

**MERCEDES AMG45**

# HPFP UPGRADE

WARNING/DANGER: SERIOUS RISK OF FIRE, EXPLOSION, BODILY INJURY INCLUDING RESULTING DEATH, AND ENGINE, VEHICLE, AND OTHER PROPERTY DAMAGE. THIS FUEL PUMP MUST BE INSTALLED AND REMOVED ONLY BY A QUALIFIED MOTOR SPORTS TECHNICIAN. TECHNICIAN ALSO MUST BE TRAINED IN HOW TO INSTALL AND REMOVE THIS PUMP FROM THIS SPECIFIC VEHICLE. TECHNICIAN MUST NOT SMOKE OR PARTICIPATE IN ANY ACTIVITY THAT WOULD BE CONSIDERED A CATALYST FOR IGNITION WHILE INSTALLING OR REMOVING PUMP AND MUST READ ADDITIONAL SAFETY-INSTRUCTIONS BEFORE INSTALLATION OR REMOVAL.

# Table of Contents

PAGE	<b>03</b>	Introduction
PAGE	<b>04</b>	Fuel Pressure Relief
PAGE	<b>05</b>	Disassembly Guide
PAGE	<b>09</b>	Assembly & Installation
PAGE	<b>12</b>	Tuning

# Introduction

The goal of Alpha Performance is to provide the highest quality, best performing products available. By utilizing research and development, and rigorous testing programs Alpha Performance will never compromise the quality or performance of our products. In addition, Alpha Performance will only provide the finest customer service offering only parts and advice that are in the best interests of the customer. Alpha Performance was built on a foundation of integrity. This is who we are; this is what you can count on.

A vehicle modified by the use of performance parts may not meet the legal requirements for use on public roads. Federal and state laws prohibit the removal, modification, or rendering inoperative of any part or element of design affecting emissions or safety on motor vehicles used for transporting persons or property on public streets or highways. Use or installation of performance parts may adversely affect the drivability and reliability of your vehicle, and may also affect or eliminate your insurance coverage, factory warranty, and/or new OEM part warranty. Performance parts are sold as-is without any warranty of any type. There is no warranty stated or implied due to the stresses placed on your vehicle by performance parts and our inability to monitor their use, tuning, or modification.

These instructions are provided as a guide only as there are many variables that cannot be accounted for concerning your particular vehicle, including but not limited to model year differences, model differences, the presence of non-OEM parts, and modifications that may already be or were previously installed. A basic knowledge of automotive parts and systems is helpful but a better understanding of the parts and systems on your particular vehicle may be required.

If you have any questions or issues at any time during the installation of your Alpha Performance product(s) please call us for technical assistance. The Alpha Performance tech line can be reached during business hours at 847-709-0530 for Alpha Performance products only.



# Fuel Pressure Relief

---

**Note.** The Alpha HPFP upgrade requires specific calibration changes to your ECU in order to operate. DO NOT start the engine until these calibration changes have been made. Engine or pump damage can/will occur.

**WARNING/DANGER: SERIOUS RISK OF FIRE, EXPLOSION, BODILY INJURY INCLUDING RESULTING DEATH, AND ENGINE, VEHICLE, AND OTHER PROPERTY DAMAGE. THIS FUEL PUMP MUST BE INSTALLED AND REMOVED ONLY BY A QUALIFIED MOTOR SPORTS TECHNICIAN. TECHNICIAN ALSO MUST BE TRAINED IN HOW TO INSTALL AND REMOVE THIS PUMP FROM THIS SPECIFIC VEHICLE. TECHNICIAN MUST NOT SMOKE OR PARTICIPATE IN ANY ACTIVITY THAT WOULD BE CONSIDERED A CATALYST FOR IGNITION WHILE INSTALLING OR REMOVING PUMP AND MUST READ ADDITIONAL SAFETY-INSTRUCTIONS BEFORE INSTALLATION OR REMOVAL.**

**Warning!** Make sure the engine has cooled down. Disconnecting fuel lines on a hot engine can potentially cause boiling fuel to exit the fuel lines under pressure. Fuel temperatures in the low side fuel line can be as high as 150 degrees Fahrenheit at the inlet of the HPFP and the high side line can be significantly higher temperature as the system operates at pressures of 200 bar. At a minimum, fuel in the high side rails and lines will follow engine bay temperature. Make sure to follow the OEM fuel pressure relieving procedure.

Pressure relief of the low pressure and high pressure fuel system is required. Steps can be taken to relieve pressure from the fuel system by carrying out procedures using the OEM STAR Diagnostics tool. If there is no access to the factory star tool, it is recommended to take the following steps to ensure safe disconnection of applicable fuel lines.

1. Disconnect battery.

**Caution: It is possible for the low pressure pump to activate with the battery connected and the key off. If the fuel line has been disconnected, a fire may occur.**

2. Completely cover the connection points on the high pressure lines to be opened using suitable rags.
3. Partially loosen union nuts carefully for the high pressure line to be opened.
4. Let the fuel collect into the surrounding rags until all pressure is released.
5. Continue carefully and slowly loosening the union nuts until it is sure that all pressure is released.

**Note:** The pressure in the high pressure fuel circuit is higher on an engine at or near operating temperature, which causes a larger fuel quantity to leak out. For this reason, it is suggested to let the car cool to ambient temperatures before attempting installation. Additionally, absolute cleanliness is essential when working on a high pressure fuel circuit. Thoroughly clean the surrounding area of the separation point before opening the high pressure fuel circuit. Only lint-free cleaning cloths may be used. Even the smallest debris particles in the hydraulic components can lead to malfunctions and a total failure of the high pressure fuel circuit. During this process always wear oil/chemical-resistant, fiber-free gloves which are lined with rubber.



## Dissassembly

01. Remove the engine cover by holding firmly on opposing sides and then by pulling straight upwards away from the engine. Also remove the battery cover by sliding the cover toward the front of the vehicle and then lifting upwards.

**IMPORTANT:** Disconnect the battery ground terminal and secure the harness to the side to avoid any accidental re-connection or possible spark. DO NOT leave the battery connected. If certain conditions are met, the car can cycle the low side fuel pump, even with the key on the "off" position.



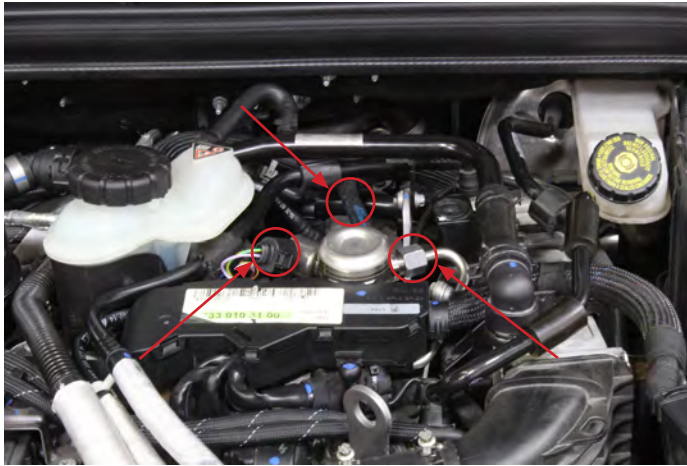
02. Locate the High Pressure Fuel Pump (HPFP) located directly in the center of the engine bay on the left-hand side of the intercooler coolant reservoir. The HPFP has a foam sound deadening cover/cap that needs to be removed in order to continue. Pull straight up on the cover, rocking back and forth slightly to remove.



03. Disconnect the fuel lines from the HPFP

- a. Disconnect the rubber HPFP fuel inlet hose. This is located on the rear-most side of the HPFP. **Warning!** This may still be under pressure. Be sure to note the "Dangers, risks, and warnings" found at the beginning of this instruction booklet.

- b. Loosen the union nut on the high pressure hardline on the left-hand side of the HPFP. Loosen slowly. (19mm) **Warning!** This may still be under pressure. Be sure to note the "Dangers, risks, and warnings" found at the beginning of this instruction booklet.
- c. Disconnect the electrical connection on the right-hand side of the HPFP



04. Remove the plastic engine cover mounting stud.





05. Remove the 2 screws (T30 Torx) securing the main engine wiring harness.



06. Lift up on the main engine wire harness to gain access to the union nut on the high pressure hardline where it connects the fuel rail. There is a stud the plastic harness loom clips into between the intercooler and cylinder head. Move the harness towards the intercooler to release the harness off this stud. You may be required to use a flat head to pry it off the stud in certain cases. Disconnect the fuel line from the rail.



07. Remove the screw holding the HPFP hardline to the support bracket. Then remove the hardline from the vehicle..

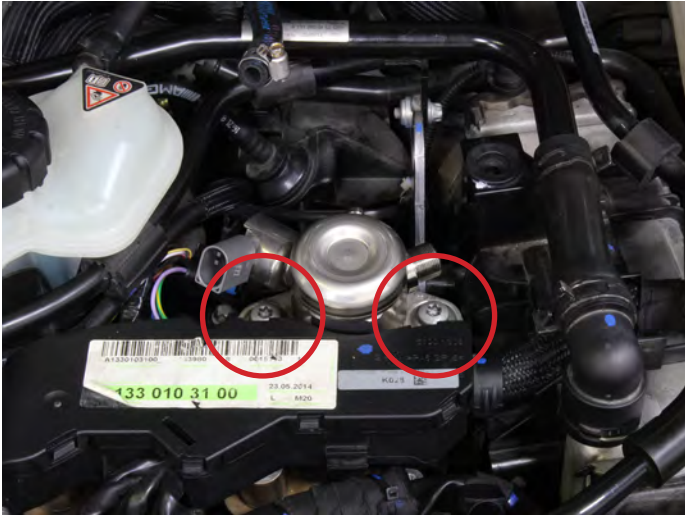


08. Remove the 2 screws securing the hardline support bracket. Then remove the bracket from the vehicle. This bracket will not be reused.





09. Remove the 2 (T40 Torx) screws holding the HPFP in place. (These will be reused) **Important:** Remove the screws by turning them 1/4 turn at a time alternating between the 2 screws. Failure to do so can damage the pump and will damage the bore in the cylinder head. The pump is under spring pressure and will rise with each turn of the screws until it is fully extended.



## Assembly and Installation

10. Locate the HPFP adaptor plate and the plastic flange alignment tool seen in the pictures below. Be sure the O-ring is correctly seated in the bottom of the adaptor plate. Install the adaptor plate as shown below. Use the plastic flange alignment tool to center the adapter plate before tightening the screws. Tighten the screws to **16FT/LB or 22NM**.



11. Depending on the current rotational position of the engine, the cam bucket which drives the HPFP may not be at bottom dead center, or, the base circle of the cam shaft. The HPFP bucket needs to be at the bottom of the bore before installing the HPFP. Turn the engine over by hand and watch to make sure the HPFP cam bucket is at its lowest point. Install the HPFP and slowly tighten the M6 allen head bolts equally side to side making sure the pump is drawn in straight.
- a. Tighten the allen head bolts to 8 ft lbs (10.8 Nm)

**CAUTION:** Failure to follow the above step will result in HPFP or mounting flange damage.



12. Locate the new HPFP hardline supplied in your kit. Lubricate the threads of the union nuts with engine oil to avoid galling of the threads during installation. Feed/set the supplied hardline into place as shown in the pictures below. Hand tighten the union nuts into place before final tightening.
- a. Tightening procedure:

**Step 1:** Tighten each nut to 15nm or 11ft/lbs.

**Step 2:** Tighten/rotate each nut 75degrees

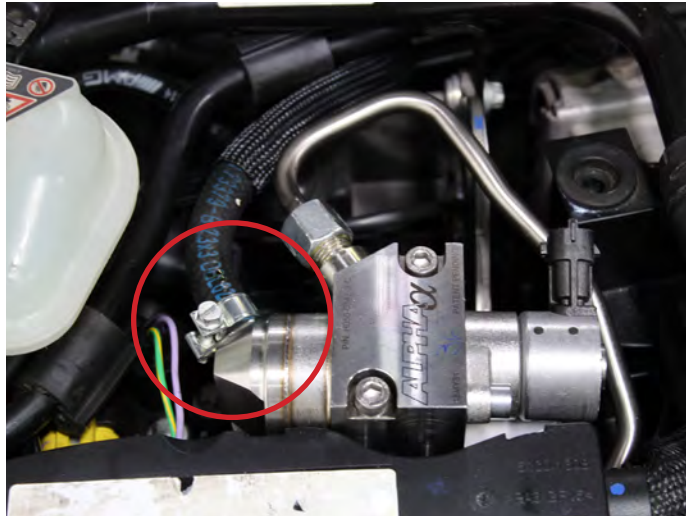
**Step 3:** Tighten/rotate each nut a final 25degrees

**Warning:** Failure to follow the outlined tightening sequence can result in a poor seal, causing fuel to leak or thread damage.





13. Using the supplied clamp, reinstall the rubber HPFP fuel inlet hose as shown.



14. Locate the supplied HPFP wire harness adaptor. Install and route the harness as shown below

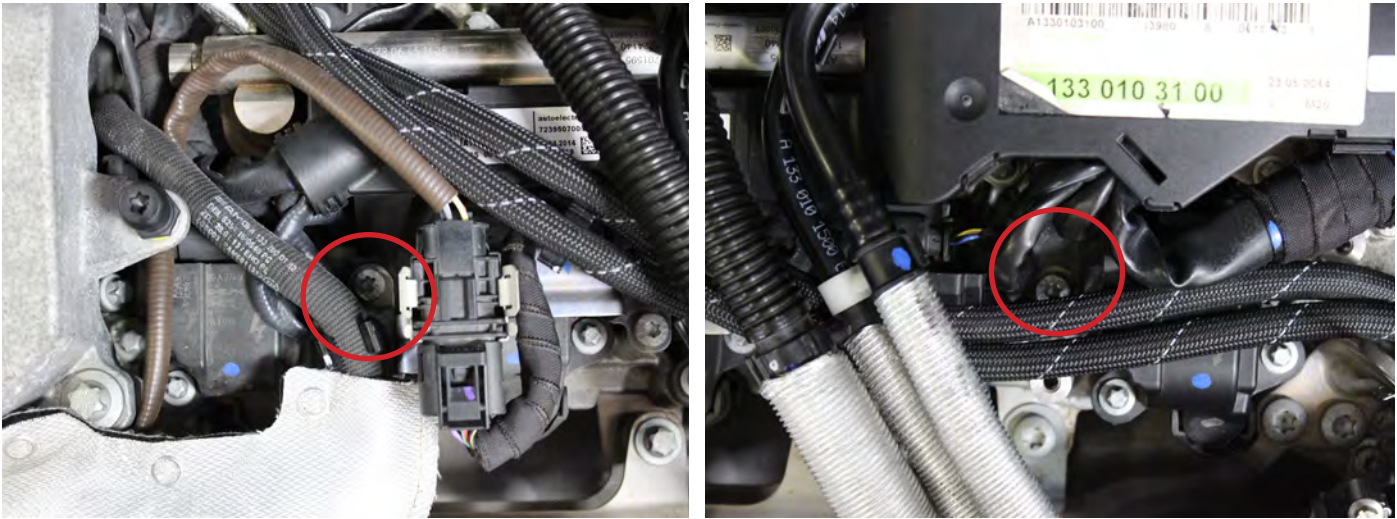


15. Install the silicone coupler in the car. First attach the PCV vent hose using the smaller OEM clamp. Then fully install the coupler onto the turbo inlet. Do not tighten the hose clamp yet.





16. Re-secure the main engine wiring harness with the 2 screws removed in step 5.



17. Re-connect the ground terminal on the battery and reinstall the battery cover.

18. Prime the low side fuel system and inspect for leaks. The low side fuel system can be primed using the Mercedes STAR diagnostic tool.

19. Start the engine (Only with Alpha Calibration for upgraded HPFP) and further inspect for leaks.

**Note:** The Alpha HPFP upgrade requires specific calibration changes to your ECU in order to operate. DO NOT start the engine until these calibration changes have been made. Engine or pump damage can/will occur.

20. After confirming leak free operation, reinstall the engine cover.

## Tuning

21. In order to take full advantage of our HPFP and to prevent engine or pump damage, special Alpha calibrations to your tune will need to be made. Once the HPFP is installed, the vehicle will not run safely unless the necessary calibration changes are made. Please contact an Alpha sales representative for your ECU calibration needs.