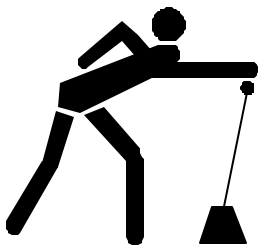


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ShiftMaster Inc.

EEC Tuner User Guide

*Covers board installation and software
installation.*



Parts List

EEC Tuner Circuit Board.

EEC Tuner software diskette.

DC Power Adapter 9V 500 mA tip positive.

EEC Tuner custom RJ45 to 9-Pin modular cable.

Edge Guard strip for early (A9L, A9M) processors.

This instruction document.

**Read the Terms of Use,
Warranty and Liability Waiver
on the last page of this
document before beginning the
EEC Tuner installation!**

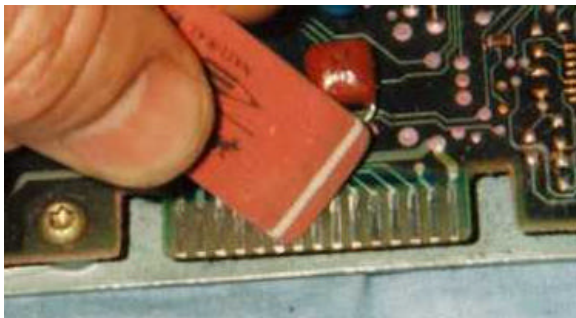


Installation

1. Remove the EEC processor
2. Open the cover
3. Clean the EEC J3 test port connector thoroughly. The J3 connector is covered with white insulating grease from the factory. Save a fingertip's worth of this grease, if it's clean, for later use. Wipe off the excess grease, and then use rubbing alcohol or contact cleaner to remove all traces of grease. The entire EEC circuit board is covered in silicone-like sealer. Usually, this sealer does not cover the J3 terminals. If it does, it must be removed. Use a popsicle stick or a dull screwdriver at steep angle (to avoid cutting into the soft metal terminals) and scrap along the terminals. The sealer will flake off -- it's stubborn but it must be completely removed. After all the sealer and grease is removed, go over the terminals with a pencil eraser (See figure below). Finish off by using rubbing alcohol or contact cleaner on the terminals. The topside terminals (the side with the IC components) are the most important.

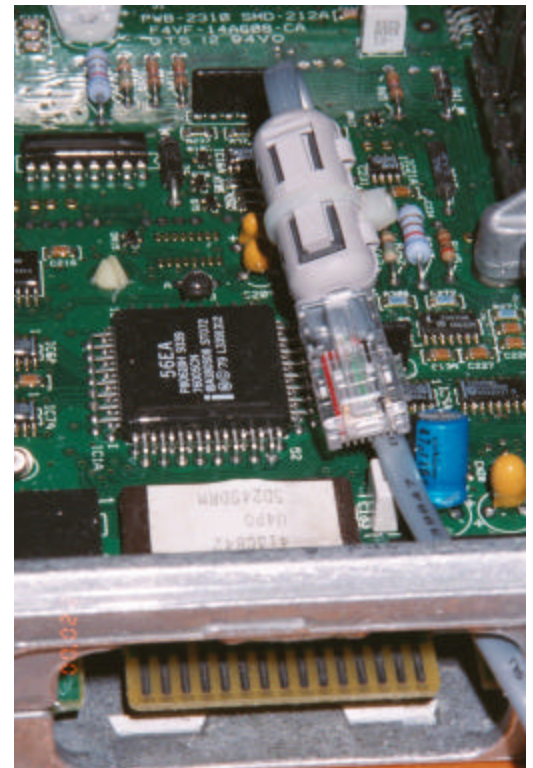
After the terminals are clean, it is recommended that you apply a thin coat of dielectric grease. Reuse the insulating grease you saved, or use the dielectric grease typically supplied with ignition wires.

The thin coat of dielectric grease lubricates and protects contacts. This prevents oxidation, and momentary contact bounce during harsh bumps and vibrations while driving.

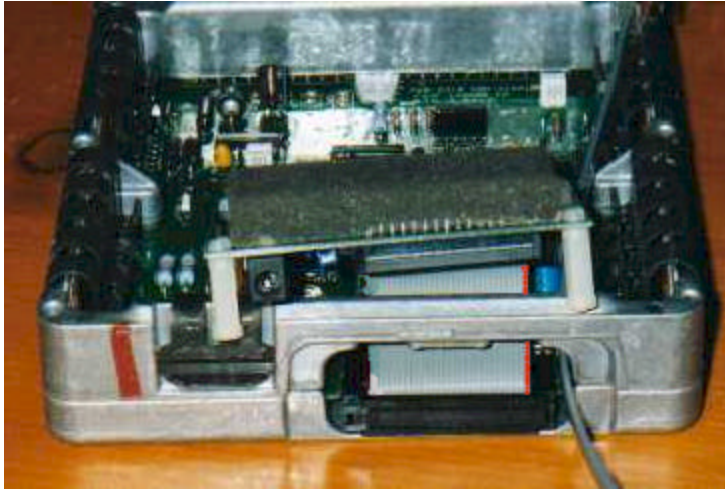


This cleaning procedure is very important! Make sure the J3 connector is absolutely clean! Symptoms of a dirty J3 connector are engine stumbles, operation in Limp-home mode engine strategy, and a continuously running fuel pump with the key on and engine off.

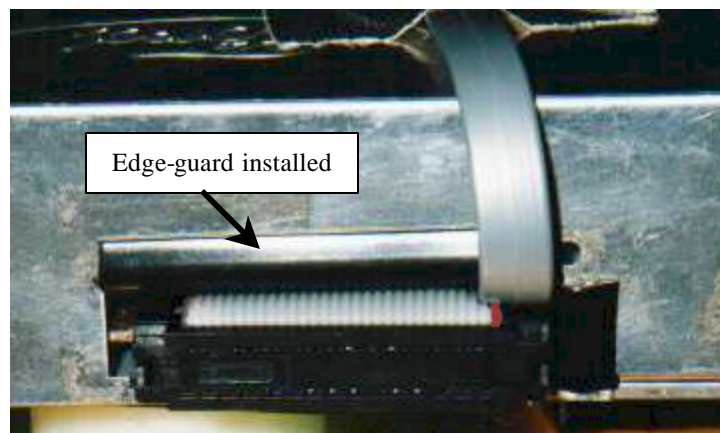
4. Feed the serial cable through the test port opening as shown in the picture to the right.



5. Plug the EEC Tuner into the test port as shown. Pay careful attention to the orientation of the ribbon cable – it is not keyed and can mistakenly be installed upside down. The ribbon cable exits the connector on the top as shown in the picture below. Incorrect installation can damage the EEC Tuner and the EEC-IV processor.



6. Plug the RJ45 connector into the EEC Tuner.
7. Check that there is no metal to metal contact with the EEC Tuner board and the EEC components. If there is any potential interference, carefully bend the EEC component out of the way. Cut the nylon standoffs for better fit if necessary. The circuit board is thick and somewhat immune to bending and flexing.
8. Install edge-guard in test port opening. (Early processors only)



9. Reinstall the EEC cover. You should feel light pressure as the cover compresses the foam glued to the top of the EEC Tuner board. This foam holds the EEC Tuner board nylon standoffs against the EEC circuit board and insulates the EEC Tuner from the metal cover.

10. It is helpful to tape the serial cable to the cover of the processor as shown.



11. Re-install the processor in the vehicle. It may be necessary to cut the plastic processor corner holder from the molded assembly. This is necessary because the EEC Tuner connector extends the length of the processor mounting assembly by about a quarter inch on early EEC-IV processor boxes.
12. Run the cable up along kick panel and mount the 9-pin serial connector under the dash.
13. Connect the 9-pin serial cable from the EEC Tuner to an open 9-pin serial port on your computer.

EEC Tuner software installation

Insert the EEC Tuner floppy disk then run setup.exe.

Follow the on screen instructions to complete the EEC Tuner software installation.

The software is configured to run using COM1. To use another COM port you must edit the file named eectuner.ini found in the directory where the EEC Tuner software is installed. Simply change COM1 to the port you are using (COM2, COM3, COM4, etc.).

```
[EEC Tuner]  
PORT=COM1
```

Basic Guide to operations

The EEC Tuner is a small printed circuit board that hangs off the J3 connector on the Ford EEC-IV processors.

The following processors are supported—There are currently 4 groupings.

A9L 88-93 Mustang
includes A9L, A3M, A3M1, D3D1, X3Z, S0Z

A9M 88-93 Mustang
includes A9M, A9P, C3W, C3W1

ZA0 94-95 Mustang
includes T4M0, U4P0, W4H0, J4J1, ZA0

ALL This tag allows the user to use fixup data for any/all EEC-IV processors without the safety check of verifying the processor ID matches modification table ID.

The EEC Tuner allows the user to perform all of the following in one compact design:

Read the ROM code from any Ford EEC-IV processor. Read ROM banks 8 and 1 on any EEC-V PCM.

Download replacement values for any location in the EEC memory map

The design is general and allows the user to experiment with changing various data locations Ford EEC ROM.

Reading out the Ford ROM

Install the EEC Tuner board in an EEC-IV(V) processor.

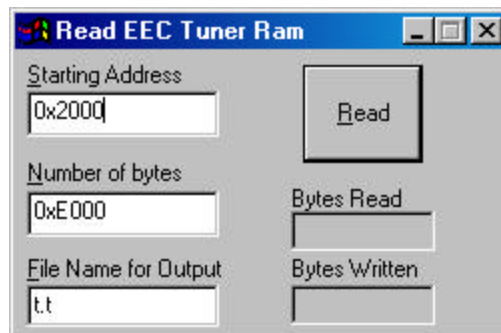
Connect the EEC Tuner serial cable to an open serial port on your computer.

Supply power to the EEC Tuner and PCM by one of the following methods:

- 1) If the PCM is removed from the vehicle, plug the AC/DC adapter into the EEC Tuner power jack and plug the adapter into a wall socket.
- 2) If the PCM is installed in the vehicle, turn the key to the Run position. Don't start the car.

Clear any modifications by downloading ALL followed by END, and power cycle the processor. The file ALL.EEC is provided for this purpose.

Run the EEC Tuner application and Press F5 or select menu items -- EEC Tuner -> Read Ford ROM.



This brings up the dialog box shown above.

Once the dialog box is open press the return key to perform the default action; read in this case. The Ford ROM code is stored in the file entered in the “File Name for Output” field. The image is stored in text format as a series of hex bytes. The raw binary image is always place in file t.bin. To preserve the contents of t.bin you must rename the binary image file “t.bin” before performing another read operation. The text-formatted file, t.t in this case, is automatically opened in the EEC Tuner application as a plain editable text file. You can use the “File->Save As” option if you want to save the file under a different name.

Downloading modifications

Using supported data tags

Start out with the group file matching your processor. Save a copy of these three base files so you don't accidentally change them. Reinstalling the EEC Tuner software will get you fresh copies if you need to.

A9L.eec Grouping for 88-93 Mustangs with any of the following processors A9L, A3M, A3M1, D3D1, X3Z, S0Z

A9M.eec Grouping for 88-93 Mustang with any of the following processors: A9M, A9P, C3W, C3W1

ZA0.eec Grouping for 94-95 Mustangs with any of the following processors: T4M0, U4P0, W4H0, J4J1, ZA0

Cut and paste data items to the top of the file and follow with an END on a line by itself. For example to add 4 degrees of WOT advance and increase your idle to 900 rpms on your A9L equipped vehicle, you would create the following modification file.

```
A9L
WOT_SPARK_ADDER          4
NEUTRAL_IDLE             900
END      # Anything after the END tag is not processed

# Scalars
#####
PIP      961
MAF_VOLTAGE 4.7852
INJ_DELAY  0
GLOBAL_ACCEL_MULTIPLIER 0.39844
ENGINE_DISPLACEMENT     301.08176
.
.
.
```

Once this file has been downloaded to the EEC Tuner via the DOWNLOAD button or menu commands “EEC Tuner->Download Calibration” those modifications become active each time the car is started. The rest of the stock Ford programming is untouched.

You can use the EEC Tuner -> Retrieve Modifications command to read out the modifications from your EEC Tuner and verify it is what you expected. The modifications are read out and stored in a file named current.eec. Use the File->Save As command to preserve the contents of this file under a different name.

Using hexadecimal values on unsupported processors

If you are using a processor not directly supported with data tags and address translations you must use the ALL vehicle ID tag. You can change any data location you want on by providing run-time fixup data in the form HEX_ADDRESS DATA_BYTE like 0x8000 2A would change location 8000 in the EEC-IV rom to a value of 2A. This works on all EEC-IV processors.


```
ALL
0x8000 0x2A
0x8001 0x13
0x8004 0x4A
0x8005 0x44
END
```

Upon powerup, the Ford ROM is copied into EEC Tuner RAM then location 0x8000 is set to a value of 0x2A, 0x8001 is set to a value of 0x13, 0x8004 is set to a value of 0x4A, 0x8005 is set to 0x44.

You can use this hexadecimal format of supplying byte data in supported tagged format downloads. You would do this if you know a data location that is not supported and you still want to change the values.

Tips and Troubleshooting

Always touch a metal ground – like a metal support brace under the dash – so you discharge any static charge before handling static sensitive electronics like the EEC Tuner and your vehicles powertrain control module.

It is normal for the vehicle to take an extra crank or two when the EEC Tuner is installed. The added cranking time should be no longer then 0.25 seconds. To avoid the extra cranking time, turn the key to the run position, wait a second, then start the car normally.

A quick check to see if the EEC Tuner is installed and operating correctly is to turn the key to the run position without starting the car. The EEC Tuner is running correctly when the fuel pump shuts off after a few seconds. If the fuel pump runs continuously, there is a problem with the EEC Tuner board or it was installed incorrectly.

Download the ALL.EEC modification file to test the board with no modifications. Power cycle the vehicle -- Turn ignition key to "Off" then turn to "On", wait one second, then start the vehicle. The ALL.EEC mod file will copy the Ford ROM to EEC Tuner RAM, and run the vehicle using the RAM copy. The vehicle should run exactly like it does with no EEC Tuner connected. If this works, the EEC Tuner hardware is working correctly.

Changing the Idle rpm only is a good way to verify the EEC Tuner operation.

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