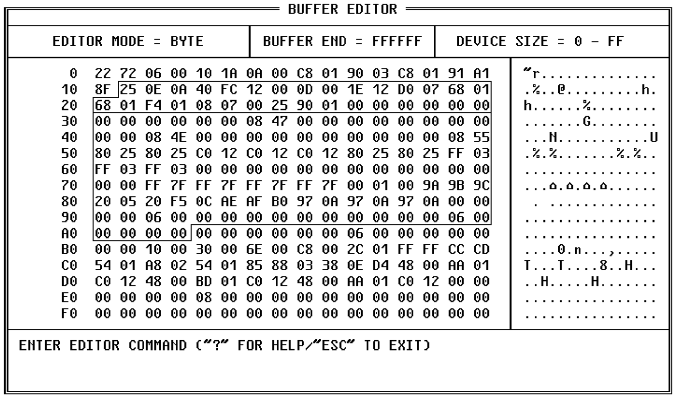
UNDERSTANDING AND USING AIRBAG MODULE TEMPLATES

About airbag modules

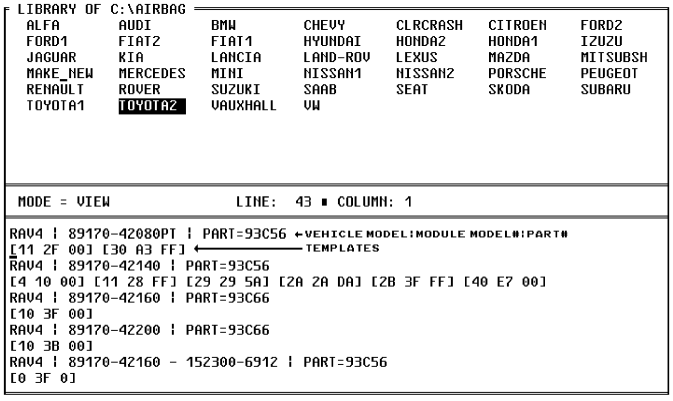
Airbag modules are small, special function computers which constantly monitor vehicle crash sensors plus additional vehicle parameters such as speed, brake pedal position, throttle position plus any other information whch relates to vehicle operation. When a collision occurs, the airbag module computer senses the crash, deploys the airbag(s) and stores information from the sensors in a special type of memory called EEPROM. EEPROM (Electrically Erasable Programmable Read Only Memory) is unique in that it will retain data in its memory array after power has been removed from the circuit. This makes EEPROM excellent for use in applications such as airbag and other body controller modules where programmed parameters must not be lost. EEPROM will be located in one of two physical parts. The most common is a small 8 pin surface mount package. This package (see illustration) holds only the EEPROM. The second location is on the computer chip itself. The computer used in airbag and body controller modules is called a microcontroller. The microcontroller includes all components required to implement a computer including the CPU, program memory, data memory, input/output and EEPROM. Since the EEPROM is located on the same chip as the microcontroller components the EEPROM is accessed by communicating with the microcontroller itself. This is different than communicating with an 8 pin EEPROM which usually requires a simple direct connection to the part. This document describes using the system with 8 pin EEPROM parts however the described concepts apply to microcontrollers as well.

How to clear crash data using templates

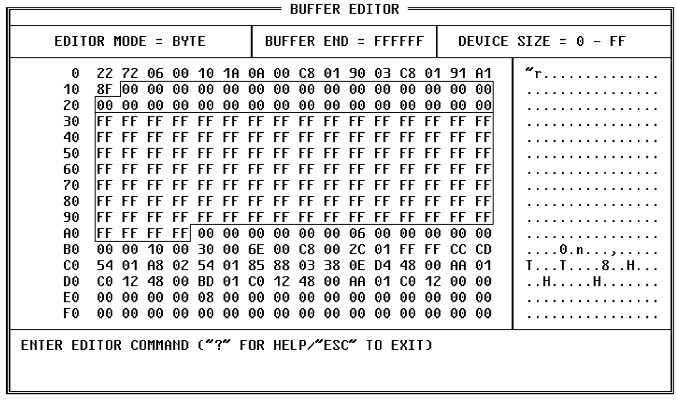
1. Open the airbag module and locate the 8 pin EEPROM. (**NOTE**: If you do not know the EEPROM part number use the system librarian as described in step 2.) Using the system select the part number, configure the programming unit DIP switch and ASERSM1A adapter. Thoroughly clean the EEPROM pins to insure good electrical contact and attach the clip to the part. Press 5 to enter the buffer editor. (**NOTE:** Follow the procedure in the ASERSM1A addendum to insure a good data read.) To read the data from the EEPROM into the buffer press 3 then Y. (See first illustration) The crash data is outlined.



2. Using the Path command (P) hi-lite the AIRBAG directory. Press ALT-L to enter the librarian. (See second illustration) Hi-lite the vehicle manufacturer and press TAB. A cursor will appear. Move the cursor to the line below the vehicle model, airbag module model and memory part number. This is the first template line. Press F6. The system will display the number of templates processed on that line as crash data is removed from the buffer. **NOTE:** If there are multiple template lines move the cursor to each line and press F6.



3. With the clip still attached to the EEPROM press Esc to exit the librarian and return to the COMMAND list. **NOTE:** If you wish to view the cleared crash data (Third illustration) Press 5 (buffer editor). Press 2 then Y. This will program the cleared data from the buffer back into the EEPROM. After programming you should see **"PROGRAMMING COMPLETE" "DATA VERIFICATION IS CORRECT"**. This confirms proper programming of the data into the part. The crash data has now been cleared from the EEPROM itself. Remove the clip. Reassemble the module.



HINTS: If the programming procedure is not successful ("DEVICE DID NOT PROGRAM CORRECTLY") try the following: If the EEPROM is a 95 series part (such as 95080) set the ASERSM1A "VOLTAGE" switch to 5V. If the part is a 25 or 95 series set SW2 on the ASERSM1A DIP switch to ON.

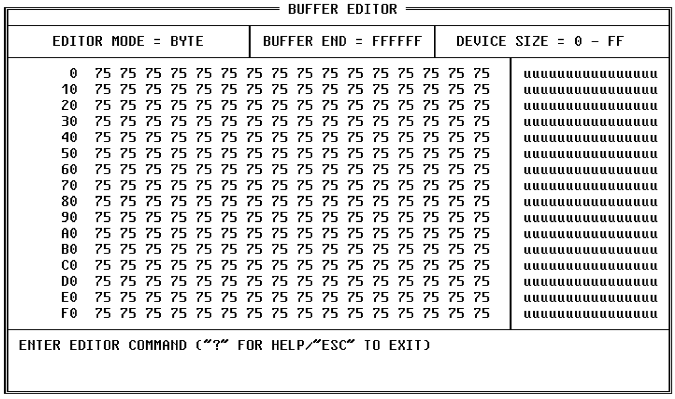
BLOCK PROTECT BITS - The 25 and 95 series parts have bits which can be set to protect areas of the memory array. To clear these bits press Z then R then C. Use the arrow keys and change any 1 bits to 0. Press Esc then W. This will clear any bits that were set. Try programming again.

HOW TO CREATE AIRBAG MODULE TEMPLATES USING A SCRUBBED CRASH DATA FILE

The following procedure describes how to use a scrubbing service to create a new airbag module template. A scrubbing service, such as tachosoftonline.com, is an on-line resource which will remove (scrub) crash data from an airbag module file. The service will charge a modest amount to perform the crash data removal. The service requires that you read the data from the airbag module, save it to a file, and then send the file to the service via email. Once the service receives the file they will scrub the crash data and email the file back to you.

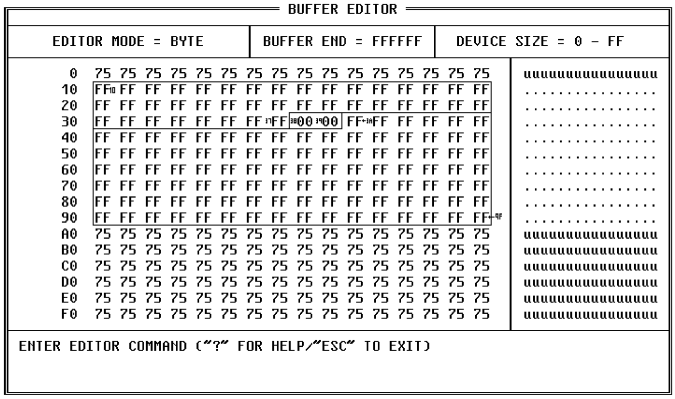
This procedure allows you to send a preformatted file to the scrubbing service and then create a template based on the scrubbed file you receive.

STEP 1 - Open the airbag module and locate the EEPROM which contains the crash data. For this example we will use a 93C56 from a Toyota 4 RUNNER. The module ID number is 89170-35210. Using the system select the 93C56 then press 5 to enter the buffer editor.



STEP 2 - With the buffer editor displayed look at the device size (upper right corner). The 95C56 has a device size of 0-FF. This will change depending on the EEPROM used in the module. You will now create the preformatted file. Press F then 0 FF 75 and press ENTER. The buffer screen will change from FF to 75 (See first illustration).

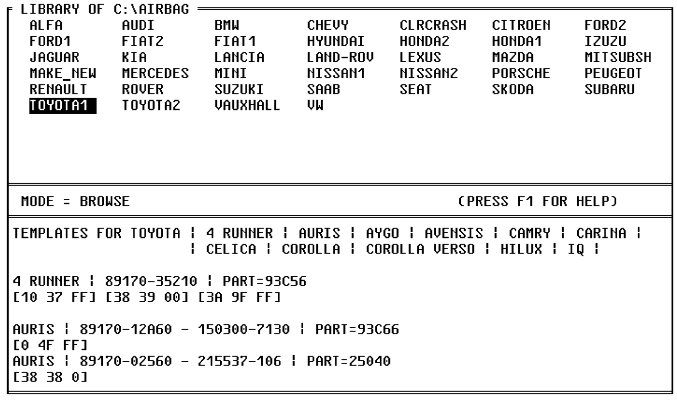
STEP 3 - Press Esc to exit the editor and return to the COMMAND LIST. Press A (Save buffer to disk file) and type a filename (8 characters max) with the extension .BIN (EXAMPLE:AIRBAG1.BIN) and press ENTER. At the ENTER BUFFER STARTING ADDRESS -> type 0 and press ENTER. At the ENTER BUFFER ENDING ADDRESS -> type the second value of the device size and press ENTER. For the 93C56 this is FF. At the SAVE? prompt press Y. This will save the preformatted file in the current path directory.



STEP 4 - Email this file to the scrubbing service and wait for the file to be returned.

STEP 5 - Once the file is returned load the file into the buffer. Press D (directory of files) hi-lite the filename and press F4. Press 5 to enter the buffer editor to view the scrubbed file. Note the areas in the data field which have been changed from 75. In this example there are three areas. (See second illustration) The first area begins at 10 and ends at 37. It is filled with FF. The second area begins at 38 and ends at 39. It is filled with 00. The third area begins at 3A and ends at 9F. This area is filled with FF. You now know which areas compose the crash data fields and the byte value which must be placed in each. Write down or note each address range and the corresponding replacement byte.

STEP 6 - Press Esc to return to the COMMAND LIST. Press L to enter the librarian. You will now create the librarian entry with the new templates. Press ALT-C. At the cursor type TEMPLATES FOR TOYOTA then press ENTER twice. Now type 4 RUNNER | 89170-35210 | PART=93C56 and press ENTER. This is the line which describes the module. (See third illustration as an example) Now create the templates. Type [10 37 FF] [38 39 00] [3A 9F FF] and press ENTER. These three templates correspond to the crash data areas in the returned file. Now press ALT-S to save your work. Type TOYOTA1 and press ENTER. (A filename may be up to 8 characters with no extension). The filename will appear in the upper pane. The new templates are now saved and can be used in the future to clear crash data in any module of the same type.



NOTE: You may organize the information you enter in the librarian any way you choose. The format in this document serves only as an example. The only format restriction is the data format in the templates. Each template must follow this format: [XX<SP>YY<SP>ZZ] where XX is the starting address in the buffer, YY is the ending address in the buffer and ZZ is the data to be placed between the addresses. <SP> is a space (spacebar).