

MILLER PERFORMANCE



S38/M88 Mass Air Flow Conversion System

Instruction Manual

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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 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. Have a limited warranty of one year 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.

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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 S38/M88 3.5L 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:

- Precision designed MAF housing
- Stock Mountable design
- Quality anodized billet aluminum
- Excellent flow rating
- Fast install time

1.3 Parts Included (System Contents)






Part Number	Descriptions	Quantity
MPC-AMH-0030	M88/S38 MAF Housing	1
MPC-CAS-0100	Miller MAF Sensor Assembly	1
MPC-CAS-0150	Air Temp Sensor Assembly	1
MPC-SFT-38XX	Miller Performance Chip	1
MPC-TLS-0001	Pin Removal Tool	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. Open glove box and remove plastic cover (two Philips screws)
2. Now the ECU will be exposed. Using a 10mm socket wrench, undo the four 10mm bolts.
3. Unplug the ECU from its connector harness. See figure 2.



Figure 2

4. Use a small screwdriver to remove the screw on the back to the ECU plug connector.
5. After the removal of one screw, carefully remove the plastic harness housing off the ECU plug.

6. Once you have successfully removed the harness from its casing you should end up with something like this. See figure 3.

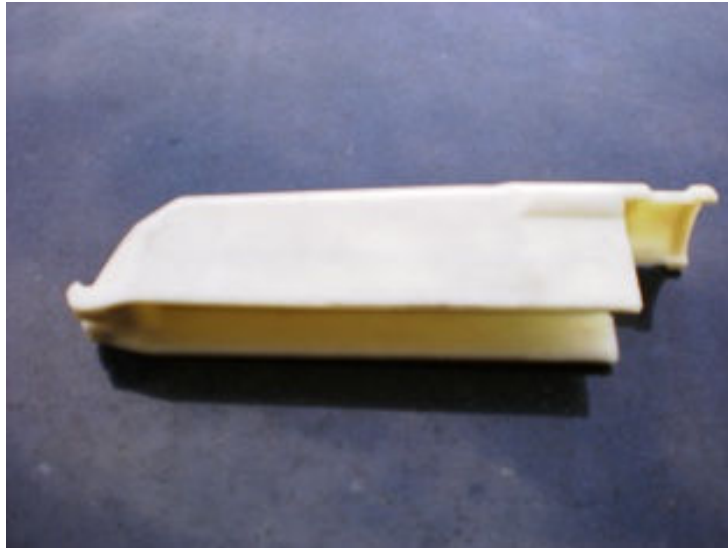


Figure 3

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

2.4 ECU Retrofit (Adapting to Miller MAF requirements)

Don't be intimidated by this procedure. It involves four 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.

In these next few steps you will be required to remove a few pins from the ECU connector plug and relocate them to different slots. Understand the below pictures so you are aware of how the pins are kept in place. This re-routing is a retrofit and is easily reversed if you need to go back to your AFM set up.

READ THIS SECTION SLOWLY AND CAREFULLY!

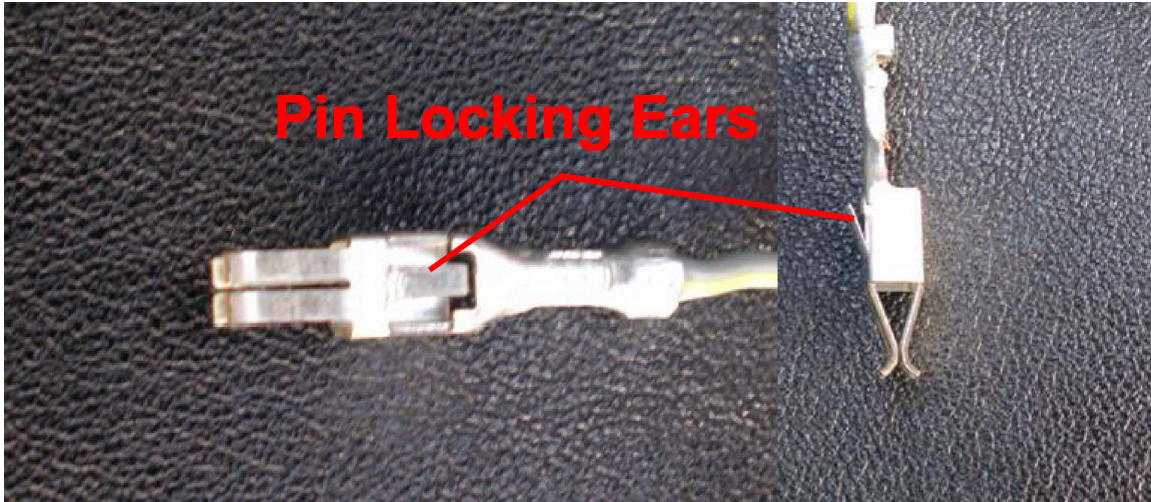


Figure 4

This image shows the locking ear found on the ECU connector harness pins. They are on the top of the pin. You will have to use the pin tool provided for releasing this side of the pin.

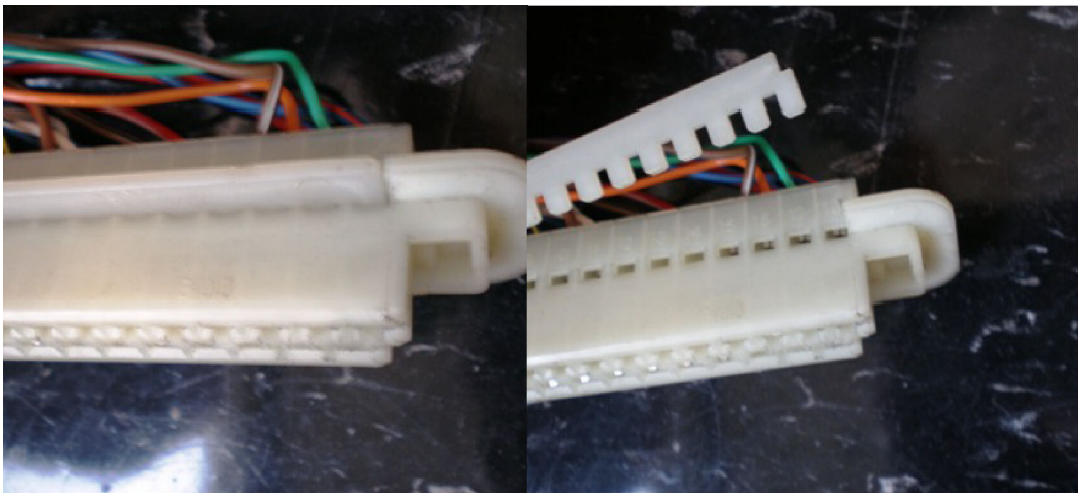


Figure 5

The ECU connector has 2 slides that will pull out from each side of the connector. Using simply your fingers, pull the locking slides out to release the one side of the pin. Note the difference above. Make sure you keep the slide out while using the pin removal tool.

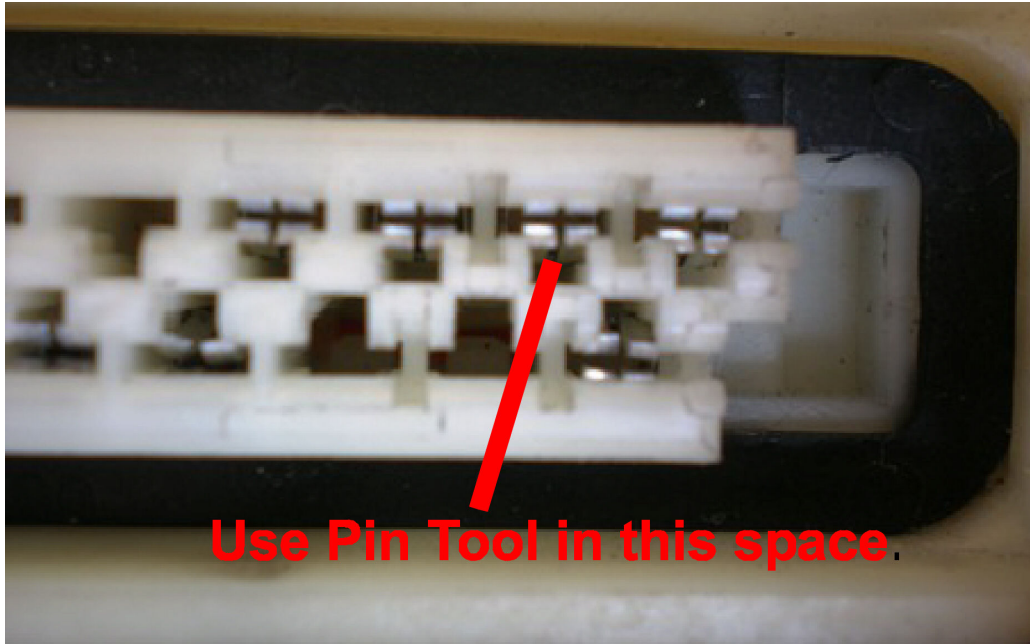


Figure 6

The above picture illustrates where to insert the pin removal tool. **Note that the above picture does not show the actual pin that needs to be removed. It is simply an example on how to use the tool.** . If the pin does not release ALL the way from the front, use the pin tool in the back to gently finish removing the pin. See figure 7.

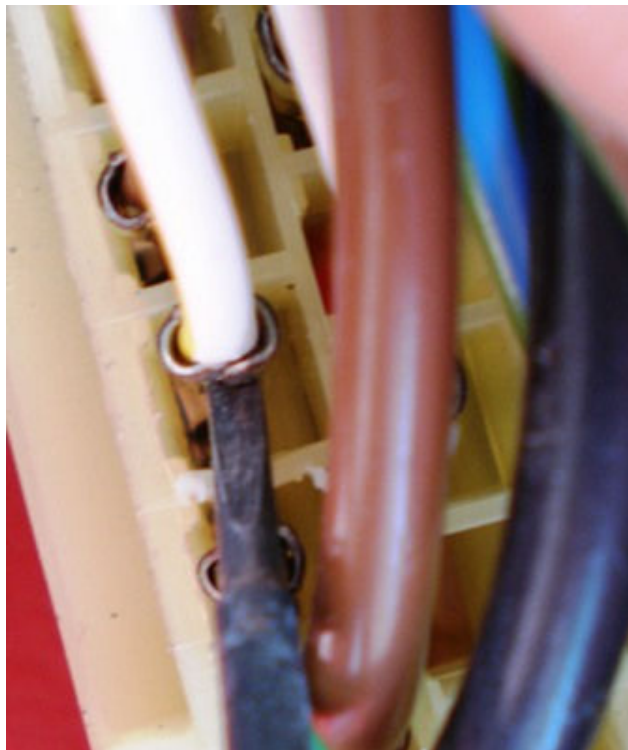


Figure 7

1. Locate and remove the following pins (make note of which color each pin is):
 - a. Pin 22
 - b. Pin 6
 - c. Pin 7
 - d. Pin 9
2. Once you have removed these pins, you have completed the hardest part.
3. The **Grey/Blue** or sometimes **Grey/Brown** wire must be inserted to the Pin #7 Location.
4. The **Grey/White** wire must be inserted to the Pin #6 Location.
5. The **Grey/Yellow** wire must be inserted to the Pin #22 Location.
6. Take the **Grey/Violet** wire and cut the connector pin off. Take the **Grey/Violet** wire and create a 'T' soldering it into the wire coming out of pin 35. The below picture illustrates this step.



Figure 8

7. 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.
8. 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. The end result should look similar to Figure 5. Make sure the chip provided is matched to the last three numbers of your ECU, ending in 055 or 079.



Figure 9

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

2.6 AFM to MAF Swap

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 fender side of the air box there is one nut. Undo it and set it aside.
2. Loosen the hose clamp on the back side of the Air Flow Meter (AFM). Unplug the plug going to the AFM.
3. Pull the Air Box with the AFM out. Open the Air Box and remove the four bolts to take off the AFM
4. Take the Miller Performance MAF housing and the four Allen head fasteners supplied and bolt the MAF housing to the Air Box.

2.6.2 Air Temp sensor Retrofit

In this step you will enable your ECU to sense intake air temperature.

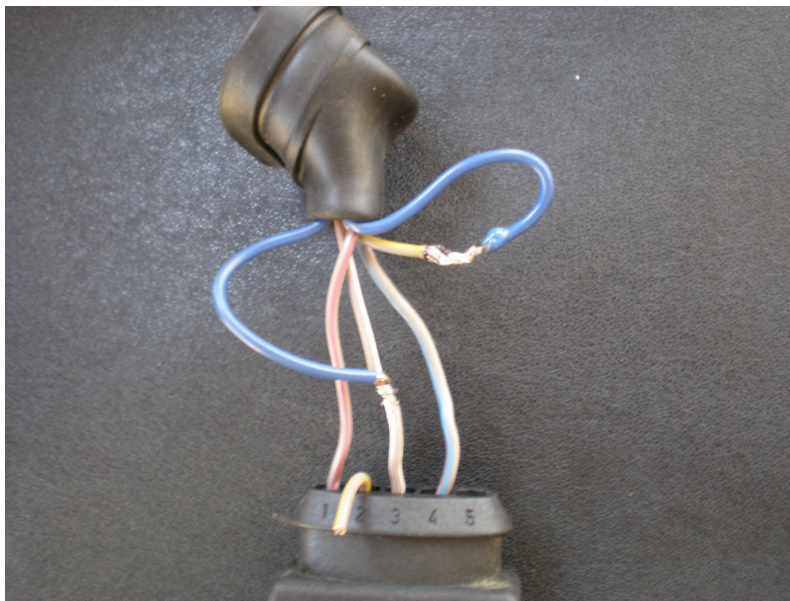


Figure 10

Pull back the rubber boot from the end of AFM plug to expose the wires. Cut the **Grey/Yellow** wire close to the plug. Slide the two wires from the air temp sensor harness under the boot. Connect one wire directly to the **Grey/Yellow** going to the ECU. Take the remaining wire and T into the **Grey/White** Wire. See the finished product below.



Figure 11

2.7 Reassembly

Now, install the Air Box with the MAF. Remember to bolt the air box back on the fender side and clamp it shut.

Take the hose and hose clamp leading to the Intake manifold and attach the circular side of the MAF to it. Make sure the hose clamp is securely fastened so the MAF does not slip out of the tube. Plug in the Miller Plug to the Factory AFM harness.

Your completed MAF System should look like this.



Figure 12

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 or until the car is 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 harness is plugged in.
3. Ensure Air Filter is Clean.
4. Ensure that you are using the right Octane gas that you requested your chip be programmed for.
5. 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.
6. Ensure the Chip that was sent was for your ECU number.

If you cannot resolve the problem please phone us and we will help walk you through a solution. You can reach us at (604) 755 7692. We will not let you go unsatisfied.