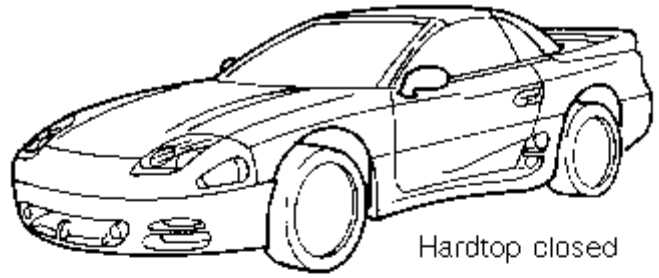
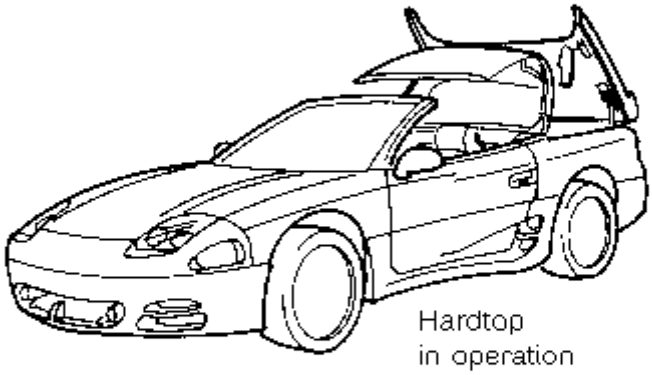
PC User's Manual

ASC Incorporated
Computerized
Diagnostic System:

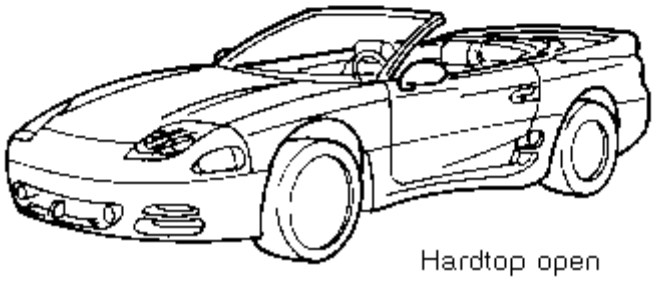
- **System Diagnostics**
- **Software Installation**
- **Auto-configuration**



Hardtop closed



Hardtop
in operation



Hardtop open

MITSUBISHI 3000GT SPYDER

ASC p/n E-45X8-T002-BXXX

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INTRODUCTION

This PC User's Manual is for the Mitsubishi 3000GT Spyder. This manual should be used in conjunction with the Service Manual Supplement (Volume 3) when servicing or re-pairing the vehicle.

There are specific instructions and cautions that appear in the Service Manual Supplement that should be strictly adhered to. Otherwise, personal injury or damage to the vehicle could result.

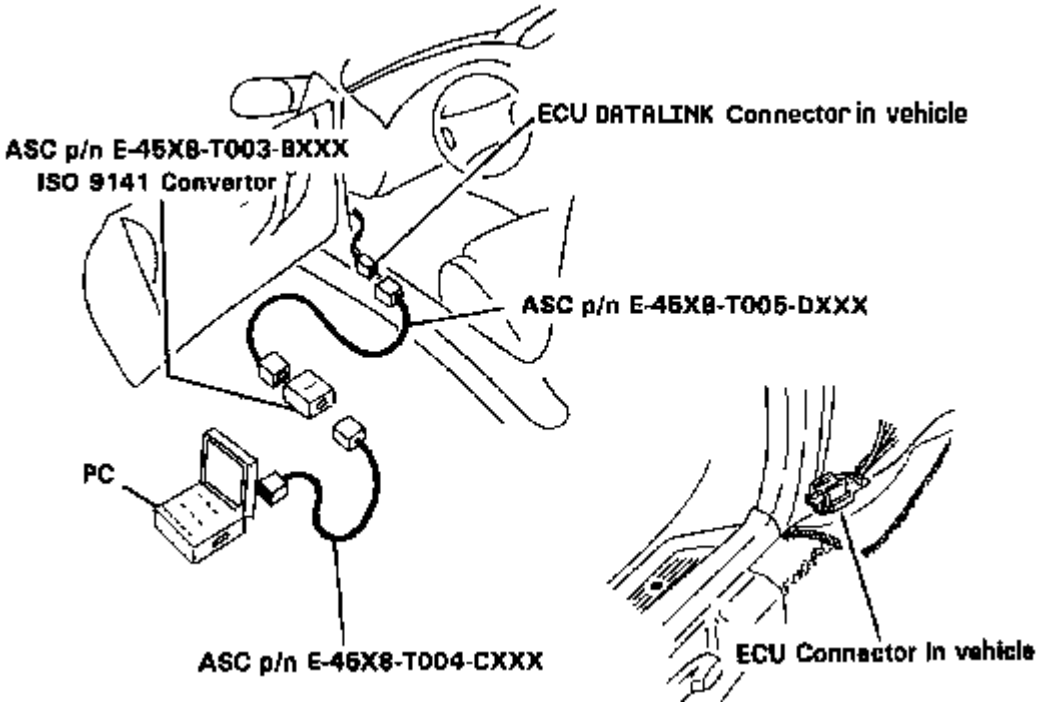
Caution:
Mechanical adjustments to, or replacement of components of the retractable hardtop system, with the exception of hard and soft trim, will require that the hardtop ECU be run through "auto-configuration" using the ASC INCORPORATED computerized diagnostic system. When applicable DO NOT perform any adjustment or replacement of those retractable hardtop components without having the latest version of the ASC INCORPORATED diagnostic system.

The Spyder hardtop ECU includes control of 3.5 retractable hardtop axes: hardtop, hard tonneau, tonneau unlatch, and header latch/unlatch.

The hardtop ECU also controls the three vehicle window systems: passenger door window, driver door window, and retractable quarter window system.

PROCEDURE FOR RUNNING THE DIAGNOSTICS AND AUTO-CONFIGURATION PROGRAM

1. Connect the PC to the ECU



Connect the components as shown in the illustration above. The ECU connector in the vehicle is located behind the carpet at the base of the cowl near the floor.

2. Connect a 12V battery charger to the vehicle battery to maintain battery voltage. Use slow charging of 5 - 10 amps.

Caution:
When batteries are being charged, an explosive gas forms beneath the cover of each cell. Do not smoke near batteries on charge or which have been recently charged. Do not break live circuits at the terminals of the batteries on charge. A spark will occur where the live circuit is broken. Keep all open flames away from the battery.

Battery electrolyte temperature may temporarily be allowed to rise to 55/C (131/F). Increase of electrolyte temperature above 55 /C (131/F) is harmful to the battery, causing deformation of battery cell, decrease in life of the battery, etc.

3. Turn the ignition switch to the ON position.

4. Wake up the ECU from sleep mode.

The hardtop ECU must be awakened from its sleep mode for the PC to communicate with it. The hardtop ECU will immediately go to sleep after the hardtop has been fully closed or fully opened. Awakening the ECU can be performed several ways:

NOTE:
The ECU should be awake if the hardtop or tonneau is not fully open or closed.

- With the hardtop fully open or closed, press and hold the passenger window switch to keep the ECU awake, or;
- Momentarily press the hardtop **"OPEN"** switch (if the hardtop is closed) or **"CLOSE"** switch (if the hardtop is open) until the chime and indicator are active.

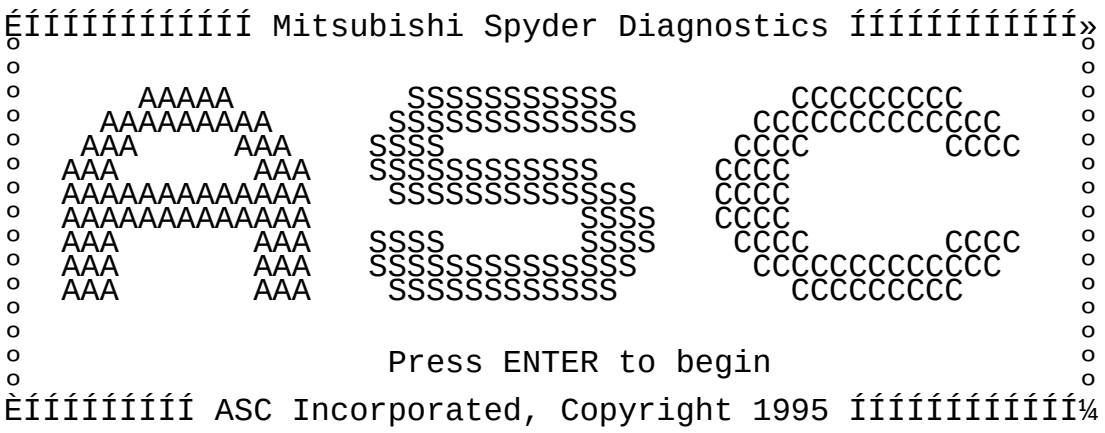
5. Execute the PC software.

   The computer will come from ASC configured to execute the auto-configuration software automatically on power-up. No additional user intervention is needed after turning on the PC.

   Switch on the PC (refer to your PC Owner's Manual for more information).

   The computer will perform normal self-test and boot functions.

   You will see the opening screen shown below:



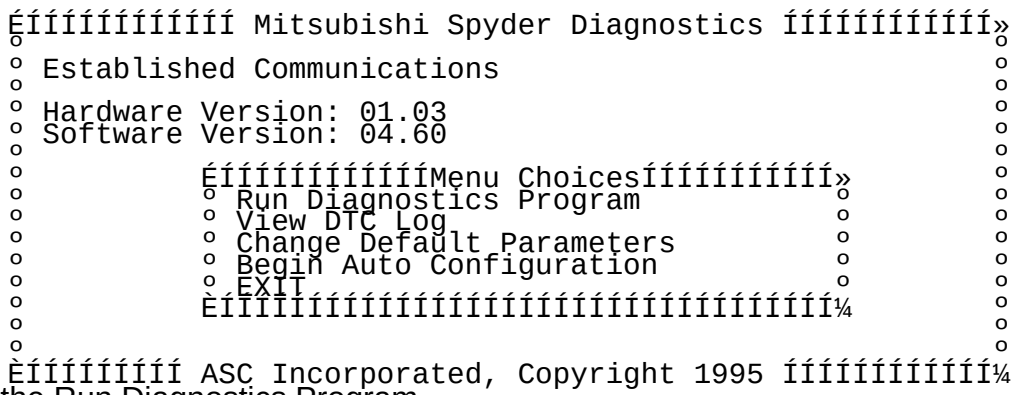
6. Press **{ENTER}** to begin the program.

7. After **{ENTER}** is pressed the **DIAGNOSTICS MAIN MENU** will appear.

   Use the up (↑) or down (↓) arrow keys to highlight the desired selection from the menu. Then press **{ENTER}** to make your selection.

   To end the program, either highlight the **"EXIT"** selection and press **{ENTER}**, or press the **{Esc}** key.

   NOTE: If you get a screen with a blank box, you have not established communication with the ECU. Check all connections then repeat Step 6.



8. Run the Run Diagnostics Program

   (1) To view the diagnostics screen use the up (↑) or down (↓) arrow keys to highlight the "**Run Diagnostics Program**" selection from the **Main Menu**. Press **{ENTER}** to make your selection. You will see the screen below.

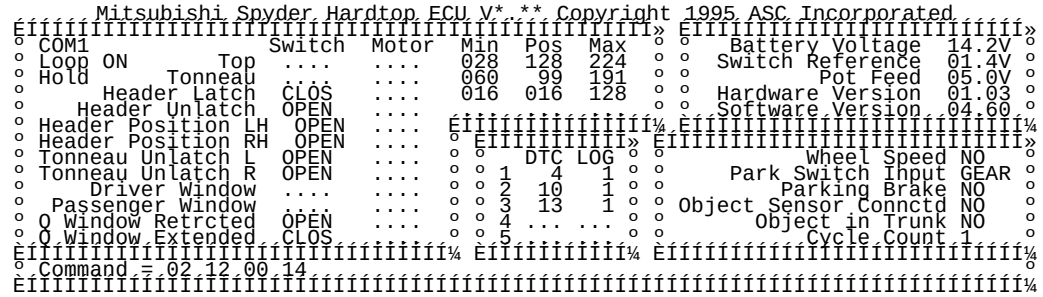
   NOTE: If at anytime you want to escape to the **Main Menu** press **{Esc}**, then choose **Y** or **N**.

   (2) This run diagnostics screen shows the data the ECU has collected since it left the factory or since it was last replaced. It also shows current status of general

ECU inputs and outputs. The screen will constantly update the data as the system is being operated.

(3) For continuous updates to the axis position display, make sure the **Loop Mode** is **ON** by pressing the **L** key so that **Loop ON** appears in the top left corner of the display.

(4) To return to the **Position Display** mode from any other mode press the **P** key.



✎ Clearing the DTC log, if desired.

1. Press the **U** key to ask to clear the DTC log.
2. You will be prompted whether you want to clear the log. Press **Y** if you want to clear the log; the PC will automatically send all the necessary commands to the ECU. Press **N** if you decide not to clear the DTC log.

NOTE:

If you decide to clear the DTC Log, record the DTCs for future reference before clearing the log.

✎ Screen legends

Hardtop Switch: Changes from " **. . . .**" to **OPEN** or **CLOSE** when the hardtop **"OPEN"/"CLOSE"** switch is pressed.

Tonneau Switch: Changes from "**. . . .**" to **UP** or **DOWN** when the tonneau **"OPEN"/"CLOSE"** switch is pressed.

Header Latch/Unlatch: Changes from **CLOS** to **OPEN** depending on the status of the switches. The words **Latch** or **Unlatch** will be highlighted to show the header latch state inside the ECU.

Header Position LH/RH: Changes from **CLOS** to **OPEN** depending on the status of the switches. The switches should register **CLOS** if the hardtop is fully closed.

Tonneau Unlatch Left/Right: Changes from **CLOS** to **OPEN** depending on the status of the switches. The switches should register **CLOS** when the tonneau is fully closed.

Driver Window Switch: The PC does not display the driver window switch status.

Passenger Window Switch: Changes from " **. . . .** " to **OPEN** or **CLOSE** when the **Passenger Window Switch** is pressed.

Q Window Retracted/Extended: Changes from **CLOS** to **OPEN** depending on the status of the position sensors. The **Extended** sensor should show **CLOS** and the **Retracted** sensor should show **OPEN** when the quarter windows are fully extended (closed). The **Retracted** sensor should show **CLOS** and the **Extended** sensor should show **OPEN** when the quarter windows are fully retracted (open).

Hardtop Motor (hydraulic pump/motor): Changes from "**. . . .**" to **CLOSE** or **OPEN** when the pump motor is **ON**.

Tonneau Motor (hydraulic pump/motor): Changes from "**. . . .**" to **OPEN** or **CLOSE** when the pump motor is **ON**.

Header Latch Motor: Changes from "**. . . .**" to **UP** or **DOWN** when the motor is **ON**.

Tonneau Unlatch Motors: Changes from "**. . . .**" to **ON** when the motor is **ON**.

Driver Window Motor: The PC displays the driver window motor status only when operated through the hardtop switch.

Passenger Window Motor: Changes from "**. . . .**" to **UP** or **DOWN** when the motor is **ON**.

Quarter Window Motor: Changes from "**. . . .**" to **CLOS** or **OPEN** when the motor is **ON**.

Pot (Potentiometer) Readings (Min Pos Max): The center section of the screen shows the measured values of the potentiometer for each axis. Values are in decimal notation, 0 to 255. The **Min** value is the low limit for that axis. The **Max** value is the high limit for that axis. The **Header Latch** entry is a "simulated" axis, and does not reflect a reading from an actual potentiometer.

Battery Voltage: Battery voltage as measured by the ECU (approximate). The ECU will not operate if this voltage is below 10V and above 16V. Hardtop operation becomes very sluggish when the voltage drops below 11V.

Switch Reference: Switch reference voltage as measured by the ECU (approximate). This voltage should be 1.3 - 1.7 volts at all times.

Pot (Potentiometer) Feed : Pot feed voltage as measured by the ECU (approximate). This voltage should be 4.8 - 5.2 volts at all times.

Hardware Version: The hardware revision number reported by the ECU.

Software Version: The software revision number reported by the ECU.

Wheel Speed: Indicates vehicle speed as sensed by the ECU from a pulse train received from an ABS wheel speed sensor. **Yes** means you have wheel speed and the vehicle is moving too fast; the ECU will not allow the hardtop to move. **No** means the vehicle is stationary or moving slowly enough to allow the hardtop to move.

Parking Switch Input: Status of the automatic transmission. **PARK** means that the transmission is in Park and the ECU will allow the top to move. **GEAR** means that the vehicle is in gear and the ECU will not allow the top to move.

Parking Brake: Status of the parking brake. **YES** means that the parking brake is applied and the ECU will allow the top to move. **NO** means that the parking brake is not applied and the ECU will not allow the top to move. NOTE: This applies only to vehicles with manual transmission.

Object(-In-Trunk) Sensor Connected: Indicates **YES** if the Object-In-Trunk Sensor (OTS) is connected, **NO** if it is not connected. The ECU will not allow the hardtop to go into the cargo/hardtop stowage area if the OTS is not connected.

Object In Trunk: Indicates **YES** if the OTS registers an object in the cargo/hardtop stowage area, **NO** if there is no object in there. The ECU will not allow the hardtop to go into the cargo/hardtop stowage area if the OTS registers an object in there.

Cycle Count: Number of complete hardtop system cycles (full close-to-full open-to-full close = one complete cycle) since the vehicle left the factory or since the ECU was last replaced.

DTC Log: Indicates the status of the DTCs and displays up to 5 entries. The first number is the entry number (1-5). The second number is the DTC. The third number is the number of times this error has been logged. If the fault is active, the DTC is highlighted.

9. Run Auto-configuration.

   Auto-configuration consists of moving each axis, one at a time and automatically changing and recording the end limits.

   (1) Press the up (↑) or down (↓) arrow to highlight "**Begin Auto Configuration**" on the **Main Menu**. Press **{ENTER}** to make this selection.

   The PC will begin by setting up a number of parameters in the ECU. This may take several seconds. You will then see the warning screen below.

   (2) Press **{ENTER}** to continue with auto-configuration.

   NOTE: You may return to the **Main Menu** at any time during auto-configuration by pressing the **{Esc}** key.

```
ÉÍÍÍÍÍÍÍÍÍ Mitsubishi Spyder Auto-Configuration ÍÍÍÍÍÍÍÍ»
º                                                        º
º   CAUTION:  Make sure that there is physical          º
º             clearance for both the tonneau and the     º
º             hardtop to move through their entire       º
º             range of motion.                           º
º                                                        º
º             Make sure no one is on or near the vehicle º
º             which could cause injury when the          º
º             hardtop is operated.                       º
º                                                        º
º             Make sure the cargo/hardtop stowage area   º
º             is empty.                                  º
º                                                        º
º                                                        º
º   Press ENTER to begin auto-configuration.             º
º                                                        º
ÈÍÍÍÍÍÍÍÍÍÍ ASC Incorporated, Copyright 1995 ÍÍÍÍÍÍÍÍÍ¼
```

4. The PC will prompt you to **Press Hardtop OPEN Switch**. The door and quarter windows will begin to open. Hold the switch until you receive a prompt to **Release Hardtop OPEN Switch**. When the switch is released the following screen will appear.

```
ÉÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ Mitsubishi Spyder Auto-Configuration ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ»
º                                                                              º
º MOVE THE WINDOWS DOWN/RETRACTED                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º ÉÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ»  º
º º                                                                          º  º
º º  Are the quarter windows fully retracted?                              º  º
º º                                                                          º  º
º º  Press Y if the windows are fully retracted.                           º  º
º º  Press N if the windows are not fully retracted.                       º  º
º º  Press A to abort auto-configuration.                                  º  º
º º                                                                          º  º
º ÈÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ¼  º
º                                                                              º
º                                                                              º
º                                                                              º
ÈÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ ASC Incorporated, Copyright (c) 1995 ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ¼
```

NOTE: If the windows are not fully retracted and **N** has been pressed, press and hold the **hardtop OPEN switch** again. If the windows are now fully retracted, press **Y** to continue. If the windows are still not fully retracted, press **A** to, abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.

5. When Step 4 is complete and **Y** has been pressed the PC will prompt you to **Press Hardtop OPEN Switch**. The hard tonneau will unlatch and begin to open. Hold the switch until a prompt is received to **Release Hardtop OPEN Switch**. When the switch is released the following screen will appear.

```
ÉÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ Mitsubishi Spyder Auto-Configuration ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ»
º                                                                              º
º MOVE THE WINDOWS DOWN/RETRACTED                                              º
º                                                                              º
º MOVE THE TONNEAU UP (OPEN)                                                   º
º                                                                              º
º                                                                              º
º                                                                              º
º ÉÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ»  º
º º                                                                          º  º
º º  Is the tonneau fully open?                                            º  º
º º                                                                          º  º
º º  Press Y if the tonneau is fully open.                                 º  º
º º  Press N if the tonneau is not fully open.                             º  º
º º  Press A to abort auto-configuration.                                  º  º
º º                                                                          º  º
º ÈÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ¼  º
º                                                                              º
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º                                                                              º
ÈÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ ASC Incorporated, Copyright 1995 ÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍÍ¼
```
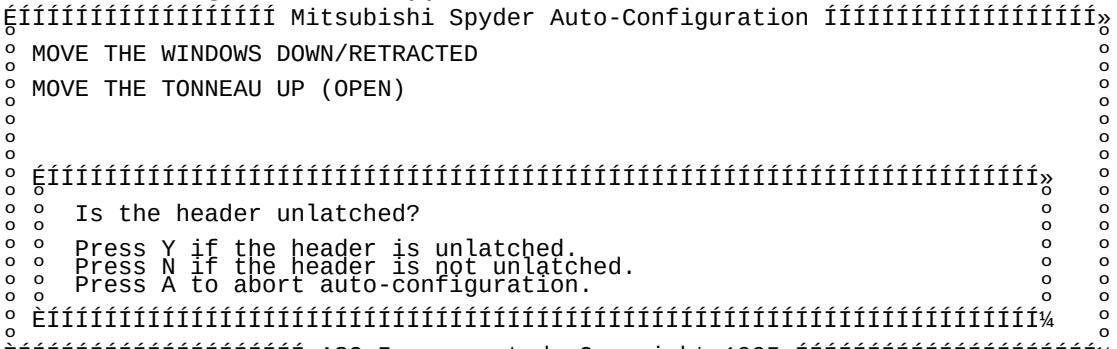
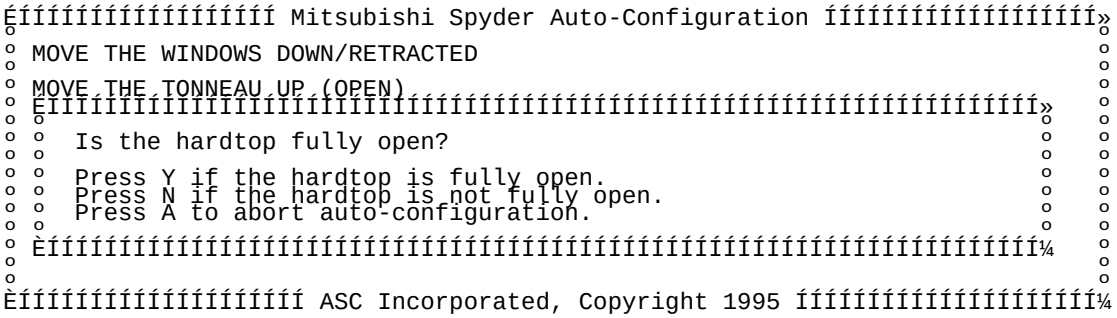

NOTE: If the tonneau is not fully open and **N** has been pressed, press and hold the **hardtop OPEN switch** again. If the tonneau is now fully open, press **Y** and continue. If the tonneau is still not fully open, press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.

6. When Step 5 is complete and **Y** has been pressed the PC will prompt you to **Press Hardtop OPEN Switch**. The header latches will unlatch. Hold the switch until a pompt is received to **Release Hardtop OPEN Switch**. When the switch is released the following screen will appear.



NOTE: If the header is not fully unlatched and **N** has been pressed, press and hold the **hardtop OPEN switch** again. If the header is now unlatched, press **Y** and continue. If the header is still not unlatched press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.

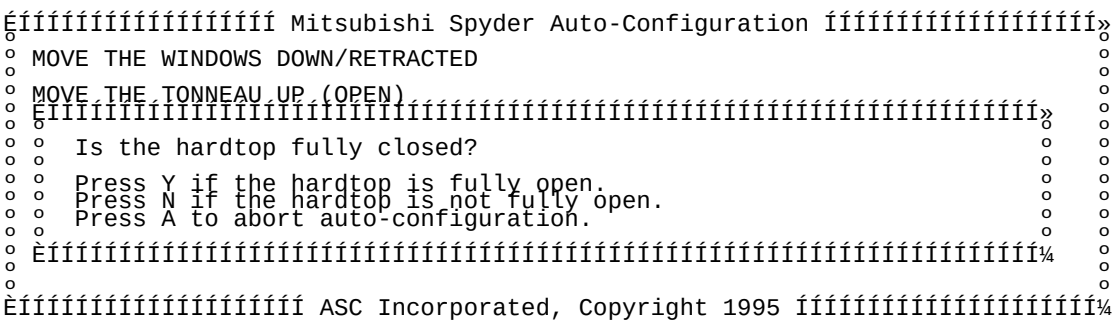
7. When Step 6 is complete and **Y** has been pressed the PC will prompt you to **Press Hardtop OPEN Switch**. The hardtop will move to its fully open position. Hold the switch until a prompt is received to **Release Hardtop OPEN Switch**. When the switch is released the following screen will appear.



NOTE: If the hardtop is not fully open and **N** has been pressed, press and hold the **hardtop OPEN switch** again. If the hardtop is now fully open, press **Y** and continue. If the hardtop is still not fully open press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.

8. When Step 7 is complete and **Y** has been pressed the PC will prompt you to **Press Hardtop CLOSE Switch**. The hardtop will move to its fully closed position. When the PC detects that the hardtop is in the fully closed position, it will prompt you to **Release the Hardtop CLOSE Switch**.

   When the switch is released the following screen will appear.



NOTE: If the hardtop is not fully closed, and **N** has been pressed, press and hold the **hardtop CLOSE switch** again. Release the hardtop switch when the hardtop reaches its fully closed position. If the hardtop is now fully closed press **Y** and continue. If the hardtop is still not fully closed, press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.

Caution:

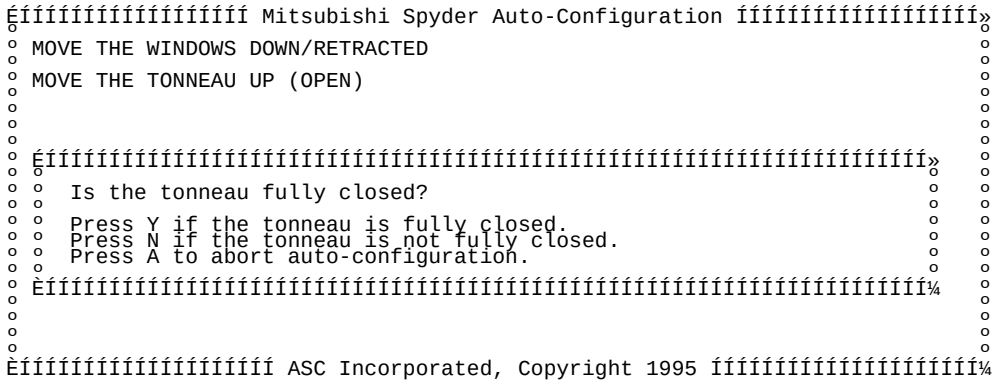
During auto-configuration the safety-stop feature will be ignored when the hardtop is being closed.

When Step 8 is complete and **Y** has been pressed the PC will prompt you to **Press Hardtop CLOSE Switch**. The header latches will latch. The PC will detect that the header latches are latched and will prompt you to **Release Hardtop CLOSE Switch**. No screen will appear.

9. The PC will prompt you to **Press Hardtop CLOSE Switch**. The tonneau will begin to close. When the PC detects that the tonneau is in the fully closed position it will prompt you to **Release Hardtop CLOSE Switch**.

   If the PC prompts you to **Release the Hardtop CLOSE Switch** before the tonneau is in its fully closed position, release the switch then press and hold the switch again. Release the **CLOSE** switch when the tonneau reaches its full closed and latched position. When the switch is released the following screen will appear.

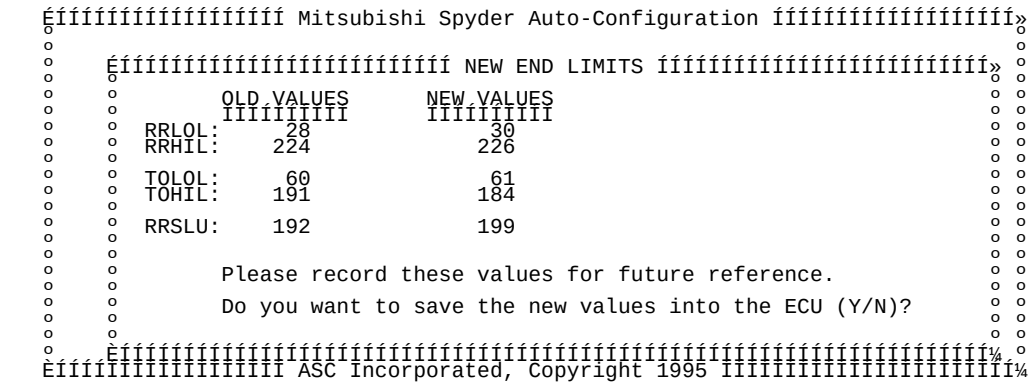
   NOTE: If the tonneau is not fully closed, and **N** has been pressed, press and hold the **hardtop CLOSE switch** again. Release the hardtop switch when the tonneau reaches its fully closed position. If the tonneau is now fully closed press **Y** and continue. If the tonneau is still not fully closed, press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.



10. When Step 9 is complete and **Y** has been pressed the PC will calculate the final values based on the auto-configuration procedure you just performed. You will see a screen similar to the one below which shows the old and new ECU values.

Caution:

The following screen is only an example. Actual results will vary vehicle to vehicle.

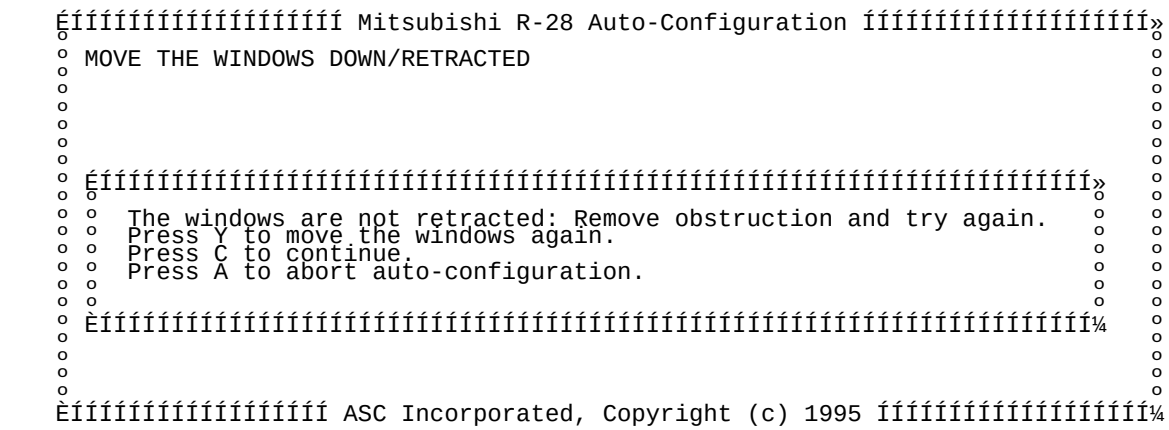


Review the new versus old values. The auto-configuration program has adjusted the parameters to account for service procedures performed and system wear. Any changes to the values in excess of 20 should be questioned and ASC Direct Sales Technical Service Department consulted.

Errors during Auto-configuration

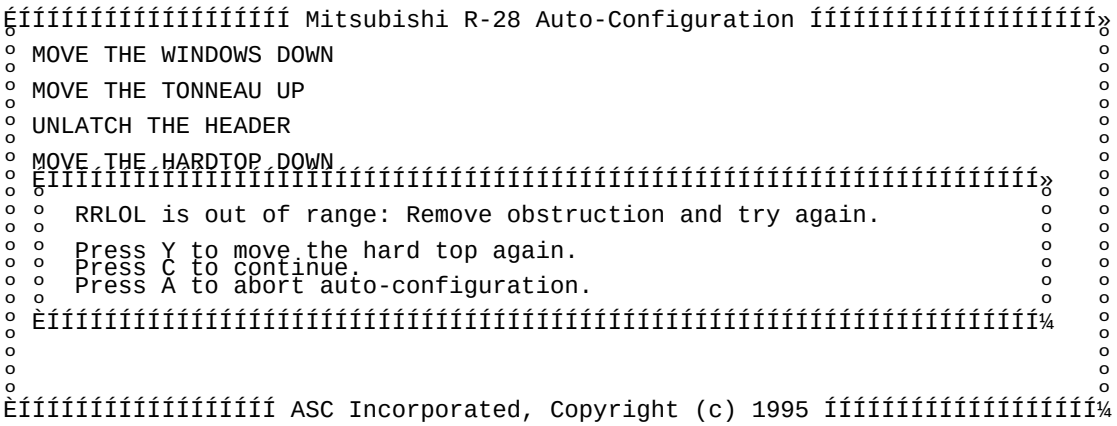
Time-based Error:

If an axis does not reach its end condition before a time-out period elapses the PC will issue an error message. For instance, if the quarter windows run past the time limit, but the PC does not see the quarter window limit switches, you will see the message below. Press **Y** to try to move the axis again. If the second attempt fails press **A** to abort auto-configuration. Diagnose and repair the problem and begin auto-configuration again.



Position-based Error:

If an axis reaches its end limit but the PC finds that its position is not a valid end limit you will see an error message like the one below. Press **Y** to try to move the axis again.



If you continually encounter problems while auto-configuring an ECU, check again to see if there are any DTCs present. If there are DTC's, diagnose and repair the problem and begin auto-configuration again.

If the DTC Log is clear and problems still exist, refer to the SYMPTOM CHART for NO DIAGNOSTIC TROUBLE CODES PRESENT, Diagnostics and Testing in the Service Manual Supplement.

APPENDIX

A. Auto-configuration Software

Compatible computer equipment

The software provided by ASC Incorporated is intended for an IBM® AT (not XT) or compatible and runs under MS-DOS® version 5.0 or later. An 80286 (AT-style) computer or higher (80386, 80486, Pentium, etc.) is recommended. The software is on a 3.5" diskette, in high-density (1.44 MB) format.

The computer must provide a serial communications port, designated as COM1 by the DOS system software. Preferably this port should provide a DB9M connector, as commonly found in PC-AT and-later computers.

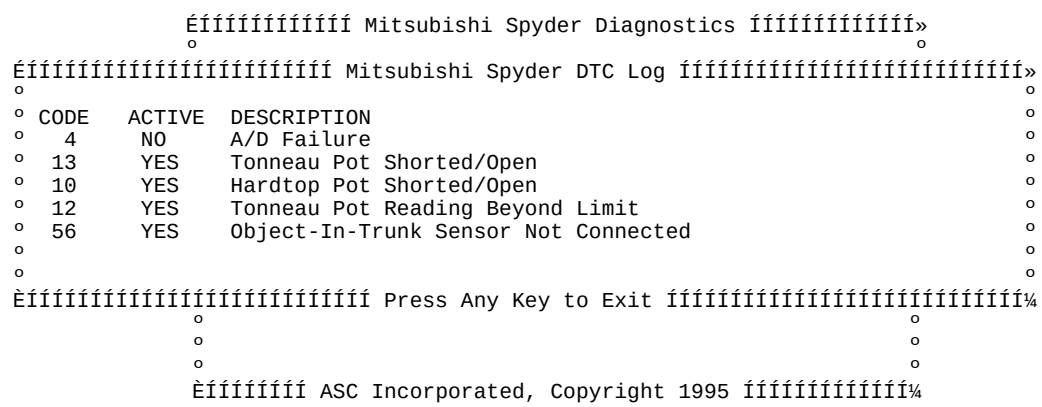
If your computer provides a 25-pin RS-232 serial port connector, it will be necessary to install an adapter with a DB25M plug on one side, and a DB9M plug on the other, to connect the computer to the convertor. This type of adapter is commonly sold to adapt serial mouse devices to 25-pin ports, and should be readily available from retail computer stores.

How to install Auto-configuration software

1. Insert the **AUTO CONFIGURATION** diskette in the floppy drive (drive A:).
2. At the **MS-DOS** prompt **(C:\>)**, type **m d {space} autocnfg {ENTER}** to create a directory for the auto-configuration program.
3. Type **cd {space} \autocnfg {ENTER}** to change to that directory.
4. Type **copy {space} a:*.* {ENTER}** to copy all of the program files from the floppy drive to the hard drive.
5. When all of the files have been copied, put the original floppy diskette in a safe place.

B. Viewing the DTC Log

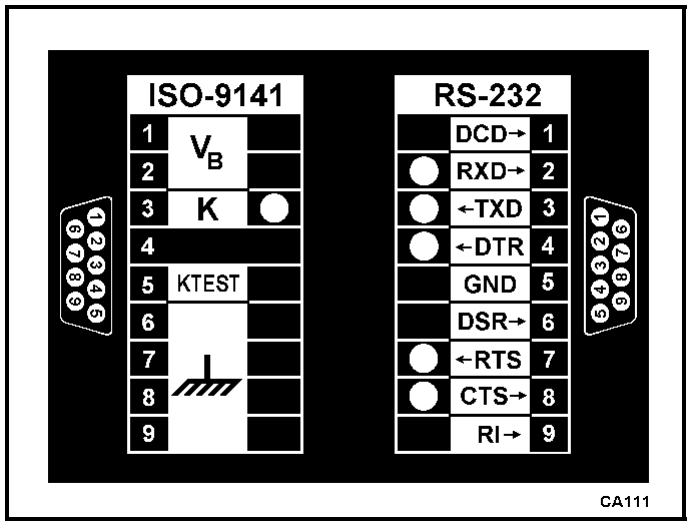
1. Use the up (↑) or down (↓) arrow key to highlight "**View DTC Log**" and press **{ENTER}**.
2. You will see a screen similar to the figure below:



3. If there are active DTC faults (those with **YES** in the **ACTIVE** column), correct these conditions and clear the DTC log before proceeding with auto-configuration. Press any key to return to the **Main Menu**.
4. For complete descriptions of the DTCs, refer to the Service Manual Supplement (Volume 3).

C. About the ISO 9141 Convertor

ISO 9141 CONVERTOR TOP PANEL



1. Two-color lamps

Six LED indicators are visible through the top of the convertor. Each LED can emit green or red light as the convertor is in operation.

LED COLOR	SIGNAL LINE CONDITION
GREEN	HIGH VOLTAGE LEVEL
RED	LOW VOLTAGE LEVEL

2. Signal functions

One LED shows the voltage level on the ISO 9141 K-line.

CONN. PIN	SIGNAL NAME	SIGNAL DIR.	LAMP COLOR	TYP. LEVEL	SIGNAL FUNCTION
3	K	ECU↔PC	GREEN	VBATT	IDLE LINE; LOGIC 1 (MARK); STOP BIT
			RED	0 V	START BIT; LOGIC 0 (SPACE)

Five LEDs show the voltage levels on key RS-232 signal lines.

CONN. PIN	SIGNAL NAME	SIGNAL DIR.	LED COLOR	TYP. LEVEL	SIGNAL FUNCTION
1	DCD	ECU→PC	*(NONE)*	+10 V	DATA CARRIER DETECT, HIGH WHEN POWER IS ON
2	RXD	ECU→PC	GREEN	+10 V	*HIGH SPEED:* START BIT; LOGIC 0 (SPACE)
			RED	-10 V	*HIGH SPEED:* IDLE LINE; LOGIC 1 (MARK); STOP BIT
3	TXD	ECU←PC	GREEN	+10 V	*HIGH SPEED:* START BIT; LOGIC 0 (SPACE)
			RED	-10 V	*HIGH SPEED:* IDLE LINE; LOGIC 1 (MARK); STOP BIT

4	DTR	ECU←PC	GREEN	+10 V	ON = HIGH SPEED DATA MODE
			RED	-10 V	OFF = 5 BAUD SET-UP MODE
5	GND	---	*(NONE)*	0 V	SIGNAL COMMON
6	DSR	ECU→PC	*(NONE)*	+10 V	DATA SET READY, HIGH WHEN POWER IS ON
7	RTS	ECU←PC	RED	-10 V	5 *BAUD:* IDLE LINE; LOGIC 1 (MARK); STOP BIT
			GREEN	+10 V	5 *BAUD:* START BIT; LOGIC 0 (SPACE)
8	CTS	ECU→PC	RED	-10 V	5 *BAUD:* IDLE LINE; LOGIC 1 (MARK); STOP BIT
			GREEN	+10 V	5 *BAUD:* START BIT; LOGIC 0 (SPACE)
9	RI	---	*(NONE)*	0 V	RING INDICATOR, NOT SUPPORTED

3. LED patterns - system idle

ISO 9141 LED				RS-232 LEDs			
LED	**COLOR**	**STATE**	**LEVEL**	**LED**	**COLOR**	**STATE**	**LEVEL**
K	GREEN	IDLE	+VBATT	RXD	RED	IDLE	-10 VDC
				TXD	RED	IDLE	-10 TO -15 VDC
				DTR	RED	OFF	-10 TO -15 VDC
				RTS	RED	IDLE	-10 TO -15 VDC
				CTS	RED	IDLE	-10 VDC

LED PATTERNS - ISO 9141 SYSTEM IDLE

The above LED pattern should appear when the system is idle. The convertor is connected to both the PC and the ECU, and power is on. The ISO 9141 software in the PC is *not* running, so the RS-232 signal lines from the PC are all at idle levels. The RS-232 LEDs are all red, while the ISO 9141 K LED is green.

K LED STEADY RED: If the K LED is red when the system is idle, check the ECU and the cables for a short to ground. The K LED should be green most of the time in any mode. When the system is communicating, the K LED will be green while the ISO 9141 line is idle waiting for a new command, and during logic 1 data bits, stop bits, and interframe idle time. The K LED should go red only for start bits and logic 0 data bits. A steady red K LED indicates a problem on the K line.

4. LED - HIGH SPEED MODE

ISO 9141 LED				RS-232 LEDs			
LED	**COLOR**	**STATE**	**LEVEL**	**LED**	**COLOR**	**STATE**	**LEVEL**
K	GREEN/RED	1/0	HIGH SPEED DATA	RXD	RED/GREEN	1/0	HIGH SPEED DATA
				TXD	RED/GREEN	1/0	HIGH SPEED DATA
				DTR	GREEN	ON	+10 TO +15 VDC
				RTS	RED	IDLE	-10 TO -15 VDC
				CTS	RED	IDLE	-10 VDC

HIGH SPEED LED PATTERNS

During high speed mode, the K LED will be green with short, red flashes.

When the ECU is transmitting high speed data, the RXD LED (data from ECU to PC) will be red with short, green flashes. The TXD line (data from PC to ECU) will be solid red (idle).

When the PC is transmitting high speed data, *both* the RXD and the TXD LEDs will be red with short, green flashes. The convertor echoes the data it receives from the PC on the TXD line, back to the PC on the RXD line.

To connect the ECU to a personal computer, it is necessary to install an ISO 9141 converter, available through ASC. This converts the ISO 9141 signals on the ECU's serial data line into RS-232 (CCITT V.24) voltage levels, for connection to the PC. The converter provides LEDs to indicate the status of selected signal lines. It is necessary to install specialized software into the PC, available through ASC, to handle the RS-232 to ISO 9141 conversion, and to load parameters into the hardtop ECU.

SUPPLEMENTAL INFORMATION

Please keep this in the back of Mitsubishi 3000GT Spyder PC User's Manual.

A. Changing default parameters for the PC or hardtop ECU.

1. Changing Auto-configuration software default parameters in the PC.

(1) The auto-configuration program has an entry screen to change the main operating parameters. To enter this mode, highlight "**Change Default Parameters**" on the auto-configuration **Main Menu** and press **ENTER**. You will see the following screen asking for a password. You will need to call ASC for this password.

```
É͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸ NEW END LIMITS ͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸»
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º     Enter Password: ******                                                   º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
º                                                                              º
È͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸¼
```

(2) After you have entered the correct password, you will see the parameter entry screen:

```
É͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸ NEW END LIMITS ͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸»
º                                                                              º
º  RRLOL End Gap:  2                                                          º
º  RRHIL End Gap:  2                                                          º
º  TOLOL End Gap:  1                                                          º
º  TOHIL End Gap:  4                                                          º
º  RRSLU Gap:      29                                                        º
º                                                                              º
º  RRLOL Minimum:  XXXXXX                                                     º
º  TOLOL Maximum:  160                                                        º
º  TOHIL Minimum:  160                                                        º
º                                                                              º
º  Press Ctrl-ENTER when done entering values.                                º
È͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸͸¼
```

☜ **Screen legends**

RRLOL (Rear Rail* Low Limit) End Gap

The amount added to the measured hardtop low limit to get the final hardtop low limit.

RRHIL (Rear Rail* High Limit) End Gap

The amount added to the measured hardtop high limit to get the final hardtop high limit.

TOLOL (Tonneau Low Limit) End Gap

The amount subtracted from measured tonneau low limit to get the final tonneau low limit.

TOHIL (Tonneau High Limit) End Gap

The amount subtracted from the measured tonneau high limit to get the final tonneau high limit.

RRSLU (Rear Rail* Safety Stop Limit) Gap

The amount subtracted from the hardtop high limit to get the safety stop limit.

RRSGAP (Rear Rail* Stall Gap)

The amount subtracted from the hardtop stall limit to detect stall in the hardtop open and closed position.

TOSGAP (Tonneau Stall Gap)

The amount subtracted from the tonneau stall limit to detect stall in the tonneau open and closed position.

RRLOL (Rear Rail* Low Limit) Minimum/Maximum

The boundaries for a valid hardtop high limit.

RRHIL (Rear Rail* High Limit) Minimum/Maximum

The boundaries for a valid hardtop low limit.

TOLOL (Tonneau Low Limit) Minimum/Maximum

The boundaries for a valid tonneau low limit.

TOHIL (Tonneau High Limit) Minimum/Maximum

The boundaries for a valid tonneau high limit.

*Rear Rail refers to the portion of the Spyder hardtop into which the quarter windows retract.

(3) Use the up (↑) or down (↓) arrow keys to select the parameter that you want to change. Enter a new number and press **{ENTER}**. Press **{Control}-{ENTER}** to save the new values and return to the **Main Menu**.

2. Changing default parameters in the hardtop ECU.

(1) Viewing and modifying the ECU parameters.

Key ECU parameters are stored in tables in the PC computer software, with addresses matching the software in the ECU. These parameters can be directly accessed using labels which start with the symbol #.

The version of the PC software must match the version number of the ECU software. This includes the *MITSXXXX.MAP* file on the PC.

To display a parameter:

To view the current value of an ECU parameter, type # followed by the parameter name. For example, type **#RRHIL {ENTER}** to access the hardtop high limit.

To change a parameter:

1. First the write protect for the section of **RAM** were the parameter you wish to modify resides must be disabled. Refer to the parameter list in Table 1 for the corresponding section of each parameter. For example, the parameter #RRHIL resides in #EESEC2. So type **#EESEC2 {ENTER}**.

2. Now type **5AH**. The write protection for #EESEC2 is now disabled and parameters within this section can be updated.

3. Type # followed by the parameter name. For example, type **#RRHIL {ENTER}**.

4. To change this parameter to a new value, simply type the new value, followed by **W**. For example, to change #RRHIL old value 211 to new value 213 type **213W**. The screen should now show a value of 213 in RRHIL.

To save updated parameters in EEPROM:

1. First program all the parameters in a particular section that you wish to change using the procedures described above.

2. Type # followed by the section name were the parameters you wish to save are located. For example type **#EESEC2 {ENTER}** to update the parameters in EESEC2.

3. Change the value at this location by typing **55H**. The modified parameters will now be automatically stored in the on-board EEPROM.

Table 1

NAME	DESCRIPTION	EE SECTION
#DQSTL	RETRACTABLE STALL CURRENT	#EESEC2
#DQTIL	RETRACTABLE TIME LIMIT	#EESEC2
#DTCLOG	DIAGNOSTIC TROUBLE CODE LOG	#EESEC5
#DWSTL	DRIVER WINDOW STALL CURRENT	#EESEC2
#DWTIL	DRIVER WINDOW TIME LIMIT	#EESEC2
#ENDSTL	END STALL CURRENT TIME	#EESEC2
#MFGDAT	MANUFACTURE DATA	#EESEC4
#PWSTL	PSNGR WINDOW STALL CURRENT	#EESEC2
#PWTIL	PSNGR WINDOW TIME LIMIT	#EESEC2
#RRDVDT	HARD TOP DVDT LIMIT	#EESEC2
#RRHIL	HARD TOP HIGH LEVEL	#EESEC2
#RRLOL	HARD TOP LOW LEVEL	#EESEC2
#RROHL	HARD TOP OVERLAP HIGH LEVEL	#EESEC2
#RROLL	HARD TOP OVERLAP LOW LEVEL	#EESEC2
#RRSLU	HARD TOP SAFETY STOP UP LIMIT	#EESEC2
#RRSTL	HARD TOP STALL CURRENT	#EESEC2
#RRTIL	HARD TOP TIME LIMIT	#EESEC2
#STSTL	START-UP STALL DELAY	#EESEC2
#TODVDT	TONNEAU DVDT LIMIT	#EESEC2
#TOHIL	TONNEAU HIGH LEVEL	#EESEC2
#TOLOL	TONNEAU LOW LEVEL	#EESEC2
#TOOHL	TONNEAU OVERLAP HIGH LEVEL	#EESEC2
#TOOLL	TONNEAU OVERLAP LOW LEVEL	#EESEC2
#TOSTL	TONNEAU STALL CURRENT	#EESEC2
#TOTIL	TONNEAU TIME LIMIT	#EESEC2