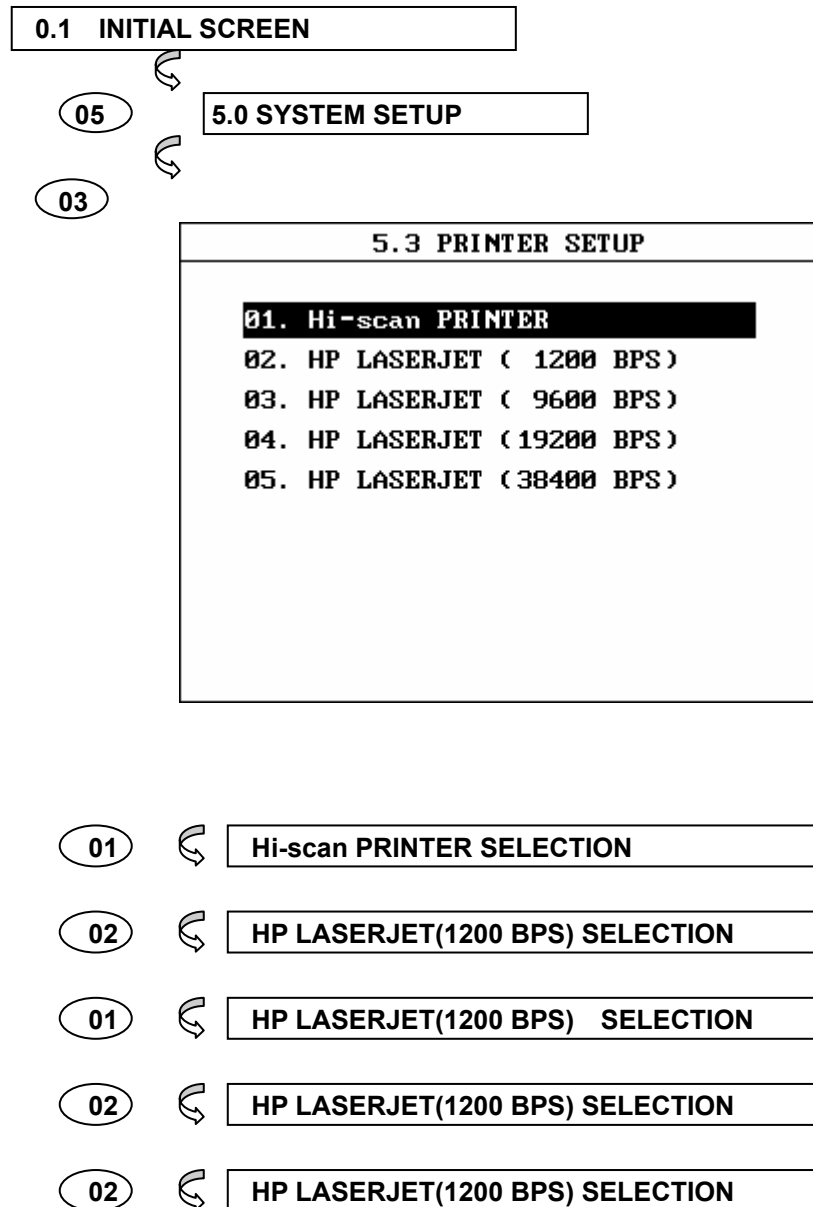
**02** key is used to perform LCD test function.

**03** key is used to perform memory test function.

## VII. SYSTEM SETUP

## 4. PRINTER SETUP

### 4-1. OPERATION FLOW



[ FLOW VII.5 : PRINTER SETUP MODE IN/OUT FLOW ]

## **4-2. MODE APPLICATION**

In this screen, user can select printer used **with** UP /  
**DOWN** key.

After selecting, with **ESC** key, user can confirm the type  
of printer to Hi-scan.

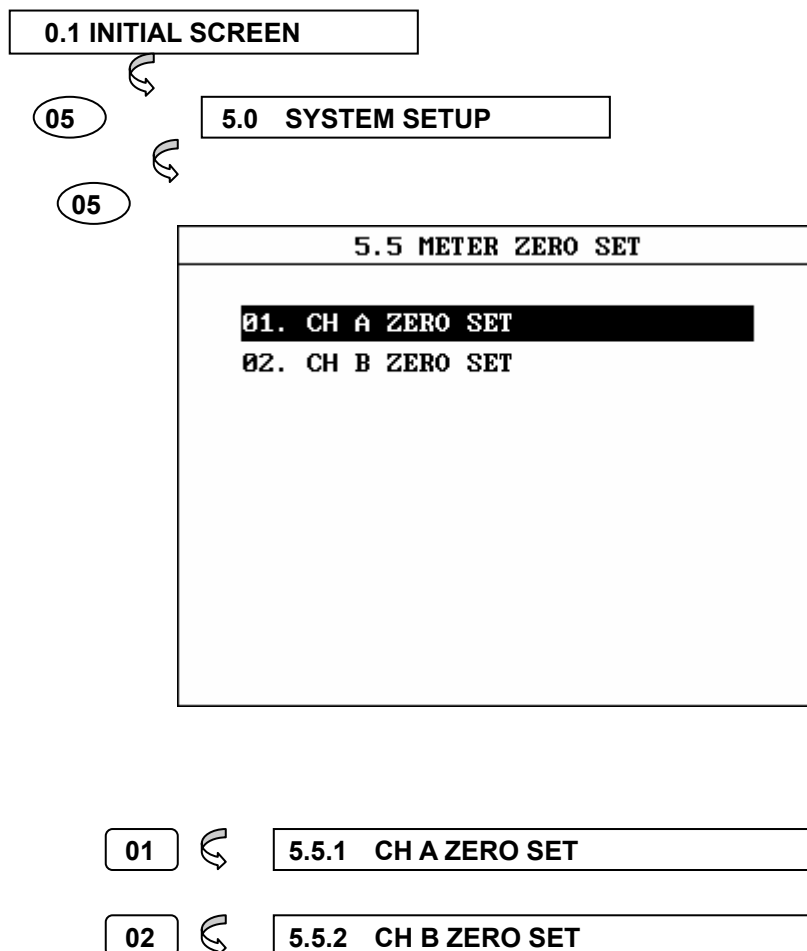


## VII. SYSTEM SETUP

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### 5. METER ZERO SET

#### 5-1. OPERATION FLOW



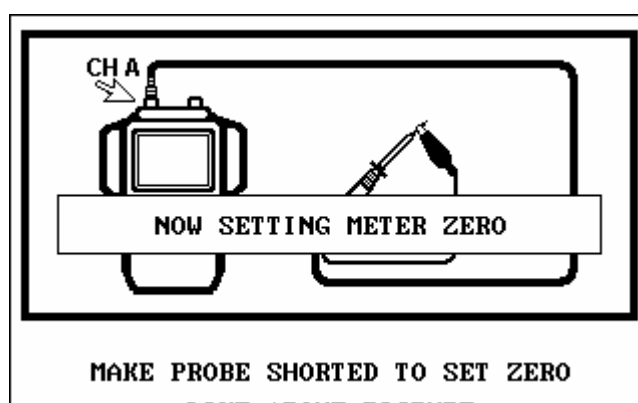
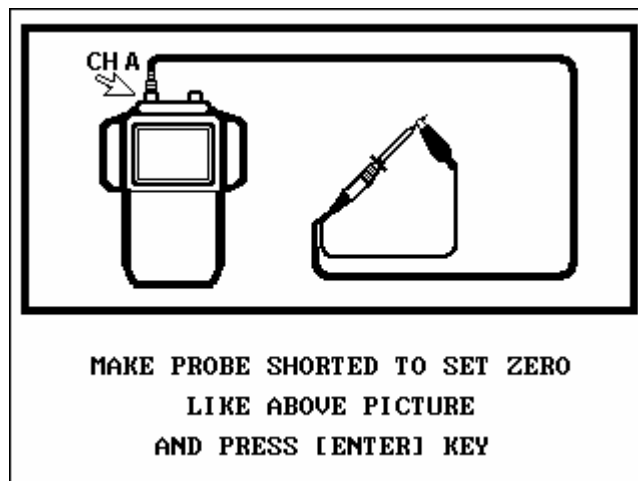
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#### 4-2. MODE APPLICATION

This mode is for controlling zero point for accurate measurement in Multimeter function.

After selecting channel A or channel B, like [figure VII.5] it controls zero point with connection of Oscilloscope probe.



[ Figure VII.5 : ZERO SET ]

## VII. SYSTEM SETUP

# ***Hi-scan Pro***

## **VII. USER MAINTENANCE**

- 1. SOFTWARE CARD INSTALL**
- 2. MEMORY CARD INSTALL**
- 3. RUBBER SHROUD COVERING**
- 4. FUSE REPLACEMENT**
- 5. PRINTER PAPER CHANGE**
- 6. REPLACING BATTERY**
- 7. CHARGING BATTERY**
- 8. FINISHING UP**

## **VII. USER MAINTENANCE**

**VII – 2**

### **1. SOFTWARE CARD INSTALL**

- (1) Turn the Hi-scan Pro Power to OFF.
- (2) Remove the rubber shroud.
- (3) Insert the software card PCMCIA in the upper slot (right part).
- (3) Cover the Hi-Scan Pro with the rubber shroud.

[Figure VII.1:SOFTWARE CARD INSTALL]

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## **2. MEMORY CARD INSTALL**

- (1) Turn the Hi-Scan Pro Power to OFF.**
- (2) Remove the rubber shroud.**
- (3) Turn ON the Hi-Scan Pro.**
- (4) Go to 'SYSTEM CONFIGURATION FUNCTION'**
- (5) Format MEMORY CARD by inserting lower slot**  
**(For details, please refer to VI-2-3)**
- (6) Turn OFF the Hi-scan Pro.**
- (7) Cover the Hi-scan Pro with the rubber shroud.**

**[Figure VII.2: MEMORY CARD INSTALL]**

### **VII. USER MAINTENANCE**

**VII – 4**

## **3. RUBBER SHROUD COVERING**

- (1) Remove all cable connections.
- (2) Press top and bottom part of rubber shroud.
- (3) Insert the Hi-Scan Pro main body into the rubber shroud.

[Figure VII.3: RUBBER SHROUD COVERING]

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## 4. FUSE REPLACEMENT



- (1) Open the tip of the cigar light jack.
- (2) Change the fuse (3A fuse is recommended).
- (3) Close the tip of the cigar light jack.

[Figure VII.4: FUSE REPLACEMENT]

## VII. USER MAINTENANCE

VII – 6

### 5. PRINTER PAPER CHANGE

- (1) Open the cover of the printer.

- (2) Insert bar into paper roll.
- (3) Install paper roll.
- (4) Close the cover of the printer.

[Figure VII.5:PRINTER PAPER CHANGE]

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## **6. REPLACING BATTERY**

- (1) prepare 7 rechargeable batteries  
(1100mAh capacity is recommended).
- (2) Remove the rubber shroud.
- (3) Open battery cover with a screwdriver.
- (4) Insert battery as indicated on the figure.
- (5) Use only rechargeable batteries.
- (6) Close the battery cover.
- (7) Cover with the rubber shroud.

[Figure VII.6:REPLACING BATTERY]

## VII. USER MAINTENANCE

VII – 8

## 7, CHARGING BATTERY

- (1) To use rechargeable battery, you must install rechargeable batteries (see Optional parts)

- (2) All external power supply methods can be used to charge internal batteries.
- (3) AC/DC adapter (sourced in local) is recommended for battery charging.

[Figure VII.7:CHARGING BATTERY]

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## 8. FINISHING UP

- (1) Clean all equipment and cables.  
(Do not use thinner to clean LCD window, UV coating)

- film on the LCD window may be destroyed.)
- (2) Insert equipment in carrying case
  - (3) The Hi-scan Pro main body can be inserted with the DLC cable.

**[Figure VII.8: FINISHING UP]**

## **VII. USER MAINTENANCE**

# ***Hi-scan Pro***

**AP – 1**

## **APPENDIX**

A. IMPORTANT MESSAGE DESCRIPTION

B. TROUBLESHOOTING

C, PIN ASSIGNMENT OF DLC CABLE

**APPENDIX**  
**AP – 2**

App. A IMPORTANT MESSAGE  
**DESCRIPTION**

**ABNORMAL VEHICLE POWER  
CHECK AND PRESS [ENTER]**

This message occurs when the external power supply is not connected or is lower than 9.0. The user must supply normal external power.

***AUTO POWER OFF***

The Hi-scan Pro system will be powered off automatically because there is no SOFTWARE CARD or a Hi-Scan Pro system error has occurred.

**BATTERY VOLTAGE LOW!  
RECHARGE BATTERY**

The voltage of the Hi-Scan Pro rechargeable BATTERY is lower than the normal voltage. The user must recharge the battery with an external power supply or change the battery.

**CAN'T COMMUNICATION  
PLEASE CHECK THE SYSTEM**

The Hi-scan Pro cannot perform the communication because the system status is abnormal. The user must check the system.

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AP – 3

**COMMUNICATION ERROR  
CHECK THE SYSTEM, PRESS [ENTER]**

A communication error occurs when the Hi-Scan Pro displays data which is received via communication. After checking the system, press the **ENTER** key.

**COMMUNICATION STOPPED  
NOW COMMUNICATION TRY**

A communication error occurs in SIMU-SCAN function. This message will disappear when the communication is enabled.



**CONNECT DLC CABLE  
AND PRESS [ENTER]**

This message occurs when a diagnostic test using DLC is performed, but the DLC cable is not connected. The user must correct the CABLE connection, and press the **ENTER** key.

**DIFFERENT SYSTEM  
PLEASE CHECK THE SYSTEM**

This message occurs after opening the communication, when the system is different from the system selected by the user. After checking the system, the user should select the system again.

## **APPENDIX AP – 4**

### ***MEMORY EXPANSION CARD ERROR!***

This message occurs when an error has occurred in the **MEMORY EXPANSION CARD** while testing. The user must change the **MEMORY EXPANSION CARD**.

**NO RECORDED DATA OR  
DIFFERENT SYSTEM DATA**

This message occurs when there is no recorded data or there is a different system data in the **FLIGHT RECORD** mode.

**NO TIPS. FOR MORE  
INFORMATION SEE THE SHOP MANUAL**

This message occurs when the user selects an item that has no **TIPS**.

**NO TROUBLE CODE FOR TIPS**

This message occurs when the user presses the TIPS key, but there is no DTC in the DIAGNOSTIC TROUBLE CODES mode.

**NO TROUBLE CODE TO ERASE**

This message occurs when there is no DTC to erase when the user presses the **ERAS** key in DIAGNOSTIC TROUBLE CODE mode.

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**OUTPUT SIGNAL IS INHIBITED  
CHECK CONNECTION, PRESS [Y/N]**

This message occurs when the Hi-Scan Pro can be damaged because of a mis-connection when further processing is done in ACTUATOR DRIVING mode. To send the output signal to the actuator the user should correct the connection and then press the **YES** key. The user can stop, the signal output with the **NO** key.

**SELECT ITEM WITH [FIX]**

This message occurs when the **GRPH** key is pressed without an item selection in the CURRENT DATA mode, or **RCRD** key is pressed without item selection in the FLIGHT RECORD mode. In these cases, you must select an item with the **FIX** key.

**SIMULATOR SIGNAL IS DISTORTED  
CHECK PROBE, PRESS [ENTER]**

This message occurs when the error between setting and actual implied voltage is greater than 10% in the Voltage Output function in the SIMU-SCAN mode. The user must check the probe connection, and press the ENTER key.

**SOFTWARE CARD ERROR!**

This message occurs when an error has occurred in the SOFTWARE CARD while testing. The user must charge the SOFTWARE CARD.

**APPENDIX  
AP – 6**

**SYSTEM ROM ERROR!**

This message occurs when an error occurs in the ROM(Read Only Memory) of the Hi-Scan Pro. If you are having a problem with the Hi-Scan Pro, please try the procedures in appendix B.

## **App.B TROUBLESHOOTING**

### **1. START-UP TROUBLE**

#### **(1) Symptom**

- 1) No BEEP sound after power ON key is pressed**
- 2) Blank screen is displayed**

#### **(2) Causes Assumption and Recommended Trial**

**Causes Assumption. 1: No power is supplied to the Hi-Scan Pro**

Trial 1-1 : If power supplied by DLC cable, check that the  
the DLC cable is connected. If there is no problem if  
DLC cable, change the power supply method.

Trial 1-2 : If power supplied by Cigar lighter  
power cable,  
check fuse in the cigar lighter power  
cable. If there  
is no problem in the cigar lighter  
power cable,  
change the power supply method.

Trial 1-3 : If power supplied by Battery, check that the  
**Battery charging voltage is over 12.0 volt. If there  
is no problem in the battery, change the power  
supply method.**

Trial 1-4 : If power supplied by Local sourced AC/DC  
adapter, check that the **AC/DC adapter voltage is  
over 12.0 volt. If there is no problem in the AC/DC  
adapter voltage, change the power supply method.**

## **APPENDIX**

### **AP – 8**

#### **2, POWER SUPPLY TRIP MODE**

**To protect the Hi-Scan Pro and power supply from harmful  
electrical shock-such as a surge in the power supply line-,  
there is a trip function in the Hi-Scan Pro power supply.**

When the power supply has been tripped, the power supply status is still ON but the power supply has been halted. So this status can be mis-understood to be OFF status by the user, but the power supply is still alive. To release the trip mode, you must reset the power supply by pressing the ON/OFF key for more than 2 seconds (power OFF) and pressing the ON/OFF key for about 0.5 second (power ON).

A description of this trip function's symptom and recommended trial is described below.

**(1) Symptom**

- 1) LCD suddenly OFF, and no key operation can be performed in the power ON mode.

**(2) Causes Assumption and Recommended Trial**

Cause Assum. 1: The Hi-Scan Pro power supply has entered the trip mode for surge protection.

Trial 1-1 :

- a. Press the ON/OFF key for more than 2 seconds to turn the power supply OFF.
- b. Press the ON/OFF key for more than 0.5 second to turn the power supply ON.

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**AP – 9**

- c. In normal mode, the power supply can be restarted by the reset trip.
- d. If a severe or continuous surge is sent to the Hi-Scan Pro power supply some time can be needed for physical recovery of the power supply. This recovery may take a

**full day.**

### **3. BLANK SCREEN DISPLAYED**

#### **(1) Symptom**

- 1) BEEP sound after power ON key is pressed and a blank screen is displayed.**

#### **(2) Causes Assumption and Recommended Trial**

Causes Assum. 1: LCD Contrast misadjusted

**Trial 2-1 : Restart the program by pressing the ON/OFF key.**

Causes Assum. 3 : Program card or Memory expansion card misinstalled.

**Trial 3-1:Check Card installation status.**

## **APPENDIX**