Module 28
Scan Tool — Advanced

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- Scan Tool—Advanced
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- Misfire Monitor
- Oxygen Sensor Monitor
- Oxygen Sensor Heater Monitor
- “P” Codes

Miscellaneous Training Material

- Glossary of Terms

28 OBD-II Scan Tool – Advanced

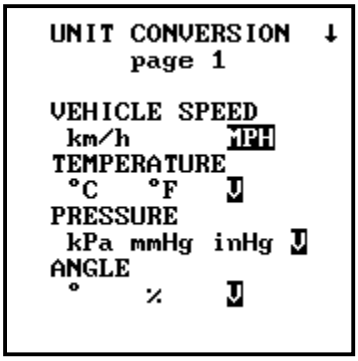
28.1 General Overview

This training module covers some of the more advances uses of OBD-II scan tools. While the main focus of this module is on Vetronix's Mastertech, many other scan tools may have these features. I would encourage you to learn all the capabilities of the scan tool you use. While the scan tool has some limitations, it can be a powerful diagnostic tool.

28.2 Data Display Options

In addition to retrieving diagnostic trouble codes (DTC), a scan tool is used to retrieve live and historical processor data. Remember that all information reported by a scan tool is streaming from the engine control module's (ECM) processor. Reading input values at the processor checks the sensor and all the circuitry, however an output values may not reflect the condition at the output device.

Screen Capture 28-1



On the Mastertech tester you can choose which unit of measure you want the data displayed in. It most cases you can choose between the input signal's native format, or several other calculated values. It is best to display the unit of measure that you would normally use if checking the component with a digital volt-ohm meter (DVOM) or digital storage oscilloscope (DSO).

For instance manifold absolute pressure (MAP) can be displayed in kPA, mmHg, inHg, or volts (Screen Capture 28-1). The MAP sensor's input to the ECM is voltage. In the case of the MAP input, I prefer to display it as a voltage since I routinely check MAP sensors with a digital voltage ohm meter (DVOM) and have this value memorized.

Screen Capture 28-2

The Mastertech can also display data in two different sizes. The tester can display either 12 lines of information or 16 lines of information. You set the display test size in the utility section.

28.3 Data View Options

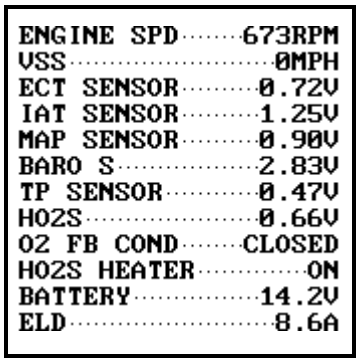
As shown on the Data List Menu, shown in Screen Capture 28-2, the Mastertech unit will allow you to view data many different ways. The All Data List is the most common and allows you to see all the available parameters. The Custom List is similar to

the All Data List, but allows you to specify which parameters to view. The LED List, Bar Graph, and Line Graph modes display the data in a more graphical way.

Once viewing data, you may quick jump to any other view by just entering the view number. For instance, if you were viewing data in the All Data List view, pressing "5" would take you straight to the 2 Line Graphing View.

Following is a summary of all the data views:

Screen Capture 28-3

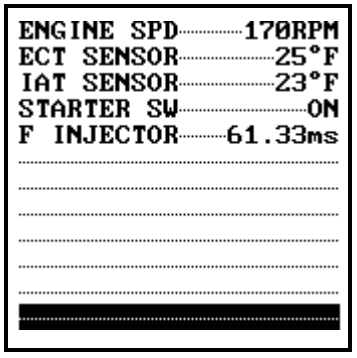


All Data List

The All Data List, shown in Screen Capture 28-3 is the most used of all the data lists. It gives you all the available parameters. On some models the list can be rather long (30+ parameters) and take multiple screens to display.

To get expanded information on any listed parameter, highlight the parameter and press "*" and "Help" at the same time.

Screen Capture 28-4



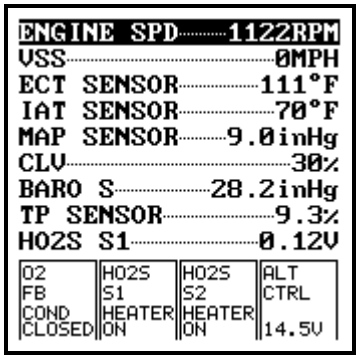
Custom List

The Custom List allows the user to pick which parameters to display. In this screen capture only 5 parameters have been chosen.

To change a parameter use the "Yes and "No" buttons.

This view is convenient when you want to see a few parameters on a single screen.

Screen Capture 28-5

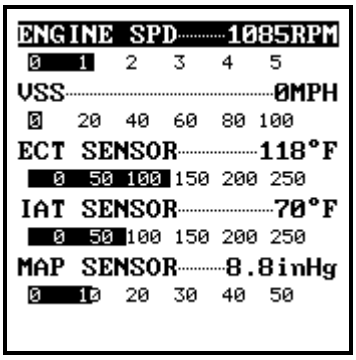


LED List

The LED List, shown in Screen Capture 28-5, allows the user to assign a parameter to each of four boxes across the bottom of the screen. Just below each box is a red and green LED (not shown). The LED will be green or red based on the value in the box.

The LED feature can only be used with parameters that have a two state status, such as on/off, closed/open, etc.

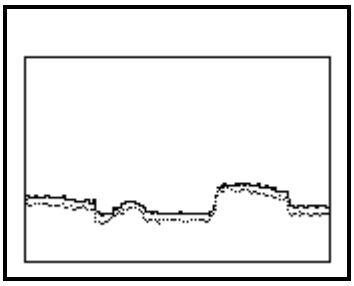
Screen Capture 28-6



Bar Graph

The Bar Graph, shown in Screen Capture 28-6, allows the user to pick five (6 in compressed mode) parameters to display in a horizontal bar graph.

Screen Capture 28-7



Line Graph

The Line Graph, shown in Screen Capture 28-7, will display up to two parameters in a scrolling line graph. One is represented by a solid line, and one represented by a dotted line.

While this screen has the look of a graphical multi- meter (GMM) remember that the tester input in this mode is serial data and the refresh rates will be slow. Also notice the absence of any values on the graph.

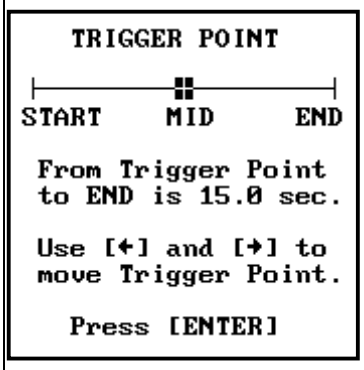
28.4 Snapshot Mode

Screen Capture 28-8

To aide a tech in capturing data during a malfunction, the Mastertech has a "snapshot" mode. The tester can record up to 30 seconds of data for playback at a later time. When recording in the snapshot mode, date is recorded every .2 second.

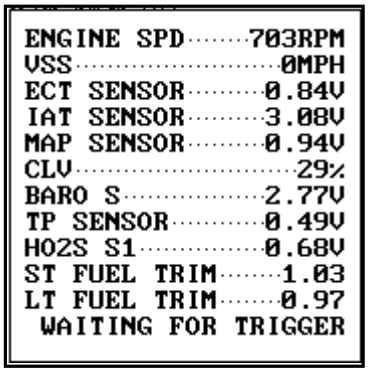
You set up a snapshot session from the Snapshot Menu, shown in Screen Capture 28-8. The tester can be set up to record for 30 seconds whenever a DTC is set (menu choice 1) or whenever a button on the tester is pressed (menu choice 2).

Screen Capture 28-9



The menu shown in Screen Capture 28-9 is where you can set up how much of the 30 seconds is before or after the trigger point.

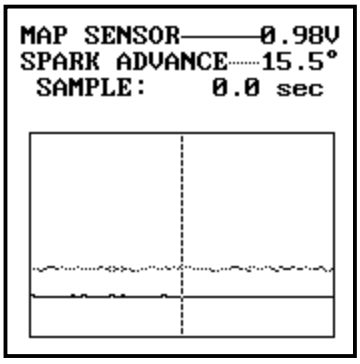
Figure 28-10



Here is a Mastertech set up to do a snapshot. Notice the "WAITING FOR TRIGGER" at the bottom of the screen. You can start the recording by pressing "Enter" or program the tester to record on the storing of a DTC.

Assuming you had the trigger point set at mid point, when you start the snapshot the using would record 15 seconds of data and add it to the 15 seconds that just preceded pressing the button. The date is recorded every .2 second.

Screen Capture 28-11

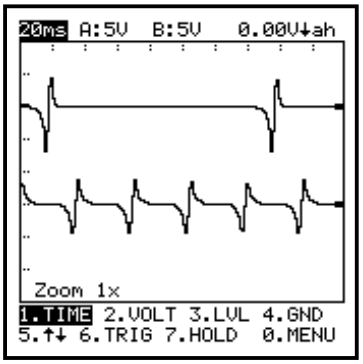


Once a snapshot has been recorded the recorded data can be viewed in any of the 5 data list views.

Screen Capture 28-11 shows a Mastertech that is in playback mode. The dashed line lets you know where in the 30 second time line you are reading the values from.

28.5 Digital Storage Oscilloscope Functions

Screen Capture 28-11



The Mastertech unit does have DSO capabilities. When using the tester as a DSO you use a set of leads that plug into a RS232 port on the bottom of the tester.

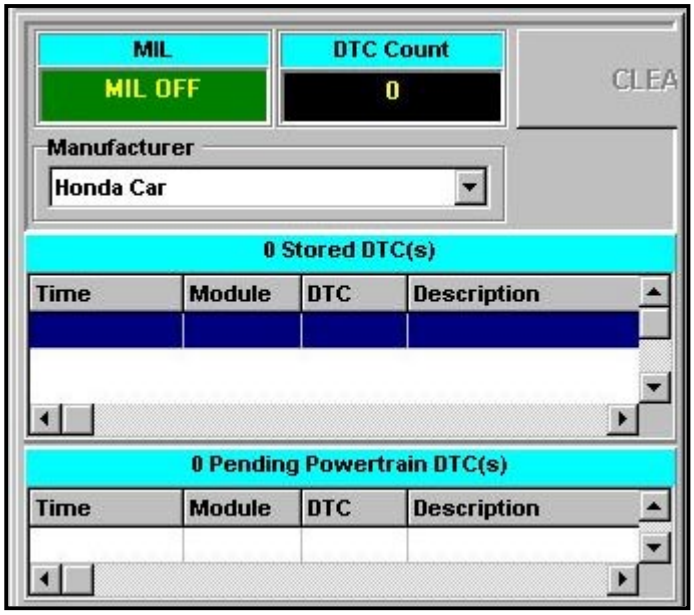
The unit is a two channel DSO. The capabilities of the Mastertech's DSO mode is not as robust as a dedicated DSO tester.

28.6 PC Based Scan Tool

Ease Simulation offers an OBD-II compliant scan tool that is PC based. An OBD-II cable plugs into a Com port and the installed software is used to turn your PC into an OBD-II scanner.

At present Ease does not support Honda past generic OBD-II levels. The advantages of a PC based scan tool are:

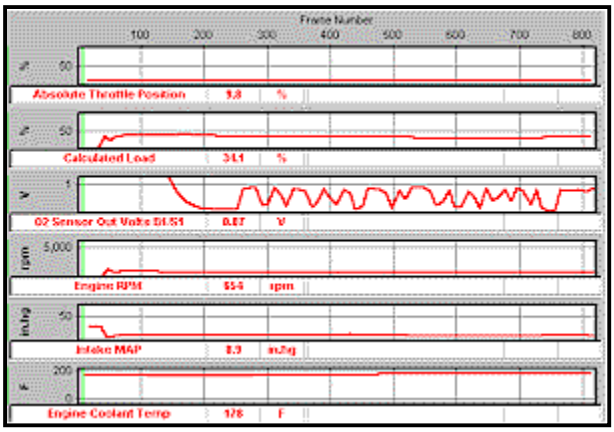
- Large Screen
- Graphing of up to 6 parameters
- Recording of parameters
- Up to 10 hours of remote recording of parameters with the DataLogger unit.



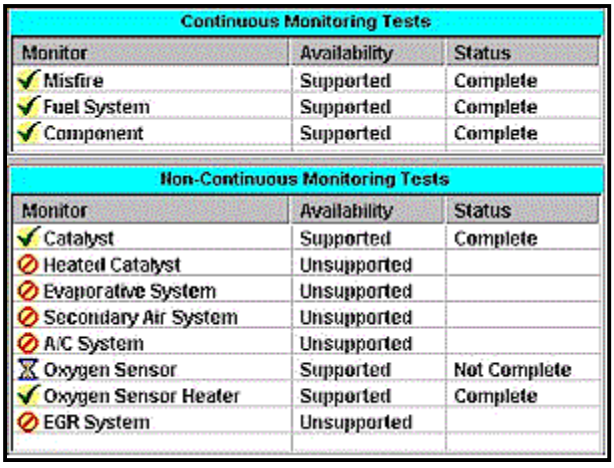
Following are some screen captures from the Ease software.

This screen is used to check for DTCs. It will show all stored and pending DTC

This is a screen that will allow you to look at the parameters in a digital format.



This screen will graph up to 6 parameters simultaneously.



Continuous Monitoring Tests

Monitor	Availability	Status
Misfire	Supported	Complete
Fuel System	Supported	Complete
Component	Supported	Complete

Non-Continuous Monitoring Tests

Monitor	Availability	Status
Catalyst	Supported	Complete
Heated Catalyst	Unsupported	
Evaporative System	Unsupported	
Secondary Air System	Unsupported	
A/C System	Unsupported	
Oxygen Sensor	Supported	Not Complete
Oxygen Sensor Heater	Supported	Complete
EGR System	Unsupported	

This is the screen used to check on the monitor status.