

Speeduino – An Open Source Engine Management System

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What Is An Engine Management System?

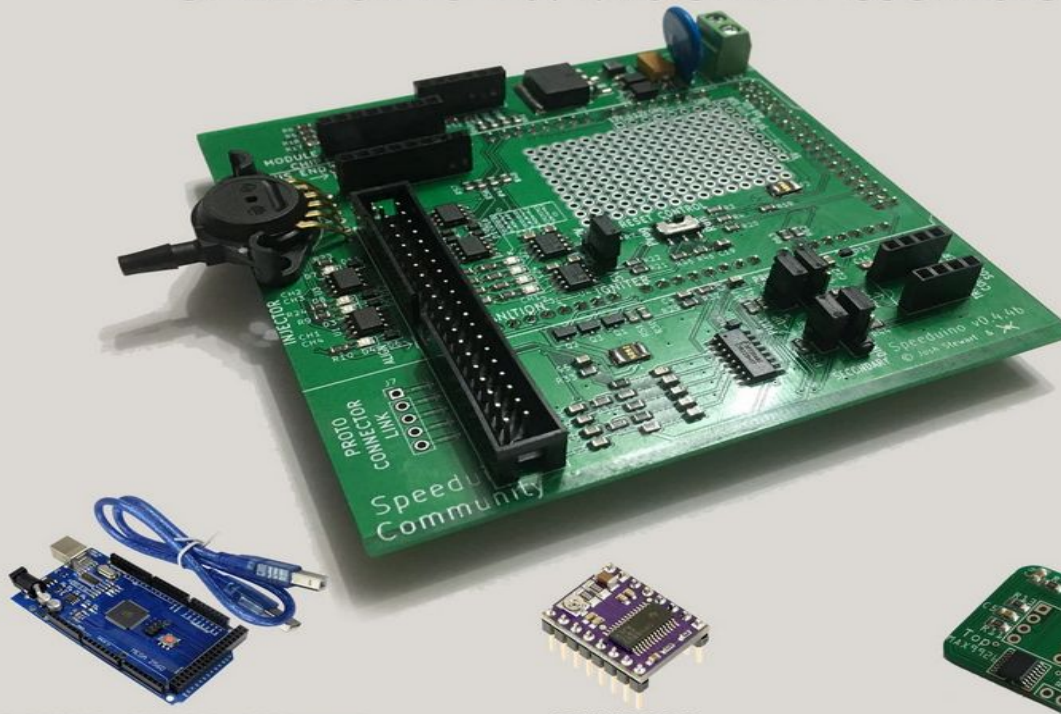
- An engine management system (EMS) is a computer responsible for interpreting data from sensors on your car's modern internal combustion engine, calculating how much fuel is required and outputting fuel and spark at the correct time.
- An EMS also protects the engine from some forms of catastrophic failure by alerting the driver of an issue and either forcing the engine into a limp mode or in some cases shutting down the the engine all together.



What is Speeduino?

- Speeduino is a tuneable open source EMS that can be adapted to just about any engine with up to 8 cylinders.
- It was developed by Josh Stewart, an automotive enthusiast who also has a passion for open source. The project was born with a philosophy of being built on by a community for the community and providing a low cost solution for EMS.
- Speeduino is available as an out of box solution, however you can design and build a DIY board as the schematics are available.
- Speeduino is powered by either an Arduino or Teensy Microcontroller.
- Speeduino has been successfully installed in over 1000 different cars around the world.

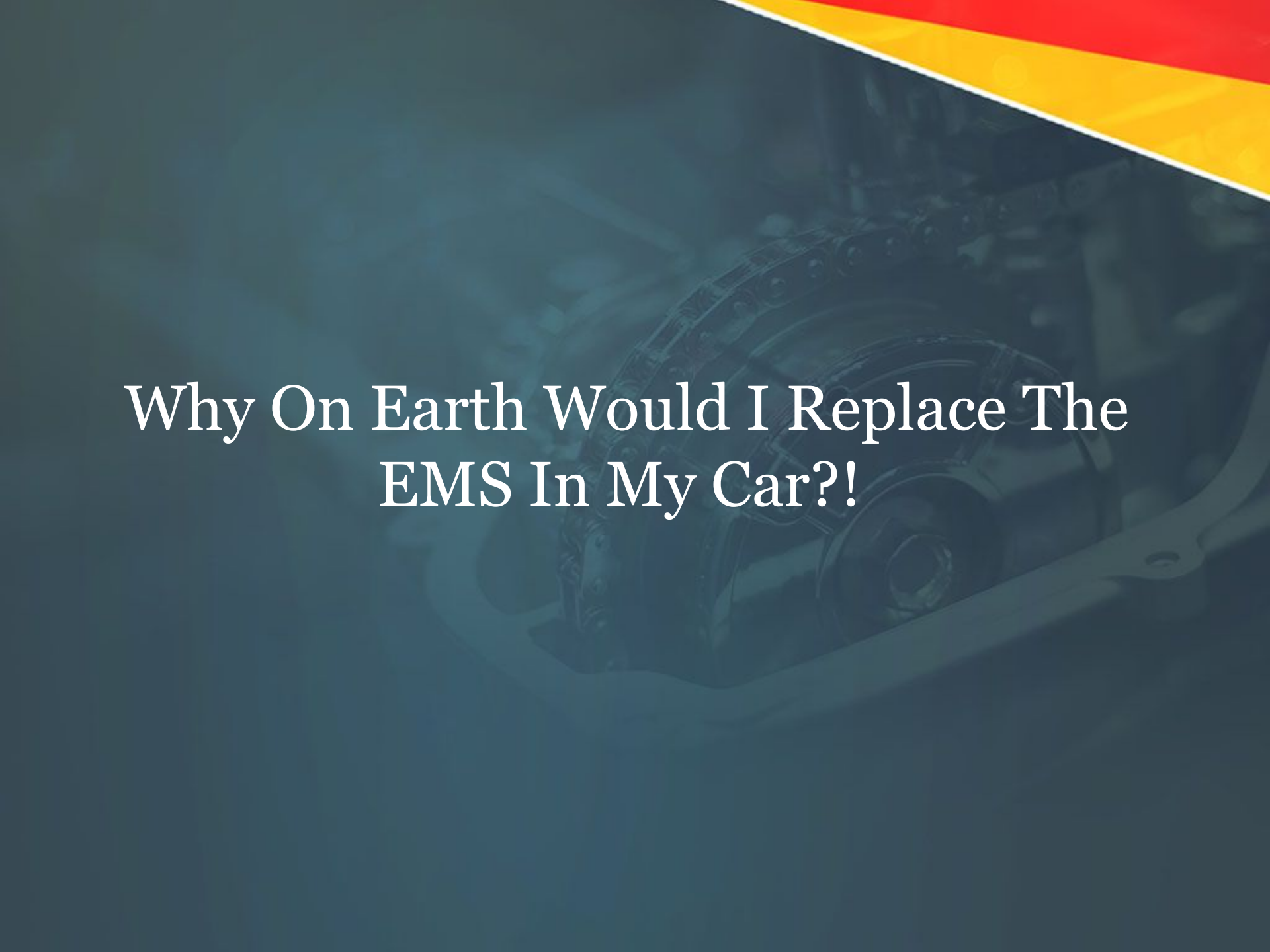
SPEEDUINO v0.4.4b SMD Assembled



ARDUINO MEGA (CH340)

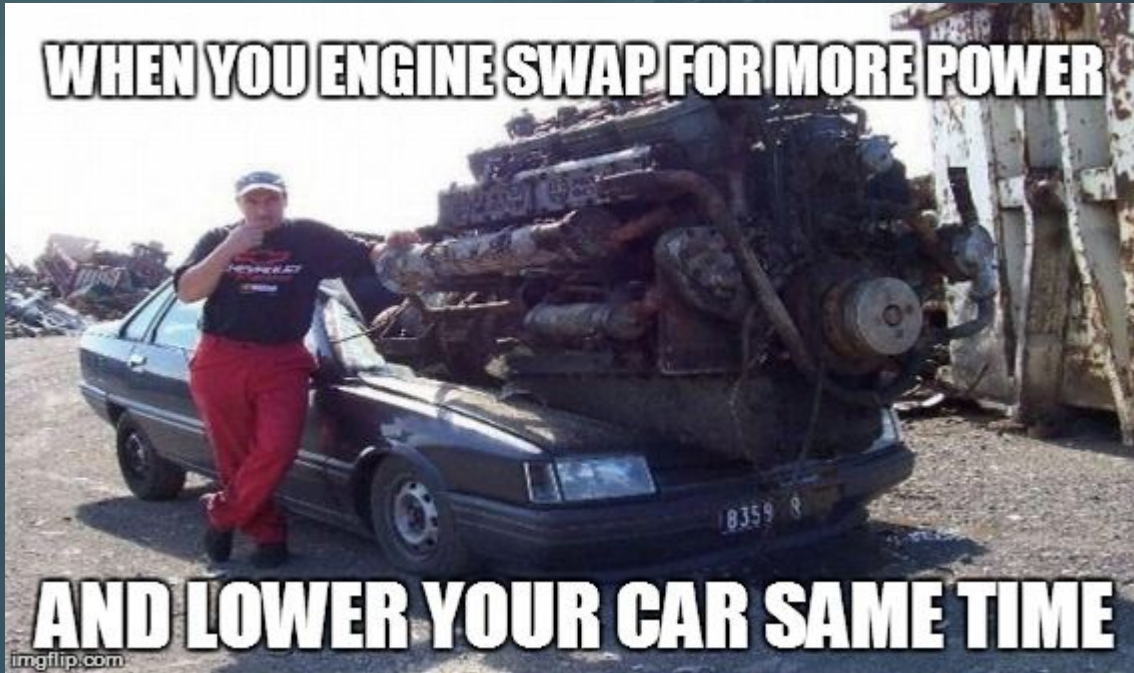
DRV8825

Speeduino v3
DUAL VR CONDITIONER
MAX9926



Why On Earth Would I Replace The
EMS In My Car?!

WHEN YOU ENGINE SWAP FOR MORE POWER



AND LOWER YOUR CAR SAME TIME

imgflip.com

The Factory EMS

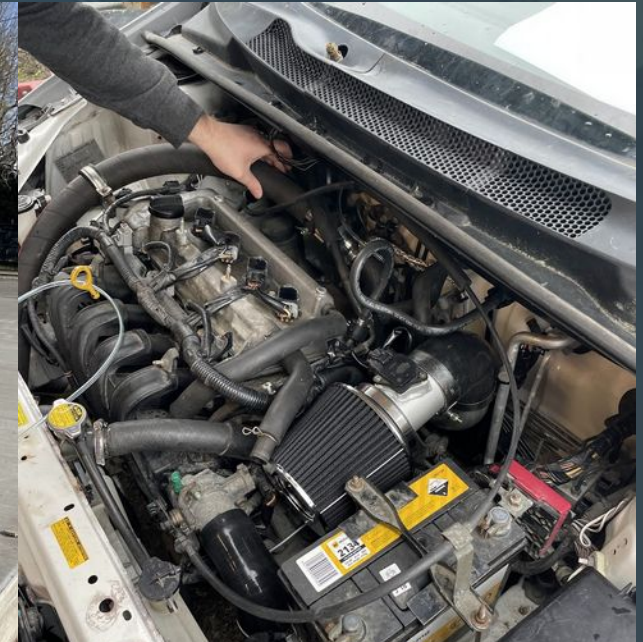
- The factory EMS in your car only knows how to control the engine the car comes with.
- The EMS will not be able to run the car correctly if the engine has been modified to add/remove more fuel, air or spark.
- Many factory EMS are not reflashable and if they are, are very limited in what you can do with them.
- Failure to reflash or swap out the EMS for a tuneable one could result in inefficient operation or catastrophic failure.

So Why Speeduino, There Must Be Other Options?

- There are dozens of companies out there who provide **proprietary** EMS solutions such as Link and Haltech (both very popular here in New Zealand). Speeduino is open source and the community is great.
- Cost – Speeduino only costs about \$300 NZD for a prepopulated board vs \$1800 for a Link ECU with similar features.
- Speeduino can be adapted for any setup in any car. If a feature from the EMS is missing for your particular setup, you can build a custom fork of the firmware and enable any additional hardware via the additional inputs/outputs available on the board.
- Speeduino benefits from regular feature and firmware updates (every couple of months). Many other solutions will force you to purchase a new EMS in order to benefit from new features.

My Racecar

- Inherited from my Grandfather a couple of years ago.
- 2003 Toyota Echo - 1.3L Manual
- Modified fuel system – larger fuel injectors
- Intercooled Turbocharger added to standard engine
- Various suspension modifications
- Very sticky tyres for the race track.
- Weighs about 850KG



TunerStudio Software

- Developed by EFI Analytics.
- Free and available on Win/OSX/Linux
- Paywall for advanced features – Auto tune, advanced logging.

Resources

- <https://speeduino.com/home/>
- <https://www.tunerstudio.com/>
- <https://github.com/noisymime/speeduino>

Feel free to contact me if you have more questions!

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Discord server.