

MILLER PERFORMANCE



E30/E34 M20 Mass Air Flow Conversion System Instruction Manual

**Miller Performance Ltd.
Tel 855.BMW.TUNER
2009 Abbotsford Way, Abbotsford BC, V2S 6Y5
Millerperformancecars.com**

Table of Contents:

1. General Information.....	4
1.1 Introduction.....	4
1.2 MAF System Description	4
1.3 Parts Included (System Contents).....	4
1.4 Tools Required.....	5
1.5 Safety and Precautions.....	5
2. System Installation.....	6
2.1 Introduction.....	6
2.2 Battery Disconnect.....	6
2.3 ECU and Chip Modifications.....	7
2. ECU Retrofit (Adapting to Miller MAF requirements).....	9
2.5 Chip Removal/installation	10
2.6.1 AFM to MAF Replacement	11
2.7 Reassembly	11
3. Drive your Vehicle.....	12
3.1 Initial Start up	13
3.2 Troubleshooting	13

Limited Lifetime Warranty

Miller Performance Ltd. warrants that NON ELECTRONIC 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 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. **NON ELECTRONIC items not manufactured by Miller Performance Ltd. Have a limited warranty of 30 days past the date of purchase.**

In order to obtain service under this warranty, the customer must notify Miller Performance Ltd. of the defect before the expiration of the warranty period and make suitable arrangements for the performance of service. In all cases the customer will be responsible for packaging and shipping the defective product back to the service center specified by Miller Performance Ltd., with shipping charges prepaid. Miller Performance Ltd. shall pay for the return of the product to the customer if the shipment is within North America, otherwise the customer shall be responsible for all shipping charges, insurance, duties and taxes, if the product is returned to any other location.

This warranty shall not apply to any defect, failure or damage caused by improper use or failure to observe proper operating procedures per the product specification or operators manual or improper or inadequate maintenance and care. Miller Performance Ltd. shall not be obligated to furnish service under this warranty 1) to repair damage resulting from attempts by personnel other than Miller Performance Ltd's. representatives to repair or service the product; 2) to repair damage resulting from improper use or connection to incompatible equipment; 3) to repair damage resulting from operation outside of the operating or environmental specifications of the product.

MILLER PERFORMANCE LTD. LIABILITY FOR THE MERCHANTABILITY AND USE OF THE PRODUCT IS EXPRESSLY LIMITED TO ITS WARRANTY SET OUT ABOVE. THIS DISCLAIMER AND LIMITED WARRANTY IS EXPRESSLY IN LIEU OF ANY AND ALL REPRESENTATIONS AND WARRANTIES EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR PARTICULAR PURPOSE, WHETHER ARISING FROM STATUTE, COMMON LAW, CUSTOM OR OTHERWISE. THE REMEDY SET FORTH IN THIS DISCLAIMER AND LIMITED WARRANTY SHALL BE THE EXCLUSIVE REMEDIES AVAILABLE TO ANY PERSON. MILLER PERFORMANCE LTD. SHALL NOT BE LIABLE FOR ANY SPECIAL, DIRECT, INDIRECT, INCIDENTAL OR CONSEQUENTIAL DAMAGES RESULTING FROM THE USE OF THIS PRODUCT OR CAUSED BY THE DEFECT, FAILURE OR MALFUNCTION OF THIS PRODUCT, NOR ANY OTHER LOSSES OR INJURIES, WHETHER A CLAIM FOR SUCH DAMAGES, LOSSES OR INJURIES IS BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, OR OTHERWISE. BY ACCEPTING DELIVERY OF THIS PRODUCT, THE PURCHASER EXPRESSLY WAIVES ALL OTHER SUCH POSSIBLE WARRANTIES, LIABILITIES AND REMEDIES. MILLER PERFORMANCE LTD. AND PURCHASER EXPRESSLY AGREE THAT THE SALE HEREUNDER IS FOR COMMERCIAL OR INDUSTRIAL USE ONLY AND NOT FOR CONSUMER USES AS DEFINED BY THE MAGNUSON-MOSS WARRANTY ACT OR SIMILAR STATE CONSUMER WARRANTY STATUTE

1. General Information

1.1 Introduction

The Miller Performance MAF System™ has 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 MAF System is engineered to upgrade a stock M20 2.5L engine to a more modern style of air flow sensor. 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 MAF System Description

The Miller Performance MAF system™ features the following:

- 2.7" OR 3.0" MAF Housing
- Stock Mountable Design
- Excellent flow rating
- Fast install time

1.3 Parts Included (Standard System Contents)






Part Number	Description	Quantity
MPC-AMH-0010	Miller MAF with housing	1
MPC-SFT-20XX	Miller Performance Chip	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 MAF System™:

- Flathead Screwdriver
- Philips Screwdriver
- 10mm socket wrench
- Wire strippers
- Solder
- Soldering iron
- Shrink tube
- Electrical tape
- Heat gun (to shrink 'shrink tube')

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 MAF System™. 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 ECU and Chip Modifications

This section will guide you through the process of accessing your ECU to change the Chip and modify some ECU wires.

1. For e34 525's 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.

For E30's open the glove box and remove plastic cover to expose the ECU located on the top of the glove box compartment.

2. Now the ECU will be exposed. Using a 10mm socket wrench, undo the two 10mm nuts.
3. Unplug the ECU from its connector harness.

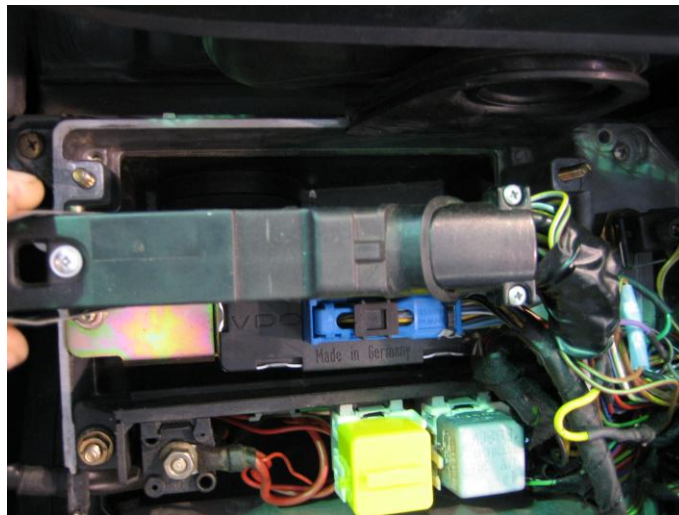


Figure 2

4. Use a small Philips to remove the three small screws on the back to the ECU plug connector.
5. 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 loose the rubber ring around the ECU plug.

6. Once you have successfully removed the harness from its black casing you should end up with something like this



Figure 3

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

2. 4 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.

2.5 Chip Removal/installation

The Chip contains the software required for your vehicle to operate. Avoid high static areas. Also avoid dropping the chip and spilling liquids on it.

You need to take the metal case off of the ECU. There are tabs all the way around the bottom side. Using a small flat screwdriver gently lift up the tabs to release the ECU. Be careful not to bend the tabs too far as they may break.

Once you have the ECU open and the chip side exposed you are ready to replace your current chip.

Carefully pry evenly on each side of the chip back and forth until it is free from its holder.

Take the chip that came with your MAF System and install it in place of the original one. Make sure that you align the small notch (half circle) on the chip, to the small notch on the ECU, this will insure your chip is installed properly. Make sure the chip provided is matched to the last three numbers of your ECU, ending in 153, 173, 380 or 525.



Figure 5

You have successfully completed all steps required for the ECU. You can now reassemble the ECU and glove box or E-box

2.6 AFM to MAF Replacement

In this section you will be working in the engine bay. You will undo the Air Box clamps. Also undo the hose clamp on the engine side of the Air Flow Meter.

1. On the bottom of the Air Flow Meter (AFM) remove the three clips holding it in place.
2. Loosen the hose clamps on both sides of the AFM.
3. Unplug the AFM connector and remove the AFM from the car.
4. Remove the intake boot from the throttle body.
5. To install the MAF housing you will need to stretch your intake boot over our sensor housing detailed in the next section.

2.7 Reassembly

You will need to stretch the stock intake boot over the MAF housing. The stock boot size is smaller than 3" but can easily be stretched if you follow this section.

1. Ensure your intake boot is not dry and brittle. We sell new intake boots for this very reason. In order to successfully stretch the boot, it will need to be in top condition.
2. Get a large enough pot to fit the intake boot and boil some water on the stove. Stand the portion of the boot you will need to stretch in the boiling water for 1 to 3 minutes.



Figure 6

3. After 1 to 3 minutes, the boot will be soft enough to safely stretch it over the MAF. **BE CAREFUL THE BOOT WILL BE HOT AND MAY RETAIN SOME BOILING WATER INSIDE THE RIBBING. ENSURE YOUR SAFETY TO AVOID BURNING YOUR HANDS.**
4. Stretch the boot over the housing tube. You MAY need to use a screwdriver to assist by prying, however, this should require minimal effort with the soft rubber.
5. Secure the boot to the housing with a hose clamp and allow the boot to cool. The boot will slightly form to this new shape. However, rubber does have a memory and may want to return to the original size IF you let it cool without being on the tube. In the future, there will be enough stretch that you shouldn't have to boil it again if you need to remove and reinstall it.

The image below shows that both M20 intake boot types can be stretched to fit the MAF housing. Do not confuse this with your car missing an additional boot.



You can now install the MAF Housing and intake boot assembly back into the car and wrap up your installation.

Check to make sure air boots are tightly secured on to the MAF.

There is a “keyway” in the middle of the Miller MAF plug. Make sure that lines up with the keyway on the BMW harness plug. Plugging in upside down will void warranty.

Make sure you have not installed the MAF sensor backwards in terms of air flow direction. There is an arrow on the top of the sensor that point in the direction of travel for the air flow.

3. Drive your Vehicle

3.1 Initial Start up

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

****Note: When you unplug your ECU it loses its “memory” and the car may drive rough for the first few minutes. Drive the car around for ten minutes and the car should be running smoothly again.**

Your car should feel more responsive now! You should also be experiencing more power and smoother acceleration. We hope you are satisfied with our product. Thank you for choosing Miller Performance for you BMW performance needs.

3.2 Troubleshooting

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

1. Ensure all your wiring was done correctly.
2. Ensure MAF is plugged in properly
3. Ensure Air Filter is Clean.
4. Check your Throttle Position Switch, this is a very common problem and you will not be able to access your “Full Throttle Maps” causing a loss in performance and drivability.
5. Ensure the Chip that was sent was for your ECU number.
6. Refer to the extended troubleshooting guide on our website.

If you cannot resolve the problem please phone us and we will help walk you through a solution. You can reach us on our toll free number, 855.BMW.TUNER. We will not let you go unsatisfied.