

MILLER PERFORMANCE



M20|M30 Turbo Tuning Package Instruction Manual

Miller Performance Ltd.
Tel 855 BMW TUNER

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Limited Lifetime Warranty

Miller Performance Ltd. warrants that products manufactured by Miller Performance Ltd will be free from defects in materials and workmanship for the life that you own your vehicle. If any such product proves defective with the exception of electronic components during the applicable warranty period, Miller Performance Ltd., at its option, either will repair the defective product with charge for parts and labor or will provide a replacement in exchange for the defective product. **Items not manufactured by Miller Performance Ltd. or electronic devices have a limited warranty of 30 days past date of shipment.**

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1. General Information

1.1 Introduction

The Miller Performance tuning packages have been carefully developed to provide optimum performance without compromising dependability. We have always used a factory correct formula in the development of Miller Performance products and custom built ground up super cars.

This tuning package is engineered to upgrade your M20 or M30 engine to a more capable style of air flow sensor and tune providing the ultimate control of your turbo project. The performance of this application may be altered if you have done or will do other modifications to your car. You can contact our technical department if you have any questions regarding other modifications before installing this kit.

1.2 Tuning Package Description

The M20 and M30 Tuning Package features the following:

- 600+ HP capable Miller MAF
- 100% plug and play design
- Draw Through configuration
- Stock ECU Retention
- Flawless stock like drivability
- End user adjustability
- Multiple tunes on one device

1.3 Parts Included (Standard System Contents)

Part Number	Description	Quantity
MP-MAF-0099	Miller MAF Sensor	1
MP-WAR-1000	Miller W.A.R. Chip	1
MP-INJ-SD42	42 Lb/hr Injectors	6
**MP-VCLC1	Optional Variable closed loop control system	1

1.4 Tools Required

The following tools and supplies (not included) or similar tools and supplies are required for fast and proper installation of this Miller Performance product:

- Flathead Screwdriver
- Philips Screwdriver
- 10mm socket wrench
- Wire strippers
- Alan Key set

1.5 Safety and Precautions

	Warning: Ensure vehicle cannot roll when working on the vehicle
	Warning: Disconnect the ground strap (negative) whenever doing work on electrical or fuel systems.
	Warning: Never run the engine unless the work area is well ventilated. Carbon monoxide kills!
	Caution: Before starting each procedure, ensure that you have all the necessary tools and parts on hand. Read all instructions thoroughly; do not attempt shortcuts use only parts and materials that are included in this kit or approved by Miller Performance.
	Caution: Be careful when using soldering iron. Temperatures can be in excess of 400 degrees and burns can be serious.

2. System Installation

2.1 Introduction

The following section provides information that **MUST** be read and understood before proceeding with the installation of your Miller Performance Turbo tuning package. The information included in this section is considered basic essential information and may not include any or all possible complications you may experience during the installation of this system.

Limit the number of distractions while installing this kit. Pay close and careful attention to the instructions and information provided in this manual during the installation. Damage to your vehicle and/or personal injury may result due to lack of attention.

2.2 Battery Disconnect



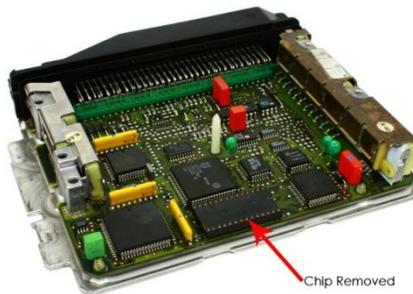
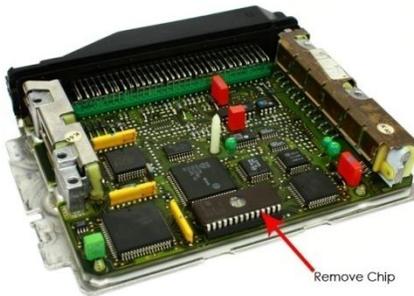
Figure 1
Disconnect the Negative terminal on the battery.

2.3 W.A.R. Chip Installation

This section will guide you through the process of accessing your ECU to install the W.A.R. Chip and modify a couple wires for your MAF. For more details refer to the W.A.R. Chip Specific Manual online.

1. A) For e34s open the hood and access the ECU in the E-box on the passenger side of the engine bay (Upper Side). Using a Philips screwdriver undo the four screws.

B) For E30s open the glove box and above a false ceiling you will find your ECU mounted by four 10mm fasteners.
2. Unplug and remove the ECU from its compartment.
3. Open the ECU. There are tabs around the bottom of the cover. As well your ECU may have 4 torx bolts to undo on the top side of the ECU. Remove the Chip in the ECU and replace it with the W.A.R. Chip.



2. 4 MAF Install

This section will guide you through the process of accessing your ECU harness to modify two ECU wires.

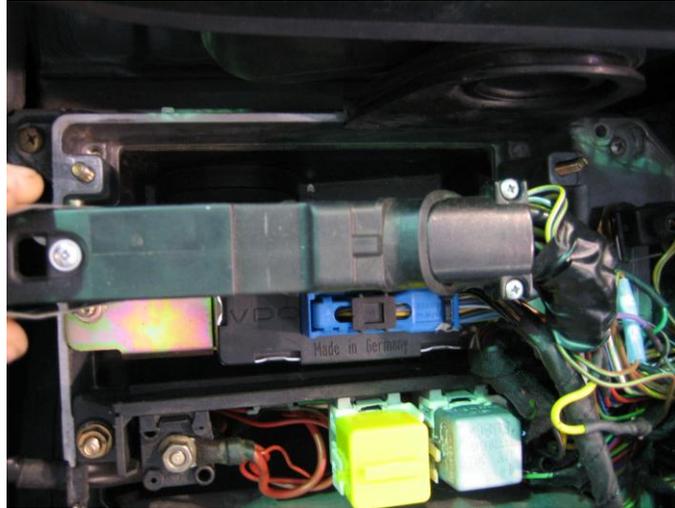


Figure 2

1. Use a small Philips to remove the three small screws on the back to the ECU plug connector.
2. After the removal of the three screws, carefully pry, with a flat screw driver, the black backing, back and off the ECU plug. Don't lose the rubber ring around the ECU plug.
3. Once you have successfully removed the harness from its black casing you should end up with something like this

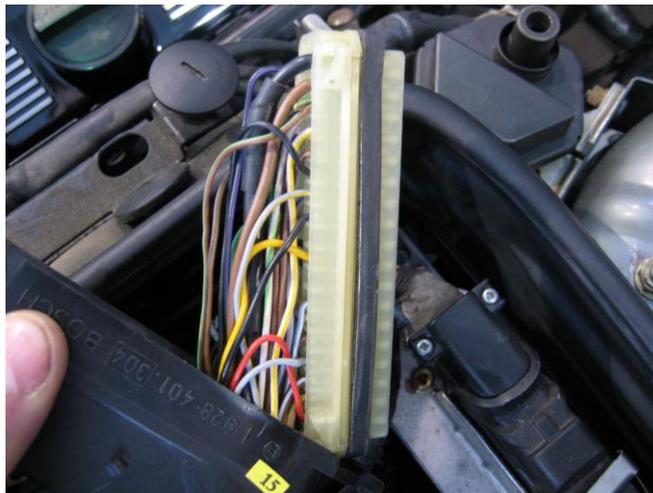


Figure 3

4. Once you have the cover pulled back you are now ready to re-route a few wires.

2. 5 ECU Retrofit (Acquiring 12v Signal)

Don't be intimidated by this procedure. It involves two wires and a small bit of soldering. Be sure to read and completely understand this section. It is very important to find the correct wires and pin locations. Otherwise your vehicle could run poorly or not at all.

READ THIS SECTION SLOWLY AND CAREFULLY!

1. Locate the following pins (make note of which color each pin is):
 - a. Pin 37 (Red/Blue)
 - b. Pin 12 (Grey/White)
2. Take the **Grey/White** wire and cut near the connector. Take the **Grey/White** wire and create a 'T' soldering it into the wire coming out of pin 37. The below picture illustrates this step. *Note, your Tee'ing the portion of pin 12 that leads to the engine bay.*



Figure 4

3. After the solder is cool, lightly pull on the connection to ensure it is going to hold up. Using some electrical tape or shrink tube, cover the new connection tightly.
4. You can now put the ECU plug back together. Remember to screw the three small Philips screws back in.
5. Extend the wires for the MAF sensor connector to reach the passenger side headlight area. This is required as the MAF must be used in DRAW THROUGH.

2.6 Variable Closed Loop Control (Highly recommended)

If you opted to use the Miller Variable Closed Loop Control system, you will need to set up the included wideband gauge and WAR Chip properly for the VCLC to function properly. The benefits of the VCLC system are incredibly stable and consistent air fuel ratios under boost regardless of temperature boost level, methanol use etc. The VCLC system uses the power for the factory ECU to constantly monitor and maintain a target air fuel ratio in boost. The factory ECU and control algorithms do not offer this and one can only achieve these results with the VCLC!

1. Refer to the AEM Failsafe Wideband manual for generic installation of power and ground etc.
2. Refer to the diagram on the next page to integrate the VCLC system features:
 - a. Cut the TCM knob off of the loom.
 - b. Take the BLUE wire from the AEM gauge and connect it into the RED wire on the WAR Chip Tune control module loom.
 - c. Take the brown AEM wire and ground it to any suitable ground wire or chassis ground.

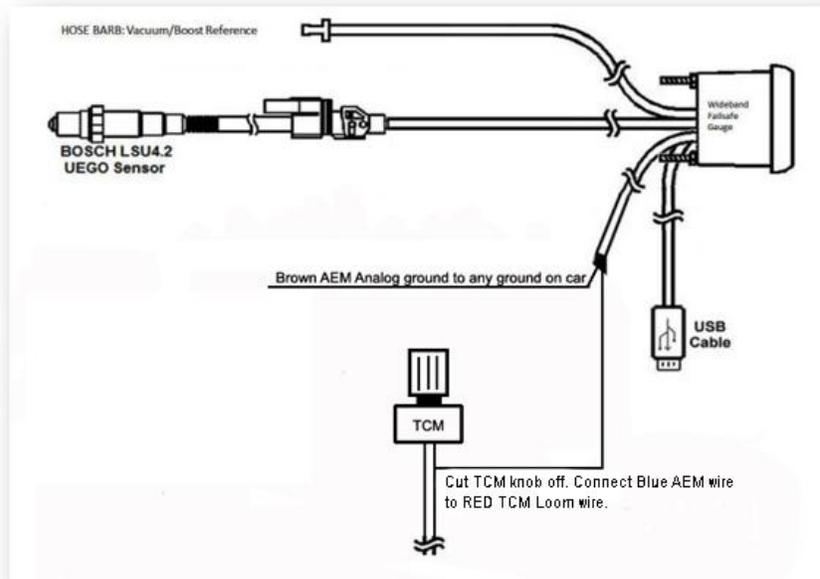


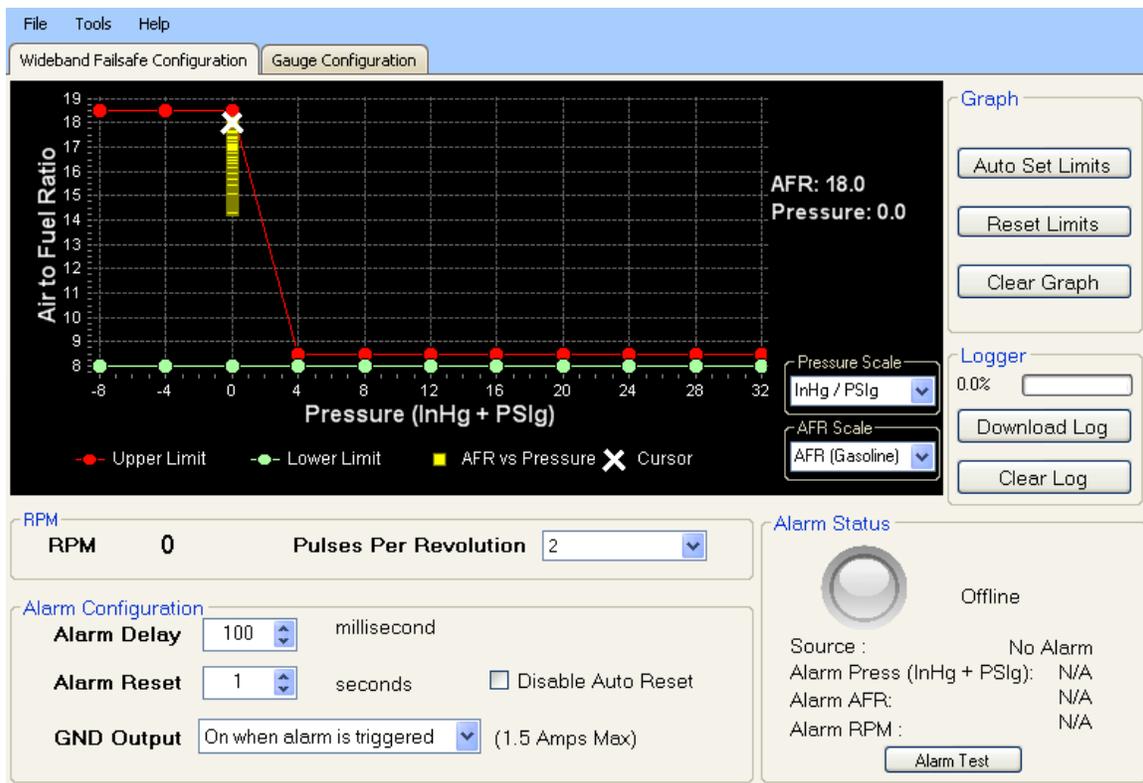
Figure 5

When you set up the WAR Chip, you must place the tunes in the following position:

- Tune 1: Base tune with desired BOOST AFR active
- Tune 2: Base tune with desired BOOST AFR active
- Tune 3: Base tune with desired BOOST AFR active
- Default: Base tune with normal 14.7 AFR active

2.6 VCLC Configuration

To set the trigger for the wideband AFR target switch, plug the AEM gauge into your computer and run the AEM communication software. Configure your gauge to match the picture below.



2.7 Injector Installation

Installing your injectors is quite easy. Make sure you are working in an environment without open flames. This should be obvious – but trust us, you'd be surprised...

In this section we will offer some tips on the replacement process.

- 1) Unbolt the plastic injector harness.
- 2) Unbolt the fuel rail and gently remove the injectors from their ports as an entire unit.
- 3) Now you should have the fuel rail with injectors still attached loose and free to move around slightly. Carefully remove the first injector by releasing the retainer. Use a rag to shield where the injector meets the fuel rail. The rail is pressurized so the rag will catch the fuel from the first injector.
- 4) Now that the pressure and first injector has been relieved you can remove the other 5.
- 5) Clean the injector mating surface and install new injectors into the rail.
- 6) Reassemble the fuel rail and wiring assembly.

For more detailed instructions please visit this great link:

<http://www.pelicanparts.com/BMW/techarticles/E36-Injector-Replacement/E36-Injector-Replacement.htm>

3. Drive your Vehicle

3.1 Initial Start up

Remember to connect your battery before you reassemble and start your vehicle. Once you have connected the battery you will be ready to test your newly installed items.

****Note: This is a base tune. For the sake of your wallet, use caution when boosting. We recommend setting your boost level around 8 to 10 PSI to start for “checking” purposes. Call us if you have any strange issues or concerns immediately.**

DO NOT BAG ON THE CAR until you have verified the tune at a dyno.

Your car should run well on the base tune out of boost. Once you are ready to dial in your tune, call and make an appointment with us so that we can tune you over email while at the dyno. After the tune is confirmed and we are happy with the power and AFR, go have some fun your car should haul!

3.2 Troubleshooting

If your car hasn't smoothed out after a 10 minutes of driving you may need to check some things.

1. Ensure MAF is plugged in correctly IN FRONT of the turbo.
2. Ensure you have no boost leaks. Blow off valves to Atmosphere are not supported.
3. Ensure you are using the correct base tune.
4. Ensure your injectors all plugged into the injector harness securely.

If you cannot resolve the problem please phone us and we will help walk you through a solution. You can reach us at our normal toll free number, 855 269 8863 or email info@millerperformancecars.com