

SUZUKI 95-96 BCM CARTRIDGE

Operator's Manual

**For use with
Cartridge Part Number
02002148**

tech 1[®]

SOME THINGS YOU SHOULD KNOW



CAUTION:

EXHAUST GAS

When performing any checks with the engine running in an enclosed space such as a garage, be sure there is proper ventilation. Never inhale exhaust gases; they contain carbon monoxide, a colorless, odorless extremely dangerous gas which can cause unconsciousness or death.



CAUTION:

To help avoid personal injury always set the parking brake securely and block the drive wheels before performing any checks or repairs on the vehicle.

DISCLAIMER

The **TECH 1** is designed for use by trained service personnel only. It has been developed for the sole purpose of diagnosing and repairing automotive electronic systems. Every attempt has been made to provide complete and accurate technical information based on factory service information available at the time of publication. However, the right is reserved to make changes at any time without notice.

FCC COMPLIANCE

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. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, and may cause harmful interference to radio communications. Operation of this equipment in a residential 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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1.0 SUZUKI 95-96 BCM CARTRIDGE DESCRIPTION

The SUZUKI 95-96 BCM Cartridge is a "Master Cartridge", used with the **TECH 1** to diagnose and troubleshoot the Automatic Transmission (A/T), Antilock Brake System (ABS), and Airbag systems used on the following vehicles:

MODEL	SYSTEM	ECU TYPE	MFG. NO.
SY SERIES	4 SPEED AT	1	AISIN A.W.
SY SERIES SV 620	ABS (4 CHANNEL) ABS (3 CHANNEL)	2	SUMITOMO-DENKO
SY SERIES	AIRBAG	3	SIEMENS AG.
SE SERIES	4 SPEED AT	4	AISIN A.W.

HOW THE SUZUKI 95-96 BCM CARTRIDGE WORKS WITH THE TECH 1

The **TECH 1** lets you monitor data and control ECU operation by communicating with the ECU via the serial Data Link Connector (DLC) present in the vehicle. The **TECH 1** consists of a microcomputer, which communicates with the ECU and controls its operation, a keypad to receive directions from you, and a display to provide the data you need to diagnose vehicle electronic problems. The **TECH 1** communicates with the ECU by applying an electrical signal to the serial data link connector Diagnostic Enable pin, then reads the ECU data signal from one of the serial data link connector pins, and translates it into an intelligible data display. The SUZUKI 95-96 BCM Cartridge contains the microcomputer program which performs all of the functions described in this manual.

HOW YOU USE THE SUZUKI 95-96 BCM CARTRIDGE WITH THE TECH 1

The **TECH 1** and this cartridge are designed to be extremely easy to use. However, it is recommended that you read through the manual to get a feel for the operation of the **TECH 1**. The general steps to follow when diagnosing vehicle electronic problems with the **TECH 1** are:

- 1 -Connect the **TECH 1** to the vehicle
- 2 -Select the language, the model, the system, and the test mode to be run
- 3 -The **TECH 1** runs the test mode and you study the displayed data

Test modes are selected by pressing the appropriate key displayed on the test mode selection "menu". You then select the data parameters you wish to monitor with the **YES** and **NO** keys. It doesn't take long to learn and there isn't a lot to remember. However, DETAILED OPERATING INSTRUCTIONS ARE GIVEN IN THE FOLLOWING SECTIONS OF THIS MANUAL.

GENERAL TECH 1 KEY FUNCTIONS

YES & NO	Answer questions asked on TECH 1 display and select data parameters to monitor.
EXIT	Return to previous step.
↑ & ↓	Scroll through test mode selection menus and control display of captured data.
0 - 9	Designate trouble codes.
F0 - F9	Select and control test mode.
F8	Print Data List parameters.
ENTER	Enter designated trouble code.

2.0 GETTING STARTED

Before operating the SUZUKI 95-96 BCM Cartridge with the **TECH 1**, the following steps must be performed:

1. The SUZUKI 95-96 BCM Cartridge is a master program cartridge so insert it into the bottom slot of the **TECH 1**. Verify that no other master cartridge (e.g. SUZUKI 1991-94 ECM Cartridge) is installed in the top slot. If you are using a **TECH 1** and intend to connect the **TECH 1** to a peripheral device such as a printer or terminal, install the RS232C Cartridge in the top cartridge slot. The RS232C Cartridge is not required if you are using a **TECH 1** Series A.
2. Make sure the vehicle ignition is OFF.
3. Locate the vehicle's serial data link connector. It is usually under the dash on the driver's side. Refer to the vehicle service manual if you are in doubt.
4. Plug the **TECH 1** cable into the vehicle serial data link connector.
5. Turn the ignition switch to ON.
6. Verify that the **TECH 1** displays the screen below:



LANGUAGE SELECTION MENU

7. If the display is correct, press the function key to the left of the language you wish to select. After the language is selected, proceed to Section 4.0 to select the model year and system.
8. If the display is not correct, refer to Appendix A, If You're Having a Problem.

3.0 OPERATING PRECAUTIONS

CONNECTING AND DISCONNECTING THE TECH 1 WHILE THE IGNITION KEY IS ON

Due to the possibility of voltage spikes that could damage the ECU or **TECH 1**, you should not connect or disconnect the **TECH 1** while the ignition key is ON or while the engine is running.

REMOVING THE CARTRIDGE WHILE POWER IS APPLIED

You should not remove or install master or auxiliary cartridges while the ignition key is ON, or while the engine is running. If you wish to change or add a cartridge:

1. Turn the ignition off.
2. Disconnect the power plug.
3. Install the cartridge.
4. Reconnect the power plug.

If the **TECH 1** does not appear to be functioning properly, perform the following steps to reset the **TECH 1**:

1. Turn the ignition off.
2. Disconnect the power plug.
3. Remove all cartridges from the tester.
4. Connect the power plug to the tester.
5. When "MASTER CARTRIDGE IS MISSING" is displayed, disconnect the power plug.
6. Install the cartridge.
7. Reconnect the power plug.

REMOVING OR CHANGING MASTER CARTRIDGES CONTAINING SNAPSHOT DATA

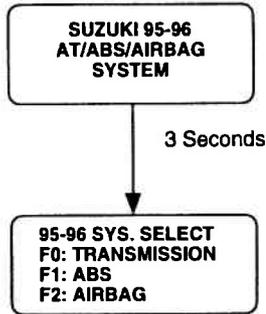
SNAPSHOT data that has been captured by a master cartridge can be printed on a **TECH 1** (or compatible) printer, transferred to a computer for further analysis, or displayed on a terminal. The SNAPSHOT data will be retained within the **TECH 1** memory for at least one-half hour, even if the **TECH 1** is disconnected from the vehicle. However, IF YOU POWER UP THE **TECH 1** WITHOUT A MASTER CARTRIDGE OR WITH A DIFFERENT MASTER CARTRIDGE, THE SNAPSHOT DATA WILL BE LOST.

4.0 SELECTING THE VEHICLE

When you have connected the **TECH 1** to the vehicle, turn the key to the ON position and then select a language. The next step is to select a system to test.

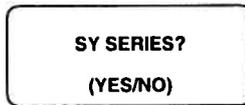
SELECTING THE SYSTEM

After the Power-Up screen is displayed, the **TECH 1** displays the systems available for testing. Press the key listed to the left of the system you wish to test.



TRANSMISSION

When F0: Transmission is selected, the tester asks if you are testing an SY SERIES vehicle. Press **YES** if the vehicle is an SY SERIES, or press **NO** if the vehicle is not an SY SERIES vehicle. The tester will advance to the Select Mode menu. Detailed operating instructions for the various test modes are included in Section 5.0 of this manual.



ABS

If F1: ABS is selected, the tester proceeds to the Select Mode menu. Detailed operating instructions for the various test modes are included in Section 5.0 of this manual.

AIRBAG

When F2: Airbag is selected, the following screen is displayed.

ALWAYS DO AIRBAG
DIAG SYS. CHECK
IN S/M (AIRBAG
SYS. SECTION) ↓

Perform the Airbag Diagnostic System Check as described in the Suzuki Service Manual, then press **↓** to proceed to the Select Mode menu.

ACTIVE TECH 1 KEYS

- F0 - F2** Select system.
- YES - NO** Select SY SERIES vehicle or other vehicle.
- ↓** Proceed to the Select Mode menu.

5.0 SELECTING AND OPERATING THE TEST MODES

The following section contains a brief description of each test mode available in the SUZUKI 95-96 BCM Cartridge. A more detailed description is included later in this section, along with the operating procedure for each test mode.

MODE F0: DATA LIST

Monitor data parameters from the ECU.

MODE F1: PRINT DATA

Send one data stream of information to a serial printer, terminal or smart device.

MODE F2: TROUBLE CODES

Display stored trouble codes on all models and clear stored trouble codes on certain models.

MODE F3: SNAPSHOT

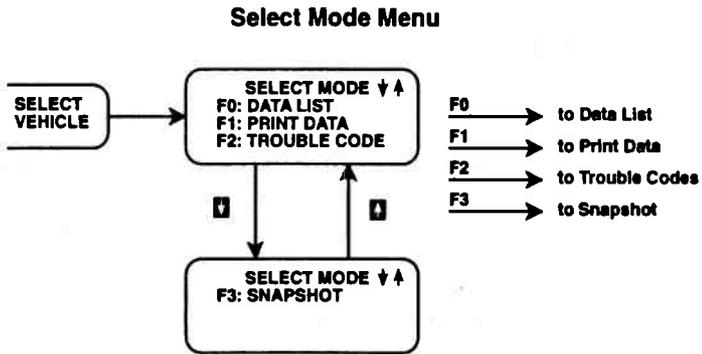
Capture and store ECU data parameters. Data is captured before and after a "trigger" point. Triggers can be on any trouble code, a particular trouble code, or manual **TECH 1** key press. Captured data can then be displayed as well as trouble codes.

NOTE: The Snapshot mode is not available when testing the Airbag system.

ECU NO.	SYSTEM	DATA LIST	PRINT DATA	TROUBLE CODE	SNAPSHOT
1	A/T	•	•	•	•
2	ABS	•	•	•	•
3	AIRBAG	•	•	•	•
4	A/T	•	•	•	•

SELECTING TEST MODES

The **TECH 1** makes selecting the test mode easy by displaying a menu of tests (a test mode "menu"). The menu also displays which key is used to select each test mode. An example test mode menu is shown below.



To select a test mode, simply press the **TECH 1** key listed to the left of the test mode on the menu. Since there are up to four test modes, the keys **F0** - **F3** are used.

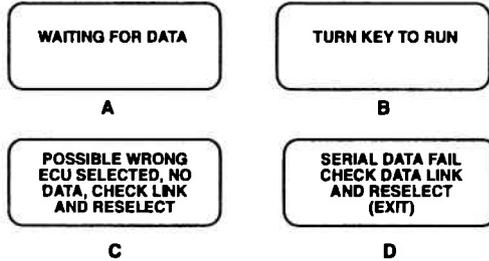
Up to three test modes are shown as soon as the ECU is selected. If other test modes are available, the display automatically scrolls to the next display after three seconds. The display automatically scrolls between the menu screens. To stop the automatic scrolling, press either the **↑** or **↓** key. The menu may then be manually changed by pressing either the **↑** or **↓** key. All multiple menus of more than three items scroll in this way.

REGARDLESS OF WHICH TEST MODES ARE DISPLAYED, ANY TEST MODE CAN BE SELECTED AT ANY TIME FROM THE MENU.

ACTIVE TECH 1 KEYS	
F0 - F3	Select Test mode.
↑ & ↓	Stop automatic menu scrolling, then used to manually control the menu display.
EXIT	Return to System Selection menu.

TECH 1-ECU COMMUNICATIONS STATUS DISPLAYS

Most **TECH 1** test modes display data. Therefore, these test modes require the ECU to send data to the **TECH 1**. When you select a test mode, you may see one or more of the following **TECH 1-ECU** communications status displays.



Display A means that the **TECH 1** has not yet received a complete data message from the ECU. This display is sometimes seen right after selecting a test mode.

Display B is a reminder that the ignition key needs to be in the RUN position for the **TECH 1** to communicate with the vehicle.

Display C occurs when the **TECH 1** has not received any data from the selected ECU. In this case, you should verify that the ignition is ON and check the serial data link connections.

Display D occurs when communication with a vehicle has failed after communication has already been established.

NOTE: If display C or D appears when the ABS control module is selected, the probable cause is a stop in the communication function on the ABS control module. To correct the problem, perform either of the following two steps:

1. Use a service wire to short between the diagnostic switch terminal of the diagnostic 2 monitor coupler for the ABS and the ground terminal of the diagnostic 1 monitor coupler. Refer to the applicable service manual for the location of each terminal position.
2. Spin one of the four wheels.

If the problem persists, refer to Item 5 in Appendix A.

ACTIVE TECH 1 KEYS

EXIT

Return to vehicle select step.

MODE F0**DATA LIST**

The purpose of the DATA LIST mode is to passively monitor data which is being transmitted from the ECU during normal operation of the vehicle. This mode does not affect vehicle operation and you can use it to read data to see if it is correct, or at least reasonable. The current value of the parameter is displayed with the parameter units. This means you don't have to hunt through manuals to find out what is being displayed.

The data parameters are displayed in pre-programmed pairs. You can also create your own pairs through the process explained on the following pages.

OPERATING PROCEDURE:

1. Press **F0** to select DATA LIST mode from the Select Mode menu.

NOTE: When you are testing the ABS, if a current trouble code is present when Data List is selected, or if a current trouble code is detected while the Data List mode is active, the tester displays the following message.

CURRENT TROUBLE
CODE SET, DATA
NO LONGER VALID
(EXIT)

For the ABS, current trouble codes cause the ABS control module to send invalid data to the tester. Therefore, data displayed in Data List, Print Data, and Snapshot modes is not valid and should not be used for diagnosing the vehicle. To clear the trouble codes, use Mode F2: TROUBLE CODES to display the current Trouble Codes. Repair the cause of the trouble code(s), then clear the codes using Mode F2. When all current trouble codes have been cleared, select F0: DATA LIST again to display vehicle data.

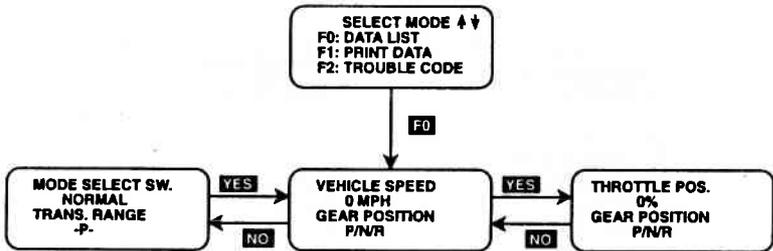
2. Select the data parameters to be displayed by scrolling through the parameters with the **YES** and **NO** keys.
3. You may return to the select mode menu at any time by pressing **EXIT**

VIEWING ECU DATA PARAMETERS

In order to maximize the information that can be seen at one time, the **TECH 1** displays data parameters in preassigned pairs. The first data pair displayed after you press **F0** is shown in the figure below. Also shown is how to scroll through the Data List with the **YES** and **NO** keys and how to create your own data pairs with the **F0** and **F1** keys.

To see other preassigned pairs, press either the **YES** or **NO** key. The **YES** key will cause the **TECH 1** to scroll forward through the list of preassigned pairs, while the **NO** key will cause scrolling backwards.

Section 8.0 contains descriptions of all AT/ABS/AIRBAG data parameters.



CREATE YOUR OWN DATA PAIRS

You can create data parameter pairs which are different from the preassigned pairs. Any two parameters can be displayed as a pair by simply scrolling either the bottom or top display parameter, while the other display parameter is fixed. To "fix" the top parameter press **F0**, an asterisk will appear by the fixed parameter. Press **F1** to "fix" the lower parameter. The **TECH 1** will not allow both the top and bottom parameters to be fixed at the same time.

As an example, let's say you wish to create a pair with VEHICLE SPEED and THROTTLE POS. To do so, scroll through the preassigned pairs with the **YES** and **NO** key until you find a pair with VEHICLE SPEED. Fix the VEHICLE SPEED by pressing the **F0** key if VEHICLE SPEED is the top parameter, or the **F1** key if it is the bottom. Then scroll the other half of the display with either the **YES** or **NO** key until THROTTLE POS. is displayed.

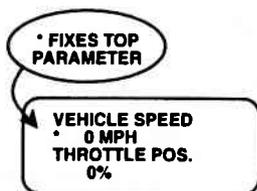


FIGURE A

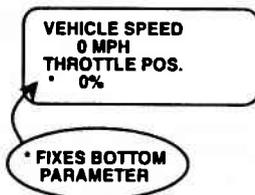
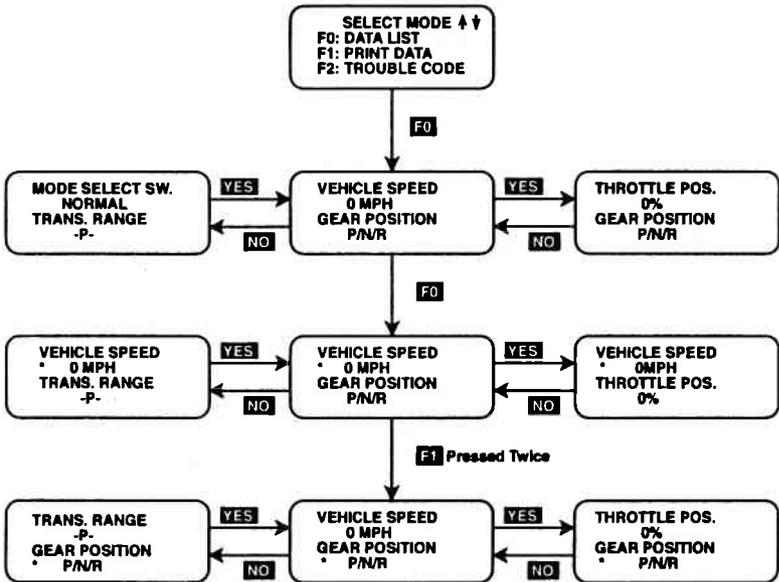


FIGURE B

PRINTING DATA

The currently displayed sample may be printed if the **TECH 1** is equipped with an RS232C I/F Cartridge connected to a compatible printer. The RS232C I/F Cartridge is not required if you are using a **TECH 1** Series A tester. To print the data, press **F8**. The **TECH 1** keyboard is disabled while data is being sent to the printer.

EXAMPLE OF SELECTING AND DISPLAYING DATA PAIRS



ACTIVE TECH 1 KEYS FOR DATA LIST

YES & NO Scroll through displayed data parameters.

F0 Mark top displayed parameter as “fixed” for creating your own data pairs.

F1 Mark bottom displayed parameter as “fixed” for creating your own data pairs.

EXIT Return to the Select Mode menu.

MODE F1**PRINT DATA**

When the RS232C I/F Cartridge is installed in the **TECH 1**, or if you are using a **TECH 1** Series A tester, the Print Data mode allows you to print the VIN, system type and Data List to a serial printer or terminal. This is the data list sent by the engine computer to the **TECH 1**. The data list parameters can be printed without printing the VIN or type by pressing the **F8** key in the Data List or Snapshot Replay mode.

OPERATING PROCEDURE:

1. Press **F1** to select Print Data from the Select Mode menu.

NOTE: When you are testing the ABS, if a current trouble code is present when Print Data is selected, or if a current trouble code is detected while the Print Data mode is active, the tester displays the following message.

CURRENT TROUBLE
CODE SET, DATA
NO LONGER VALID
(EXIT)

For the ABS, current trouble codes cause the ABS control module to send invalid data to the tester. Therefore, data displayed in Data List, Print Data, and Snapshot modes is not valid and should not be used for diagnosing the vehicle. To clear the trouble codes, use Mode F2: TROUBLE CODES to display the current Trouble Codes. Repair the cause of the trouble code(s), then clear the codes using Mode F2. When all current trouble codes have been cleared, select F1: PRINT DATA again to print the vehicle data.

2. The VIN entry screen is the first screen displayed in this mode. Use the 0 - 9 keys on the tester keypad to enter the last six digits of the vehicle's VIN, then press **ENTER**. This information is printed out as part of the header information that accompanies each Data List print out.
3. The next screen requires the **ENTER** key to be pressed to start printing the data. This screen allows the cable to be connected between the RS232C Cartridge and the receiving device.

PRINT DATA	MODE F1
-------------------	----------------

4. When the **ENTER** key is pressed "WAITING TO PRINT DATA" is displayed until printing begins. If this screen is displayed for more than a few seconds, something is wrong with the set up procedure. Check that all connections are secure, and that the printer is turned on and in the proper receive mode.

5. As printing begins, the **TECH 1** displays the % COMPLETE of the print procedure. After the printing is 100% complete, the VIN screen is immediately displayed with the previously selected VIN number. Pressing the **ENTER** key twice from this screen will cause another data stream to be buffered for printing as soon as the current data stream is output from the **TECH 1**.

6. Pressing the **EXIT** key at any point will cause the select mode menu to be displayed. If the **EXIT** key is pressed before printing is completed, only the data that has already been sent to the RS232C Cartridge will be printed. **SOME DATA WILL BE LOST.**

**PRINT DATA
ENTER LAST 6 VIN
DIGITS 000000
THEN PRESS ENTER**

**PRINT DATA VIN
ENTRY SCREEN**

**PRESS ENTER TO
PRINT DATA**

**SET UP RS232C
CARTRIDGE**

**RS232C NOT
CONNECTED**

**RS232C INTERFACE
CARTRIDGE
NOT CONNECTED**

**WAITING TO
PRINT DATA**

PRINT INITIALIZATION

**99% COMPLETE
PRINT DATA**

**PRINT IN PROGRESS
SCREEN**

ACTIVE TECH 1 KEYS TO PRINT DATA

ENTER	Move to the next section of the Print Data function.
1 - 9	VIN entry keys.
EXIT	Terminate the Print Data mode and return to the select mode menu.

MODE F2

TROUBLE CODES

Trouble codes or diagnostic codes are set by the ECU when an abnormal condition is detected. They are a key to diagnosing many of the problems which can occur in the vehicle. The F2 mode allows you quick access to trouble codes for initial vehicle checks and to check that a repair procedure has been successful.

Displays for the Trouble Codes mode are shown on the following page.

NOTE: Trouble codes can also be displayed in Snapshot replay mode.

OPERATING PROCEDURE:

1. Press **F2** to select the TROUBLE CODES mode from the Select Mode menu.

The **TECH 1** informs you if no trouble codes are present

AIRBAG SYSTEM

If you are testing the Airbag system, the following menu is displayed.

TROUBLE CODES
F0: DISPLAY CODES
F1: LAMP CLEAR
F2: LOCK CLEAR

Press **F0** to display the Airbag system codes.

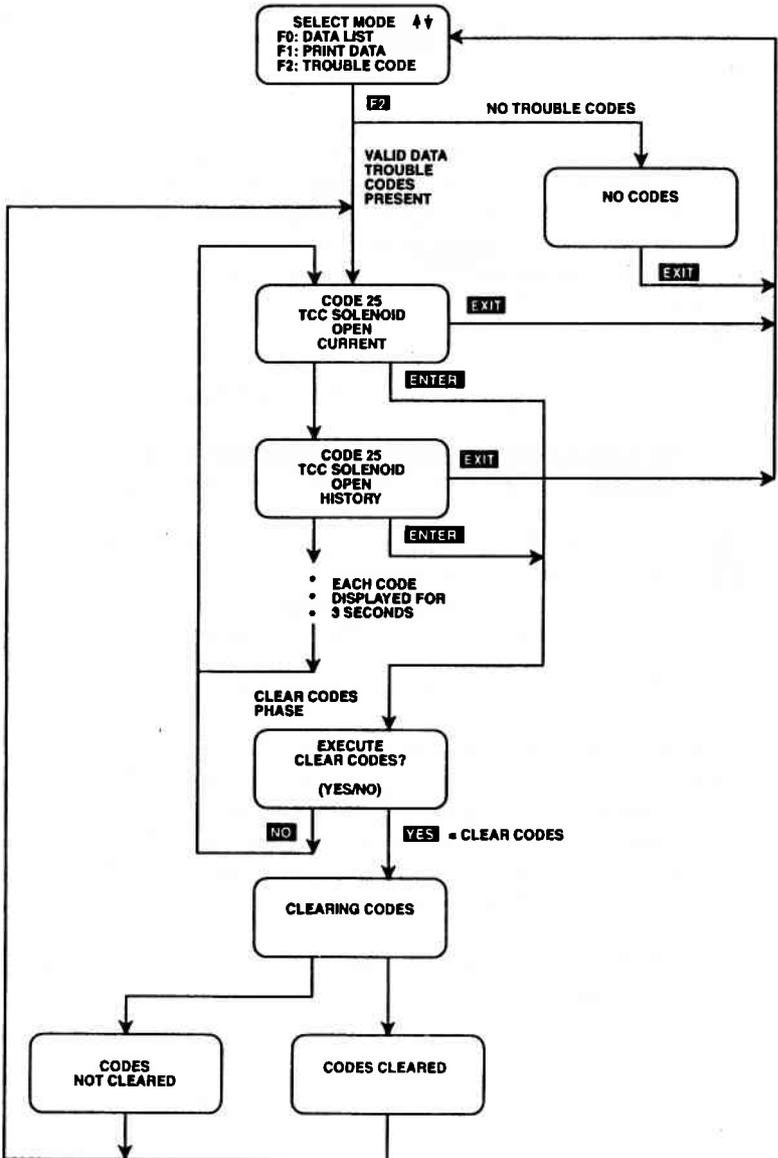
Press **F1** to clear the Airbag Warning Lamp.

Press **F2** to clear the Near-Deploy Lock.

2. When **F0** is selected, if trouble codes are present, the **TECH 1** automatically displays each trouble code for three seconds.
3. The trouble codes are continuously displayed, wrapping around to the first code automatically after the last trouble code has been displayed. First a listing of all Current trouble codes is displayed, followed by History trouble codes. Current or History is displayed indicating the type of code.

TROUBLE CODES	MODE F2
----------------------	----------------

**TROUBLE CODES MODE FLOW CHART
FOR A/T, ABS, AND AIRBAG F0: DISPLAY CODES**



MODE F2**TROUBLE CODES****CLEAR CODES PHASE**

4. To clear stored trouble codes, press the **ENTER** key to go to Clear Codes Phase. The **TECH 1** will display "EXECUTE CLEAR CODES?". Press **YES** to clear the codes, or press **NO** to return to the trouble code display without clearing the codes.

When **YES** is pressed, the **TECH 1** displays a "CLEARING CODES" message, followed by either a "CODES CLEARED" or a "CODES NOT CLEARED" message. After a few seconds the **TECH 1** automatically starts displaying trouble codes again. If no trouble codes are present at this time the "NO CODES" screen is displayed. When the **NO** key is pressed, the trouble codes are retained in the ECU and the **TECH 1** starts displaying trouble codes again.

LAMP CLEAR AND LOCK CLEAR FOR AIRBAG SYSTEM

For the Airbag system, after the trouble codes are displayed, press **EXIT** to return to the Trouble Codes menu.

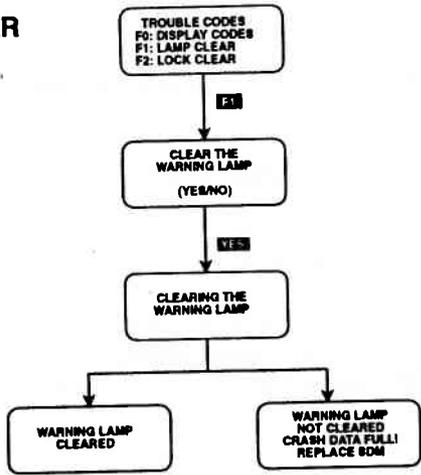
Select F1: Lamp Clear from the Trouble Codes menu, then press **YES** when the tester asks if you wish to clear the Warning Lamp. The tester attempts to clear the codes and informs you if the clearing was successful. If the Warning Lamp was not cleared, the tester informs you and instructs you to replace the SDM. Press **EXIT** to return to the Trouble Codes menu.

Select F2: Lock Clear from the Trouble Codes menu, press **YES** when the tester asks if you wish to clear the Near-Deploy Lock. The tester attempts to clear the Near-Deploy Lock, then informs you if the clearing was successful or not. If the clearing was successful, the tester instructs you to turn the ignition switch off, then on. Press **EXIT** to return to the Trouble Codes menu.

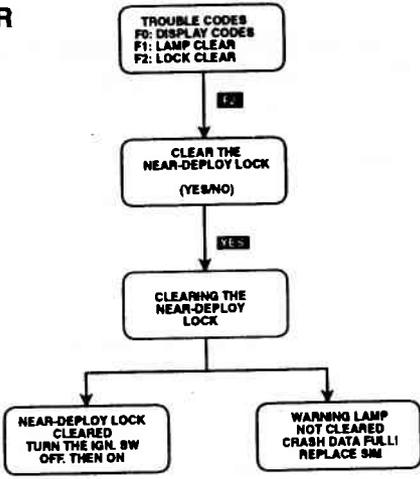
5. Press **EXIT** to terminate the trouble codes mode and return to the Select Mode menu.

TROUBLE CODES	MODE F2
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F1: LAMP CLEAR



F2: LOCK CLEAR



ACTIVE TECH 1 KEYS FOR TROUBLE CODES	
ENTER	Clear all stored ECU trouble codes.
YES	Clear all stored ECU trouble codes.
NO	Return to display trouble codes. Codes are not cleared.
EXIT	Terminate the trouble code display and return to the Select Mode menu.

The **SNAPSHOT** mode is not available when testing Airbag systems.

The purpose of the **SNAPSHOT** test mode is to help you isolate an intermittent or transient problem by storing data parameters before and or after the problem occurs. For **ABS**, the tester stops saving data when a current trouble code occurs.

When the **TECH 1** is operating in **SNAPSHOT** mode, it is constantly storing information about data parameters and trouble codes. A time and position index for the stored information is also saved.

The **TECH 1** stores all of the Data List parameters and trouble codes for the selected system. When the memory is full, the oldest (earliest) data collected is erased to make room for new information.

A "TRIGGER" tells the **TECH 1** when to stop collecting data. For the **SUZUKI 95-96 BCM Cartridge**, a trigger occurs when any trouble code is detected by the **ECU**.

TRIGGER CONDITION

The trigger condition defines the specific circumstances under which you want the trigger to be set. The possible trigger conditions are:

- F0: ANY CODE** If any trouble code is detected by the **ECU**, it will cause the trigger to be set.
- F1: SINGLE CODE** For **A/T** systems you can select a specific trouble code that must be detected before the trigger will be set. Step 3 in the Operating Procedure tells you how to enter the code. **F1: Single Code is not available when testing ABS.**
- F2: MANUAL TRIGGER** While operating the **SNAPSHOT** mode, you can always cause the trigger to be set by pressing the **ENTER** key.

VIEWING CAPTURED DATA

By selecting F3: REPLAY DATA from the SNAPSHOT menu you have the option of bypassing the Data Capture phase and displaying previously captured data. All data captured during SNAPSHOT will be retained in the **TECH 1** until it is overwritten by a new SNAPSHOT, or if the **TECH 1** is disconnected from the serial data link connector or the cigarette lighter for at least one-half hour.

PRINTING CAPTURED DATA

In addition, you can print the captured data, providing a hard copy of any selected data sample. A **TECH 1** printer is required to support this print function. See Step 11.

OPERATING PROCEDURE:

The operation of SNAPSHOT mode is divided into three phases: Set-Up (Steps 1-3), Data Capture (Steps 4-7), and Data Display (Steps 8-12).

SETUP PHASE

1. Press **F3** to select the SNAPSHOT mode from the Select Mode menu.
2. The trigger condition and review data options are displayed next in a self-scrolling Snapshot Options menu.

To select a trigger option, just press the Function Key displayed to the left of the desired trigger condition. To replay previously captured data, press **F3**.

NOTE: When you are testing the ABS, if a current trouble code is present when Snapshot Trigger Condition is selected, the tester displays the following message.

CURRENT TROUBLE
CODE SET, DATA
NO LONGER VALID
(EXIT)

MODE F3**SNAPSHOT**

To clear the trouble code(s), use **Mode F2: TROUBLE CODES** to display the current Trouble Codes. Repair the cause of the trouble code(s), then clear the codes using **Mode F2**. When all current trouble codes have been cleared, select **F3: SNAPSHOT** again to capture or display vehicle data.

3. To choose a specific ECU trouble code, press **F1** in the Snapshot Options menu. How to enter the code is explained below.

NOTE: This selection is not available when testing the ABS.

When the **TECH 1** screen displays "SNAPSHOT MODE, ENTER ECU CODE:, xx", use numeric keys **0-9** to enter the two digit trouble code number that you have selected, then press the **ENTER** key. The **TECH 1** will continue to store data until the specified trouble code is detected, or until you press the **EXIT** key. If the code you enter does not exist for the ECU being tested, an "INVALID CODE" message will be displayed and the code will have to be reentered.

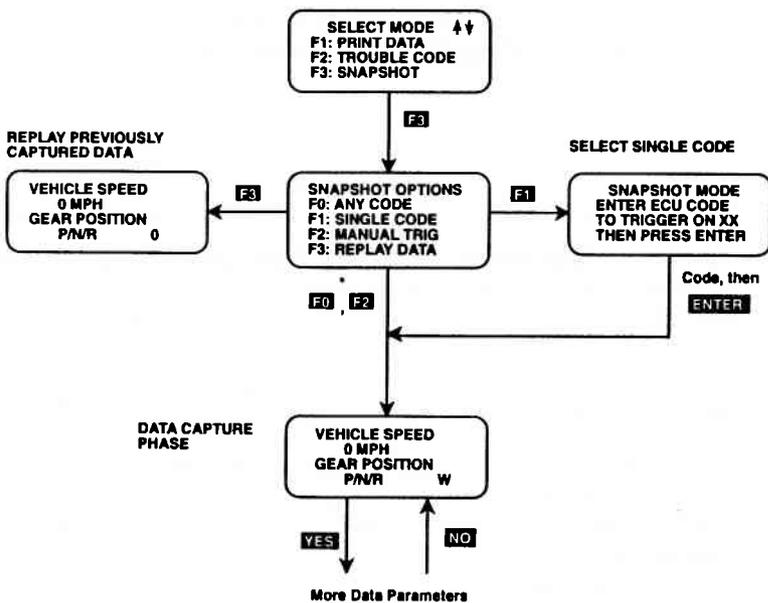
ACTIVE TECH 1 KEYS IN SNAPSHOT SETUP PHASE

EXIT	Return to Snapshot Options menu.
F0 - F2	Select trigger condition.
F3	Select Replay Data.
0 - 9	Select specific trouble code.
ENTER	Enter selected trouble code.

SNAPSHOT MODE F3

SNAPSHOT SETUP PHASE (Select Trigger Condition or Display Previously Captured Data).

To select a trigger condition, press the function key to the left of the desired trigger condition. To bypass the Data Capture phase and review previously captured data, press F3: REPLAY DATA.



MODE F3**SNAPSHOT****DATA CAPTURE PHASE**

4. Once the trigger condition is selected, the **TECH 1** begins storing A/T or ABS data parameters and trouble codes while displaying the Data List parameters.
5. The data is organized as a number of data 'samples'. The value or state of each parameter as well as all trouble codes are saved for each sample. The data display will indicate the 'waiting for trigger' condition with a flashing 'W' in the lower right-hand corner of the display. While waiting for the selected trigger, the **ENTER** key can always be used to force a trigger.



6. Once the trigger occurs, the **TECH 1** will continue to save data samples until its memory is full. The data display indicates that the trigger has occurred by replacing the flashing 'W' with a flashing 'T'. As soon as the memory is full, the data capture terminates automatically and the **TECH 1** goes to the Data Display phase.

For the ABS, if a current trouble code is detected while the Snapshot mode is active, a trigger automatically occurs and the tester advances to the data display phase. The trouble code that caused the trigger can be viewed by selecting sample +1.

7. Pressing **EXIT** will terminate the Data Capture phase. If the trigger has already occurred, the Snapshot mode will move to the Data Display Phase.

**ACTIVE TECH 1 KEYS IN
SNAPSHOT DATA CAPTURE PHASE**

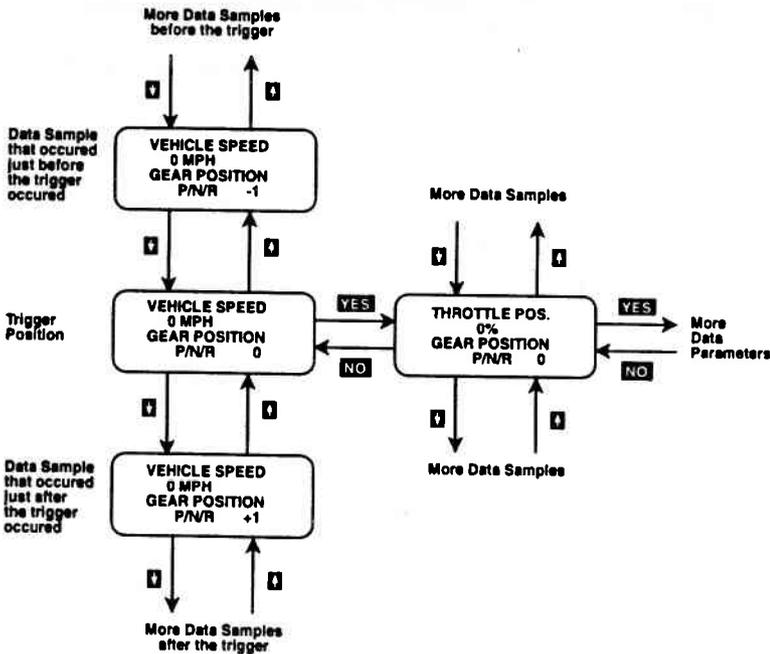
- YES & NO** Scroll through displayed data parameters.
- F0** Mark top displayed parameter as "fixed" for creating your own data pairs.
- F1** Mark bottom displayed parameter as "fixed" for creating your own data pairs.
- ENTER** Manual trigger.
- EXIT** Display captured data if trigger has already occurred.

MODE F3**SNAPSHOT****DATA DISPLAY PHASE**

8. The Data Display phase is indicated with a number (initially zero) in the lower right hand corner of the display. Select the data to be displayed by using the **YES** and **NO** keys.

NOTE

During the Data Display phase, the trouble codes present during each sample can be displayed by pressing **F2**.



- Use the **↑** and **↓** keys to select the desired sample. An index is displayed in the lower right-hand corner of the **TECH 1** display.

The trigger occurs between samples 0 and +1. Sample "0" is the sample immediately preceding the trigger; sample "-1" is the second sample preceding the trigger, and so on. The trouble code that caused the trigger can be viewed in sample +1. For ABS systems, parameter data displayed in sample +1 is invalid.

The index range may be less than the maximum number of samples if not enough time was allowed for data capture before or after the trigger.

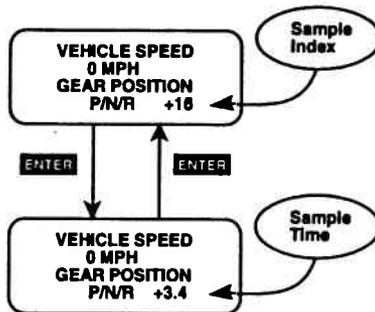
You can advance directly to the first, last, or trigger sample with the press of a button.

F4: Display first (earliest) sample

F5: Display trigger sample (0)

F6: Display last (most recent) sample

- While in the data display phase, pressing **ENTER** will cause the **TECH 1** to toggle between the sample index and sample time.



The sample time display gives the time in seconds (relative to the trigger sample) at which the **TECH 1** received the currently displayed sample. For example, a sample time of +3.4 means the sample was received 3.4 seconds after the trigger sample. A sample time of -2.6 seconds means the sample was received 2.6 seconds before the trigger.

11. The currently displayed sample may be printed if the tester connected to a compatible printer. To print the data, press **F8**. The **TECH 1** keyboard will be disabled while data is being sent to the printer.

SNAPSHOT data can also be printed in a tabular format using the Screen Print feature if the RS232C I/F Cartridge is installed or if you are using a **TECH 1** Series A tester. Screen Print is enabled by pressing **F6** until an "RS232 SETUP" menu is displayed. Press **F1** to enable the Screen Print function. Refer to the RS232C I/F or **TECH 1** Series A Operators Manual for more detail.

12. When you are finished viewing the sampled data, press **EXIT** to return to the Snapshot Options menu. If you are finished with the SNAPSHOT mode, press **EXIT** again to return to the select mode menu.

ACTIVE TECH 1 KEYS IN SNAPSHOT DATA DISPLAY PHASE

- | | |
|---------------------|--|
| YES & NO | Scroll through displayed data parameters. |
| ↑ & ↓ | Scroll through selected samples. |
| F0 & F1 | Fix top or bottom display parameter respectively. |
| F2 | Display trouble codes for current sample. |
| F4 | Advance to first (earliest) sample. |
| F5 | Advance to trigger sample (sample 0). |
| F6 | Advance to last (most recent) sample. |
| F8 | Print current data sample (if equipped with RS232C I/F Cartridge or TECH 1 Series A and printer). |
| ENTER | Toggle between sample index and sample time display. |
| EXIT | Return to Snapshot Options menu. |

6.0 FINISHING UP

After using the SUZUKI 95-96 BCM Cartridge, a few simple steps will insure that you get the most life out of your diagnostic tool.

First, remove power to the **TECH 1** by disconnecting the serial data link cable from the serial data link connector. You may want to inspect the cable and connector for any damage or corrosion.

Next, unplug the cartridge and store it and the cable in the travelling case.

If the **TECH 1** should become dirty you may wipe it off with a clean cloth and mild detergent or hand soap. Avoid using harsh solvents such as petroleum based cleaning agents, Benzene, Trichloroethylene, etc. Although the **TECH 1** is water resistant it is not waterproof so be sure to thoroughly dry off the **TECH 1** prior to storage.

7.0 TROUBLE CODE DESCRIPTIONS

All trouble codes that can be displayed with the SUZUKI 95-96 BCM Cartridge, along with a brief description of each code, are listed on the following pages.

TRANSMISSION TROUBLE CODES

ECU TROUBLE CODE	TECH 1 DISPLAY DESCRIPTOR	TROUBLE CODE DESCRIPTION
21	SHIFT SOLENOID NO. 1 OPEN	Shift Solenoid No. 1 open.
22	SHIFT SOLENOID NO. 1 SHORT	Shift Solenoid No. 1 short.
23	SHIFT SOLENOID NO. 2 OPEN	Shift Solenoid No. 2 open.
24	SHIFT SOLENOID NO. 2 SHORT	Shift Solenoid No. 2 short.
25	TCC SOLENOID OPEN	TCC Solenoid open.
26	TCC SOLENOID SHORT	TCC Solenoid short.
31	VSS NO SIGNAL	Vehicle Speed Sensor signal not received by the TCM. Vehicle Speed Sensor circuit failure.
32	THROTTLE POS. SIGNAL HIGH	Throttle Position Signal too high. Throttle Position Sensor or circuit failure.
33	THROTTLE POS. SIGNAL LOW	Throttle Position Signal too low. Throttle Position Sensor or circuit failure.
34	TRANS. RANGE SWITCH FAIL	Two transmission range signals or more fed to the TCM. Transmission range switch or circuit failure.

TRANSMISSION TROUBLE CODES (cont.)

36	VSS (TRANS. & METER) NO SIGNAL	Vehicle Speed Sensor (Transmission & Meter) Signal not received by the TCM. Vehicle Speed Sensor (Transmission & Meter) circuit failure.
37	INPUT REVOLUTION SENSOR FAIL	Input Revolution Sensor signal not received by the TCM. Input Revolution Sensor circuit failure.
41	PRESS. CONT. SOL OPEN	Pressure Control Solenoid open.
42	PRESS. CONT. SOL SHORT	Pressure Control Solenoid short.
51	COOLANT TEMP. SIGNAL FAIL	Coolant Temperature Signal is held low too long. Coolant Temperature Signal system or circuit problem.

ABS TROUBLE CODES

ECU TROUBLE CODE	TECH 1 DISPLAY DESCRIPTOR	TROUBLE CODE DESCRIPTION
15	G SENSOR FAIL	A failure condition is detected in the G sensor or its circuit. (4WD ONLY)
18	SENSOR ROTOR FAIL	ABS control time error is detected in the sensor rotor of one of the four wheels.
21	RF WHEEL SPEED SENSOR OPEN	Right front wheel speed sensor or circuit open. Unusual data is detected.
22	RF WHEEL SPEED SENSOR SHORT	Right front wheel speed sensor or circuit short. Unusual data is detected.
25	LF WHEEL SPEED SENSOR OPEN	Left front wheel speed sensor or circuit open. Unusual data is detected.
26	LF WHEEL SPEED SENSOR SHORT	Left front wheel speed sensor or circuit short. Unusual data is detected.
31	RR WHEEL SPEED SENSOR OPEN	Right rear wheel speed sensor or circuit open. Unusual data is detected.
32	RR WHEEL SPEED SENSOR SHORT	Right rear wheel speed sensor or circuit short. Unusual data is detected.
35	LR WHEEL SPEED SENSOR OPEN	Left rear wheel speed sensor or circuit open. Unusual data is detected.
36	LR WHEEL SPEED SENSOR SHORT	Left rear wheel speed sensor or circuit short. Unusual data is detected.

ABS TROUBLE CODES (cont.)

41	RF SOLENOID FAIL	A failure condition is detected in the right front solenoid.
45	LF SOLENOID FAIL	A failure condition is detected in the left front solenoid.
51	RR SOLENOID FAIL (4 CHANNEL ONLY)	A failure condition is detected in the right rear solenoid.
55	LR SOLENOID FAIL (4 CHANNEL ONLY)	A failure condition is detected in the left rear solenoid.
56	REAR SOLENOID FAIL (3 CHANNEL ONLY)	A failure condition is detected in the rear solenoid.
57	POWER SUPPLY FAIL	The voltage of the power supply has fallen.
61	PUMP MOTOR FAIL	A failure condition is detected in the pump motor (open, short).
63	FAIL-SAFE RELAY FAIL	A failure condition is detected in the fail-safe relay (open, short).
71	ABS CONTROL MODULE FAIL	A failure condition is detected in the ABS control module.
81	BASE BRAKE OR DIFFEREN SW FAIL (3 CHANNEL ONLY)	A failure condition is detected in the Base Brake or the Differential Switch circuit is open.
82	4WD SIGNAL CIRCUIT OPEN (3 CHANNEL ONLY)	4WD signal circuit open.

AIRBAG TROUBLE CODES

ECU TROUBLE CODE	TECH 1 DISPLAY DESCRIPTOR	TROUBLE CODE DESCRIPTION
15	PASSENGER INI. RES. TOO HIGH	Passenger initiator circuit resistances too high or open circuit.
16	PASSENGER INI. RES. TOO LOW	Passenger initiator circuit resistances too low.
21	DRIVER INITIATOR RES. TOO HIGH	Driver initiator circuit resistance is too high. Open circuit.
22	DRIVER INITIATOR RES. TOO LOW	Driver initiator circuit resistance is too low.
24	DRV. OR PSG. INI. SHORT TO GROUND	Driver or passenger initiator circuit short to ground.
25	DRV. OR PSG. INI. SHORT TO BATTERY	Driver or passenger initiator circuit short to battery voltage.
31	IGNITION VOLTAGE TOO HIGH	Ignition voltage is too high.
32	IGNITION VOLTAGE TOO LOW	Ignition voltage is too low.
35	CRASH SENSOR OR CIRCUIT FAIL	External crash sensor circuit short to ground or battery voltage or circuit open.
36	CRASH SENSOR FAIL	A failure condition is detected in the external crash sensor or circuit.
37	LOW PRES. SENSOR CIRCUIT SHORT	Low pressure sensor circuit short to ground or battery voltage or short in wiring.
38	LOW PRES. SENSOR CIRCUIT OPEN	Low pressure sensor open (faulty inflator) or circuit open.

AIRBAG TROUBLE CODES (cont.)

51	CRASH RECORDED	Sensing & diagnostic module (SDM) recorded crash condition.
61	WARNING LAMP DEFECT	A failure condition is detected in the warning lamp circuit.
71	SDM FAIL	A failure condition is detected in the Sensing & Diagnostic module (SDM). Replace SDM.

8.0 DATA LIST PARAMETER DESCRIPTIONS

The **TECH 1** is capable of displaying a wide variety of data parameters in Data List and Snapshot modes. The ECU sends the **TECH 1** information regarding the state of the ECU and the **TECH 1** 'translates' and displays this information in the form of parameters selected by the service technician. This section describes those parameters.

There are two basic types of ECU parameters: discrete and analog. Discrete parameters are 'bits' of information and can be in only one of two distinct states (ON/OFF, OPEN/CLOSED, etc.). Switches and solenoids are examples of discrete parameters. Analog parameters are used to represent quantities and are displayed as a value with appropriate units. Examples of analog parameters include Vehicle Speed, Throttle Position, Battery Voltage, etc.

Parameters are grouped by ECU function. The parameters are listed in alphabetical order within each category. The categories are:

- 1) General
- 2) Electrical
- 3) Miscellaneous

CATEGORY DESCRIPTIONS

- 1) General Parameters are those that affect or are effected by many different ECU systems such as Vehicle Speed, Coolant Temp. Signal, and Wheel Speed.
- 2) Electrical Parameters can be used to help diagnose vehicle electrical problems and include Battery Voltage and Pump Motor Voltage.
- 3) The Miscellaneous Parameters section includes parameters such as Brake Switch, Warning Lamp, and Gear Position.

DESCRIPTOR FORMAT

Following is a description of all parameters that can be displayed with the SUZUKI 95-96 BCM Cartridge. Included is: 1) a listing of all the parameters available for each category; 2) a description of the parameter; 3) the units, and the range of the analog parameters; 4) the state of the discreet parameters.

The parameters are listed below according to category. The ECU related to the parameter is also indicated.

GENERAL PARAMETERS

SYSTEM

Coolant Temp. Signal	A/T
Input Revolution	A/T
Pressure Control Solenoid	A/T
Throttle Position	A/T
Vehicle Speed	A/T
Wheel Speed (RF, LF, RR, LR)	ABS

ELECTRICAL PARAMETERS

SYSTEM

Battery Voltage	A/T
Battery Voltage	ABS
Driver Initiator Resistance	AIRBAG
G-Sensor	ABS
Ignition Voltage	AIRBAG
Passenger Initiator Resistance	AIRBAG
Pump Motor Voltage	ABS

MISCELLANEOUS PARAMETERS

SYSTEM

4WD-L Switch	A/T
Brake Switch	ABS
Brake Switch	A/T
Gear Position	A/T
Hydraulic Unit Switch	ABS
Mode Select Switch	A/T
O/D Off Switch	A/T
Park/Neutral Position Signal	A/T
Shift Solenoid No. 1 & No. 2	A/T
TCC Solenoid	A/T
Transmission Range	A/T
Warning Lamp	AIRBAG

GENERAL PARAMETERS

COOLANT TEMP SIGNAL (A/T)

STATES	
HIGH/LOW	

Coolant Temperature Signal is used for the overdrive control. When this signal is LOW, the gear position is not shifted to 4th.

INPUT REVOLUTION (A/T)

UNITS	RANGE
RPM	0 - 6375

Input Revolution is the revolution of the forward clutch drum (input shaft) in the transmission case. It is computed by reference pulses coming from the forward clutch cylinder revolution sensor in the transmission.

PRESSURE CONTROL SOLENOID (A/T)

UNITS	RANGE
%	0.0 - 100

Pressure Control Solenoid is used for the shift change control in the transmission. It is operated by timing pulses coming from the TCM.

THROTTLE POSITION (A/T)

UNITS	RANGE
%	0.0 - 100

Throttle Position is a TCM internal parameter. It is computed by duty signal coming from the Engine Control Module (ECM). Throttle Position is used for the shift solenoid control in the TCM.

VEHICLE SPEED (A/T)

UNITS	RANGE
KPH	0 - 255
MPH	0 - 159

Vehicle speed is a TCM internal parameter. It is computed by timing pulses coming from the vehicle speed sensor for A/T. Vehicle speed is used for the shift solenoid control in the TCM.

**RF WHEEL SPEED
LF WHEEL SPEED
RR WHEEL SPEED
LR WHEEL SPEED
(ABS)**

UNITS	RANGE
KPH	0 - 285
MPH	0 - 177

Wheel speed is an ABS control module internal parameter. It is computed by reference pulses from the Wheel Speed Sensor.

ELECTRICAL PARAMETERS

BATTERY VOLTAGE (A/T)

UNITS	RANGE
VOLTS	0.0 - 25.4

Battery Voltage is an analog input signal read by the TCM.

BATTERY VOLTAGE (ABS)

STATES
LOW/HIGH

Battery Voltage is an analog input signal read by the ABS control module. Certain ABS control module functions will be modified if the Battery Voltage falls below or rises above programmed thresholds.

DRIVER INITIATOR RESISTANCE (AIRBAG)

UNITS	RANGE
OHMS	0 - 12.75

Driver Inflator Resistance is an SDM internal parameter.

G-SENSOR (ABS)

UNITS	RANGE
VOLTS	0 - 9.80
G	-2.50 - 7.32

G-Sensor is an analog input signal read by the ABS control module.

IGNITION VOLTAGE (AIRBAG)

UNITS	RANGE
VOLTS	0 - 28.05

Ignition Voltage is an analog input signal read by the SDM.

PASSENGER INITIATOR RESISTANCE (AIRBAG)

UNITS	RANGE
OHMS	0 - 12.75

Passenger Initiator Resistance is an SDM internal parameter.

**PUMP MOTOR VOLTAGE
(ABS)**

STATES
LOW/HIGH

Pump Motor Voltage is an analog input signal read by the ABS control module. Certain ABS control module functions will be modified if the Pump Motor voltage falls below or rises above programmed thresholds.

MISCELLANEOUS PARAMETERS

**4WD-L SWITCH
(A/T)**

STATES
OFF/ON

4WD-L signal is fed to the TCM from the 4WD-L switch. This switch signal is used for timing of shift change.

**BRAKE SWITCH
(A/T)**

STATES
OFF/ON

This switch signal informs the TCM whether the brake is active or not.

**BRAKE SWITCH
(ABS)**

STATES
OFF/ON

This switch signal informs the ABS control module whether the brake is active or not.

**GEAR POSITION
(A/T)**

STATES
1ST/2ND/3RD/4TH/ or P/N/R

This parameter indicates the current gear position. It is computed by the throttle position coming from the Engine Control Module (ECM) and the vehicle speed.

**HYDRAULIC UNIT SWITCH
(ABS)**

STATES
OFF/ON

This parameter indicates whether the ABS is functional or not.

**MODE SELECT SWITCH
(A/T)**

STATES
NORMAL/POWER/SNOW

The Mode signal is fed to the TCM from the Mode Select Switch. This switch signal is used for timing of the shift change.

**O/D OFF SWITCH
(A/T)**

STATES
OFF/ON

O/D Off Switch is used for the over drive control. When this signal is ON, the gear position is not shifted to 4th.

**PARK/NEUTRAL POSITION
SIGNAL
(A/T)**

STATES
R/D/2/L or P/N

This parameter indicates whether the D, R, 2, L-range position is selected or if P, N-range is selected. When this signal is ON, the idle speed is increased.

**SHIFT SOLENOID NO. 1
SHIFT SOLENOID NO. 2
(A/T)**

STATES
OFF/ON

Shift Solenoid is used for shifting the transmission up and down. It is turned ON or OFF by a signal from the TCM. Gear position is decided by combination of ON or OFF.

**TCC SOLENOID
(A/T)**

STATES
OFF/ON

TCC Solenoid is used for the TCC Control mode. It is turned ON or OFF by a signal from the TCM.

**TRANSMISSION RANGE
(A/T)**

STATES
P/R/N/D/2/L/FAIL

Transmission Range is fed to the TCM from the transmission range switch. This signal indicates when the gear is shifted to each range.

**WARNING LAMP
(AIRBAG)**

STATES
OFF/ON

This parameter tells whether the warning lamp is ON or OFF.

APPENDICES

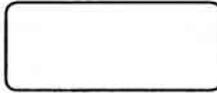
A. IF YOU'RE HAVING A PROBLEM

B. GLOSSARY AND ABBREVIATIONS

A. IF YOU'RE HAVING A PROBLEM

Although the **TECH 1** was designed to give you years of trouble-free service, occasional problems may occur that require special attention. Some of these problems may be corrected with a few simple steps. Examples of most of the displays which you might see under abnormal conditions are shown. In addition, the most likely cause for the condition is given as well as other possible causes and recommendations on how to isolate or eliminate the problem. If the problem appears to be in the **TECH 1**, perform the Self-test (described in the **TECH 1** Operators Manual.)

1.



Blank Screen

MOST LIKELY CAUSE:

- Ignition switch OFF.

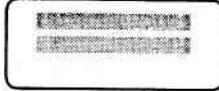
OTHER POSSIBLE CAUSES:

- Faulty cable.
- **TECH 1** power supply is malfunctioning.
- No power is applied to the **TECH 1**.

RECOMMENDATIONS:

- Plug the **TECH 1** into another vehicle to verify proper operation.

2.



MOST LIKELY CAUSE:

- Two master cartridges are installed.

OTHER POSSIBLE CAUSES:

- Master cartridge is malfunctioning.
- **TECH 1** is malfunctioning.

RECOMMENDATIONS:

- Make sure that only one master cartridge is installed in the **TECH 1**.
- Remove all cartridges and see if "MASTER CARTRIDGE MISSING OR MALFUNCTIONING" message is displayed. If it is, try installing another master cartridge.

3.



MOST LIKELY CAUSE:

- Master cartridge is not installed.

OTHER POSSIBLE CAUSES:

- Dirty contacts on the master cartridge connector.
- Two master cartridges installed.

RECOMMENDATIONS:

- Verify that a master cartridge is installed.
- Clean contacts on master cartridge connector with alcohol.
- Try a different master cartridge.

4.

F0: ENGLISH
F1: ニホンゴ
F2: DEUTSCH
F3: FRANCAIS

OR

SUZUKI 95-96
AT/ABS/AIRBAG
SYSTEM

Keyboard or display locked up or program sporadically returns to first page

MOST LIKELY CAUSE:

- Serial data link cable loose or bad.

OTHER POSSIBLE CAUSES:

- Master Cartridge loose or dirty contacts.
- **TECH 1** malfunction.

RECOMMENDATIONS:

- Cycle power to the **TECH 1** (unplug & replug the serial data link connector).
- Check **TECH 1** cartridge socket and cartridge edge connector.
- Check serial data link cable & connector for wear or corrosion.

5.

POSSIBLE WRONG
ECU SELECTED, NO
DATA, CHECK LINK
AND RESELECT

SERIAL DATA FAIL
CHECK DATA LINK
AND RESELECT
(EXIT)

TECH 1 is not receiving data

MOST LIKELY CAUSE:

- ECU-serial data link connector cable problems.
- Stop in ABS control module communication function (refer to the NOTE on Page 5-3).

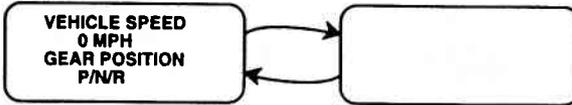
OTHER POSSIBLE CAUSES:

- Serial data link cable loose or bad or connector pins loose or corroded.
- Bad ECU.

RECOMMENDATIONS:

- Verify a good serial data link cable connection.
- Cycle power to the **TECH 1**.
- Run the **TECH 1** Self-test.

6.



Data List parameters flash on and off.

MOST LIKELY CAUSE:

- Serial data link cable loose or bad.

OTHER POSSIBLE CAUSES:

- Serial data link cable connector pins loose or corroded.
- ECU-serial data link connector cable problems.
- Intermittent ECU problem.

RECOMMENDATIONS:

- Verify a good serial data link cable connection.
- Cycle power to the **TECH 1**.

B. GLOSSARY AND ABBREVIATIONS

4WD	Four wheel drive
ABS	Antilock Brake system
A/T	Automatic Transmission
CONTR	Control
DIFFEREN	Differential
DLC	Data Link Connector (SDL connector)
DRV	Driver
ECU	Electronic Control Unit
INI	Initiator
LF	Left Front
LR	Left Rear
O/D	Overdrive
POS	Position
PRESS	Pressure
PSG	Passenger
RES	Resistance
RF	Right Front
RR	Right Rear
RS232C	Standard Serial Communication interface
SDL	Serial Data Link
SDM	Sensing and Diagnostic Module
SENS	Sensor
SOL	Solenoid
SPD	Speed
SW	Switch
TCC	Torque Converter Clutch
TCM	Transmission Control Module
TEMP	Temperature
THROT	Throttle
TP	Throttle Position
VIN	Vehicle Identification Number
VSS	Vehicle Speed Sensor