

2012 SLK 350 3.5 V6 (M276 Engine) Spark Plug Replacement

Proceed at your own risk. I read the Mercedes repair documents pertaining to changing the R172 SLK M276 V6 engine's spark plugs that I could find but the documents tend to be quite brief and simplistic. However, that does not mean that all of the steps listed below are recommended by Mercedes.

Like most modern gasoline engines the M276 engine has an ignition coil (six in total) mounted to the top of each spark plug. Each ignition coil must be removed before the spark plug can be removed. I ran into several problems removing the ignition coils on the left side of the engine that took several days of research to resolve.

1. Start with a cold engine.
2. Make sure the engine is turned off and the **Key Removed** from the ignition.
3. Open the hood and raise it to the vertical position.
4. Remove front engine cover by first pulling up the front of the cover and then pulling the cover up from each corner to release all the clips (five in all):



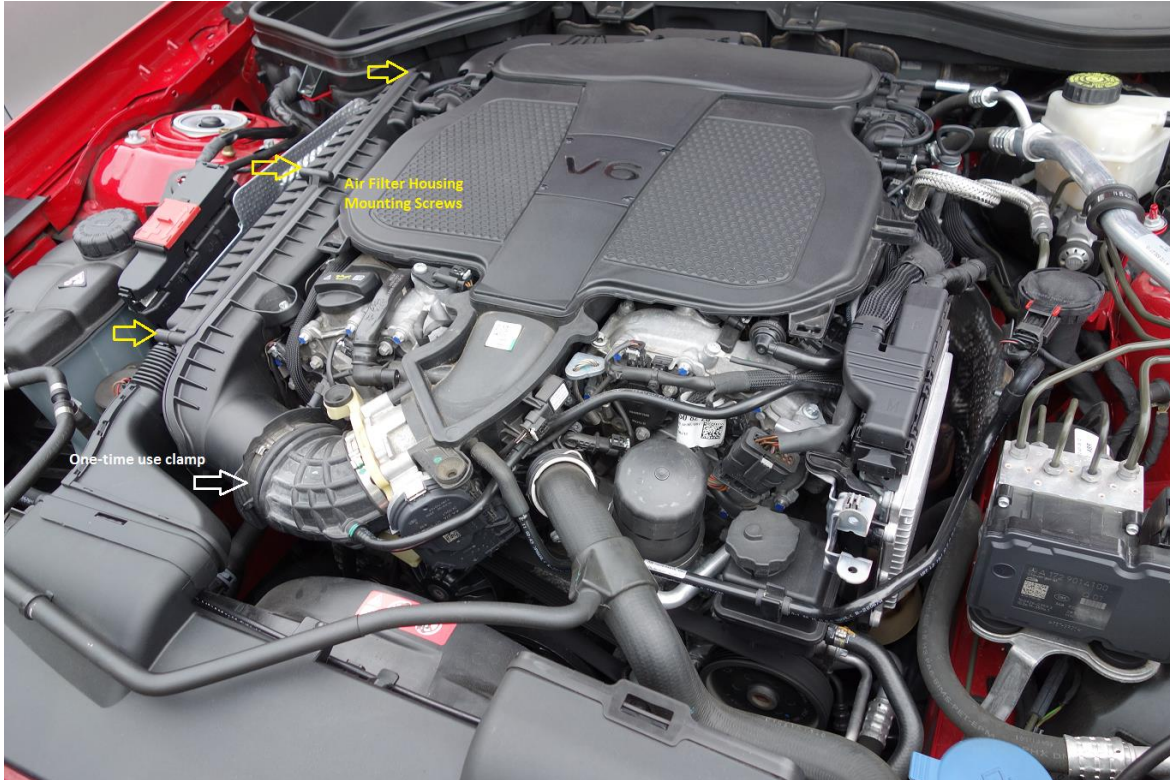
Front engine cover removed, showing the location of the five mounting clips:



Prepping the **Right Side** of the Engine

NOTE: I actually started on the **left side** of the engine since access to the ignition coils and spark plugs on that side is the worst. I figured if I was going to run into a show-stopper it was better to encounter that right away rather than later on in the project. As noted above I did run into several problems removing the ignition coils on the left side of the engine that took several days of research to resolve.

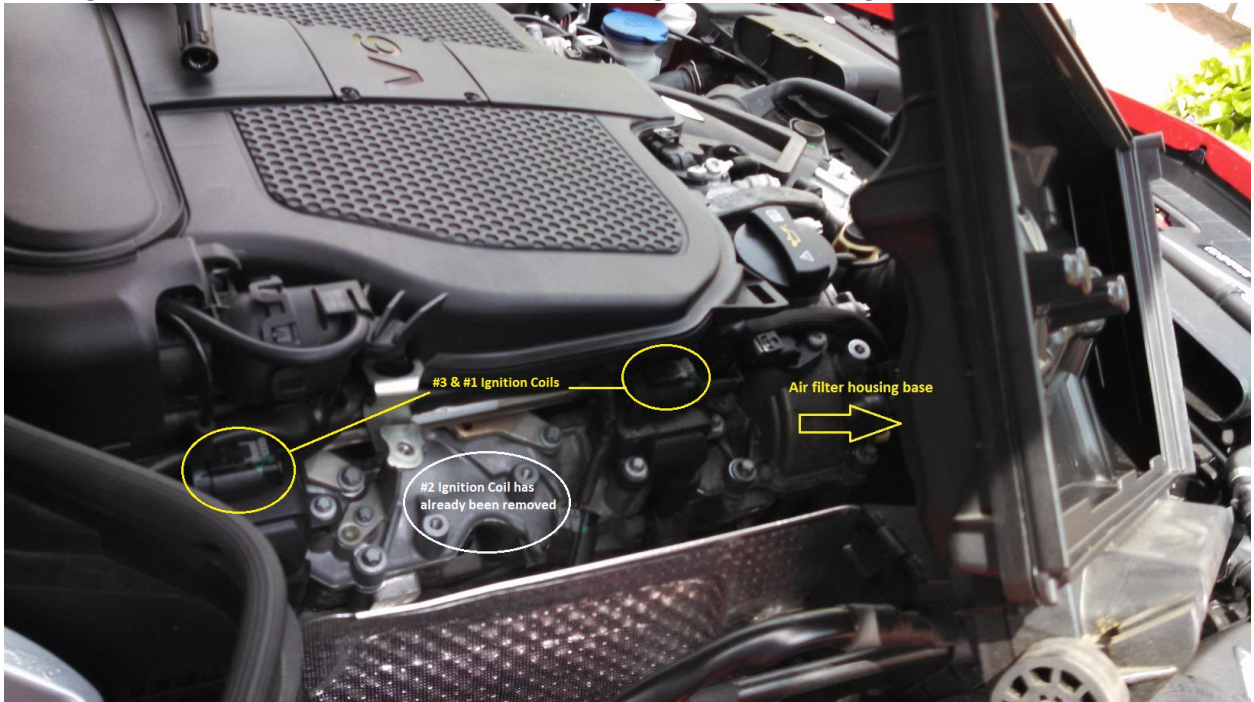
5. Remove the air filter housing cover by unbolting the three Torx screws along the top edge of the housing. Note that the mounting screws are not removed from the housing cover.



6. Remove the air filter from the housing (not shown).
7. Unbolt the two Torx bolts holding the air filter housing base to the right side of the engine:



8. Do not remove the one-time use clamp holding the air filter housing tube to the resonance intake manifold (see the white text and arrow in the step 5 photo above). If you do remove the clamp you will have to buy a new one as it is a one-time use part.
9. Carefully move the air filter housing out of the way of the ignition coils by gently moving the housing towards the front of the engine. Be careful not to damage the plastic/rubber tube connecting the housing to the resonance intake manifold while moving the filter housing.



The Air filter housing moved out of the way of the right side of the engine as seen from the front of the engine:



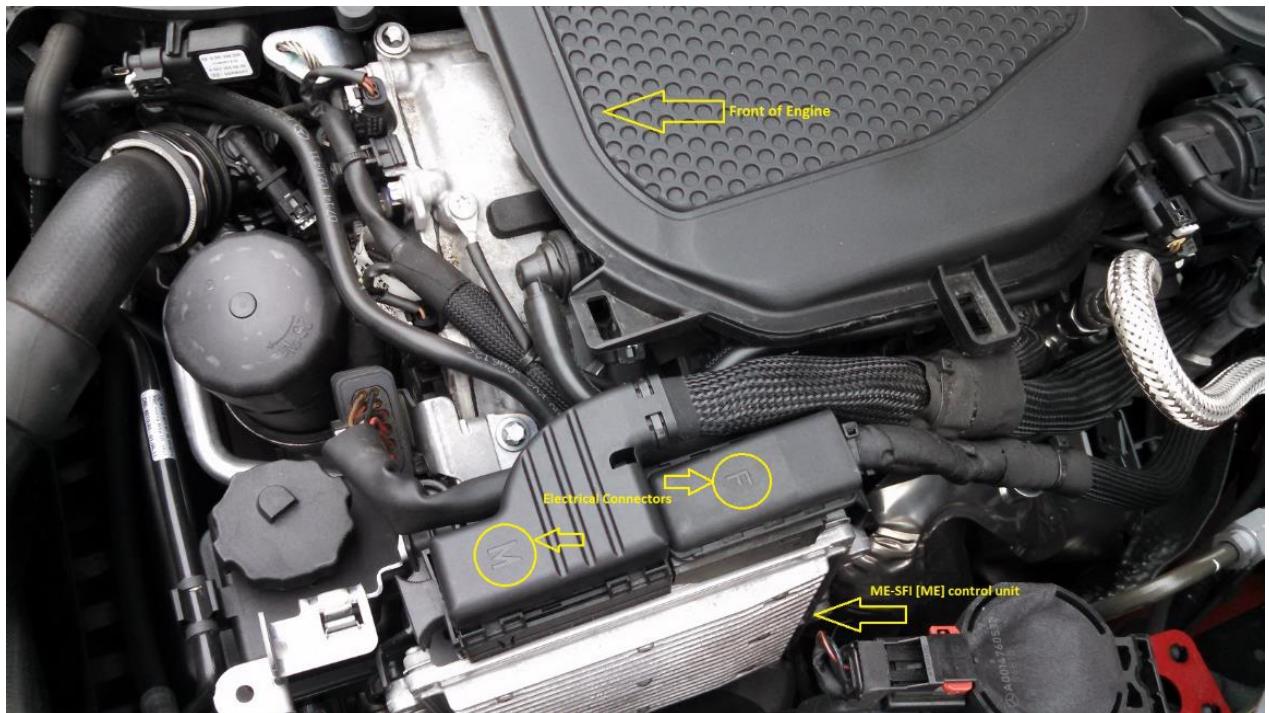
Prepping the **Left Side** of the Engine

10. Remove the Injection System Control Unit (also referred to as ME-SFI [ME] Control Unit or Engine Control Unit [ECU], etc.) by following the steps below.

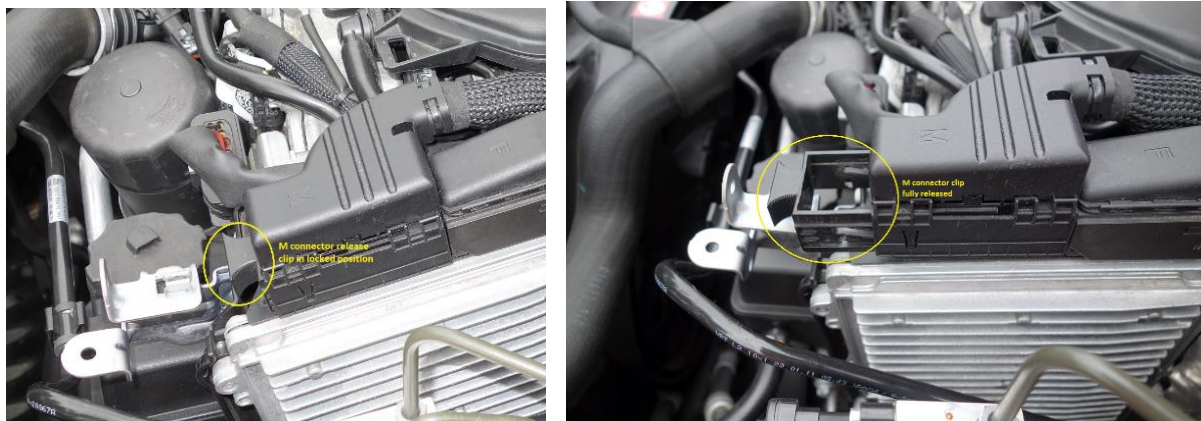
Note #1: the Mercedes repair documents do not mention removing the ME Control Unit to replace the spark plugs. However, I found that removing the control unit made access to the ignition coils and spark plugs much easier.

Note #2: the Mercedes documents say to disconnect the battery BEFORE removing the electrical connections from the control unit. For what it's worth, I never disconnected the battery and removed the control unit six or more times while working on this project with no ill effects at all.

Make sure engine is off and key removed from ignition. Otherwise the control unit can be damaged and it costs over \$1,100! Plus a trip to the dealer will be required to program a new one. Also, do NOT turn on the engine while any part of the ignition system is disassembled!

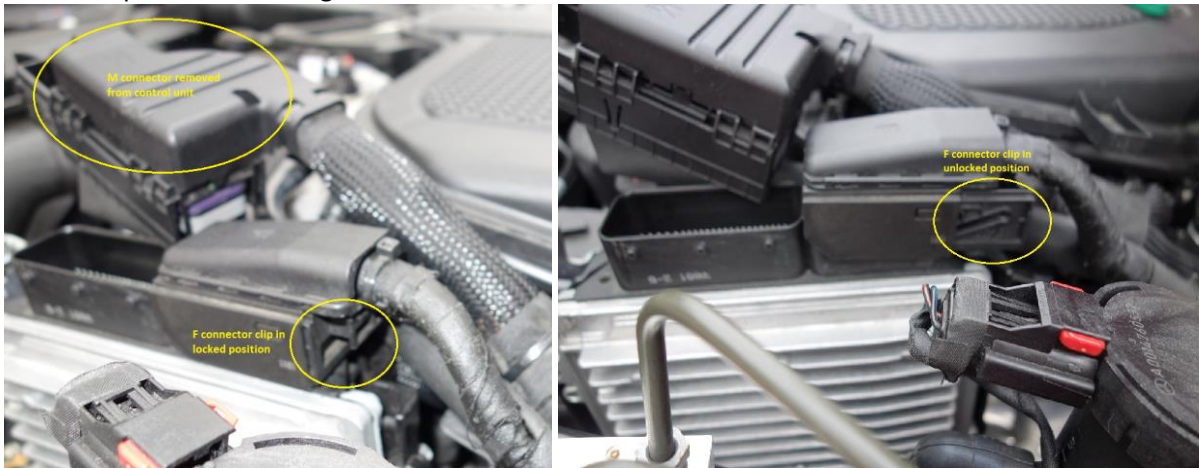


Disconnect the **M** electrical connector from the top of the control unit by pulling the **release clip** on the front of the connector as far as it will go towards the front of the car:



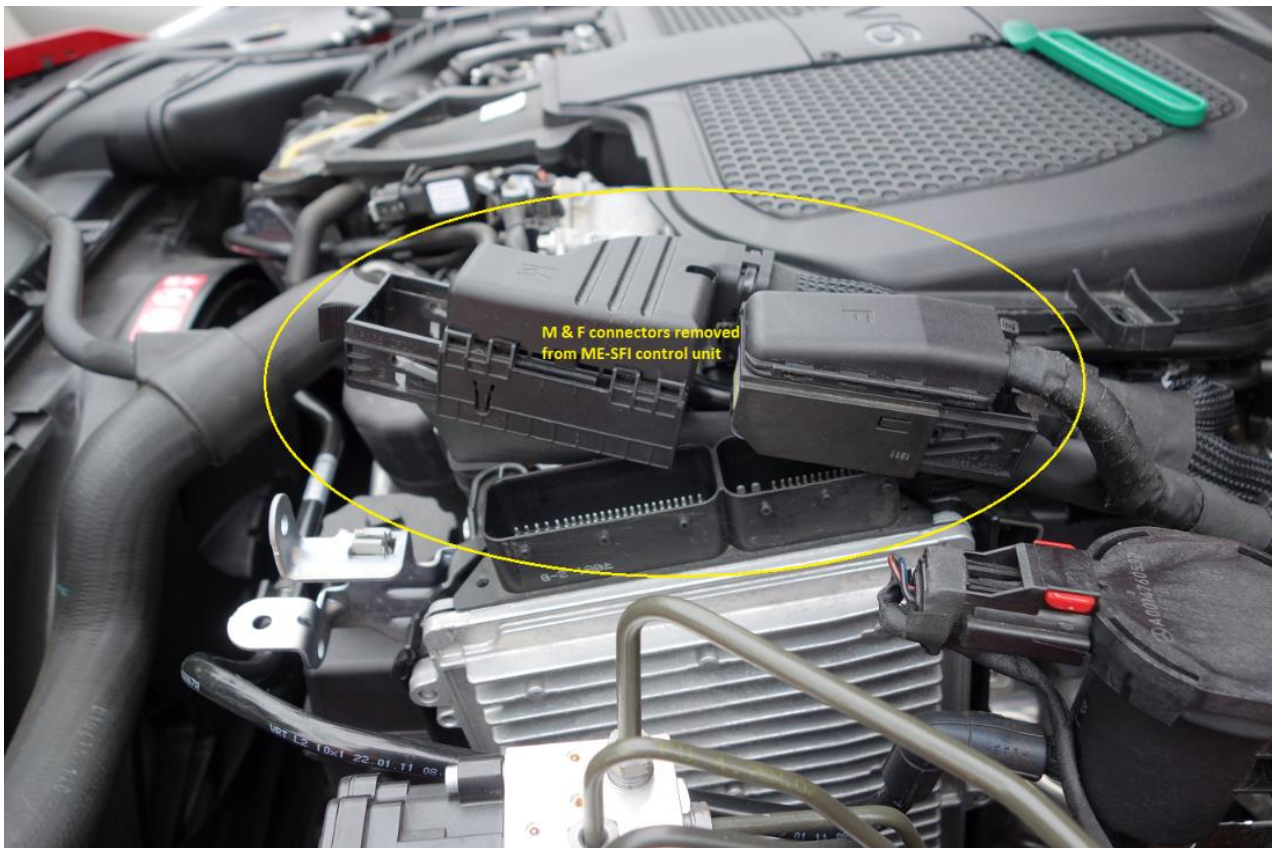
Pull the **M** connector straight up to remove it from the control unit as seen in the first photo below.

Disconnect the **F** electrical connector from the top of the control unit by pulling the connector's rear release clip as far as it will go towards the rear of the car:



Now pull the **F** connector straight up to remove it from the control unit.

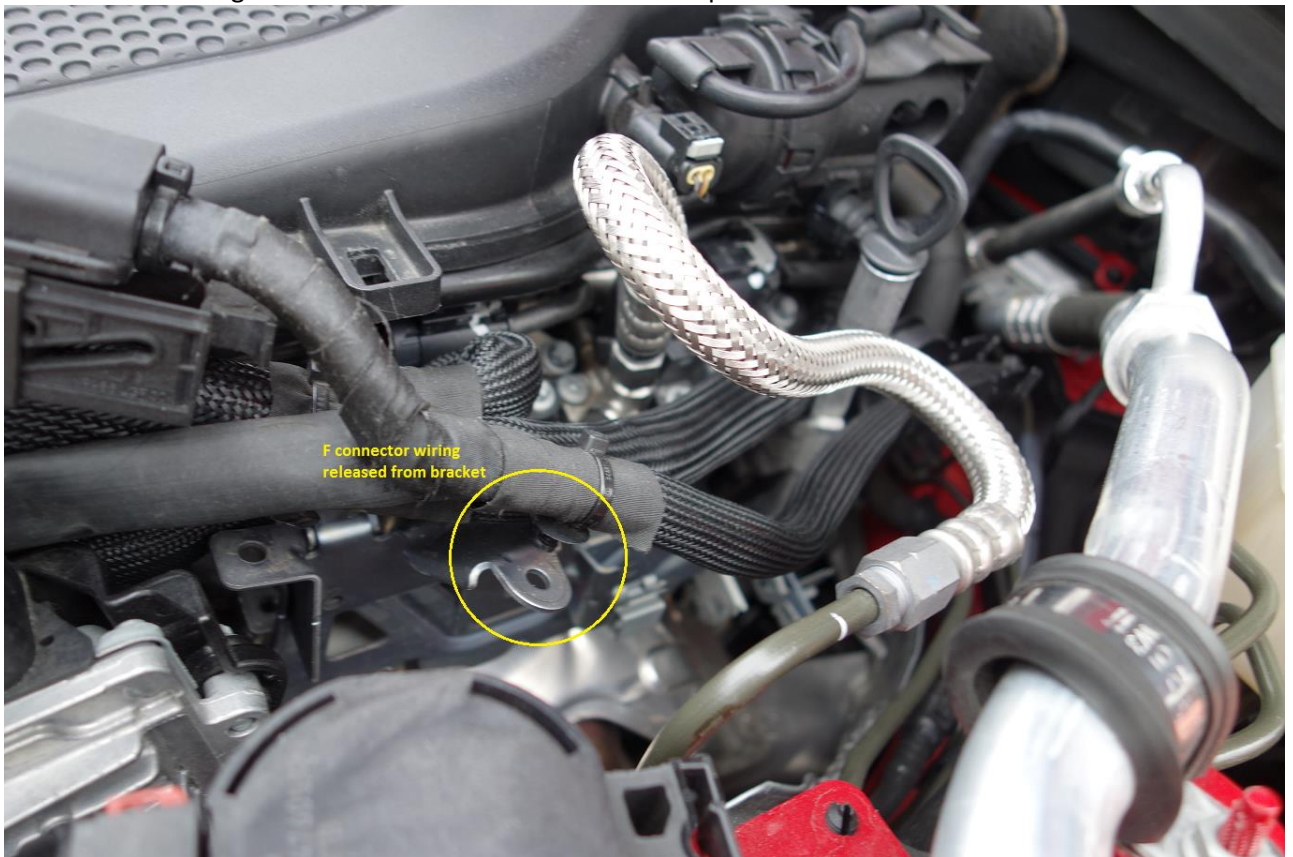
Both **M** and **F** electrical connectors removed from ME-SFI Control Unit:



11. Pull the F connector's wiring harness up to release it from the tie down clip on the ME-SFI bracket:



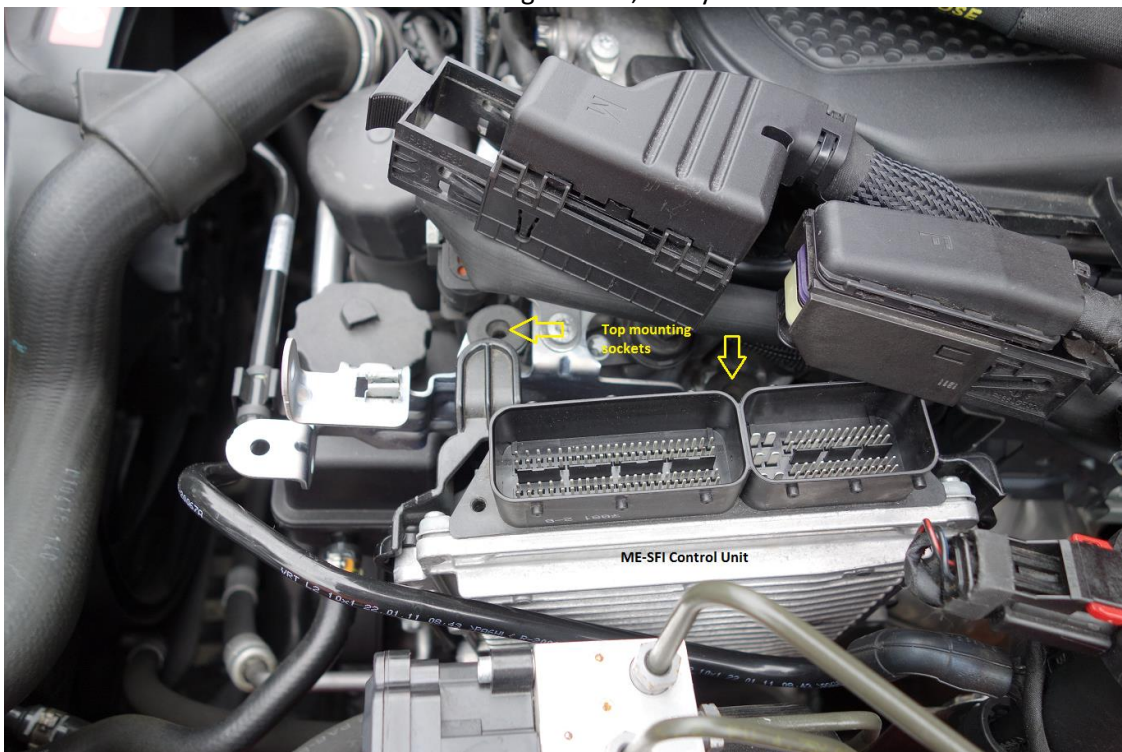
F connector's wiring harness released from the tie down clip on the ME-SFI bracket:



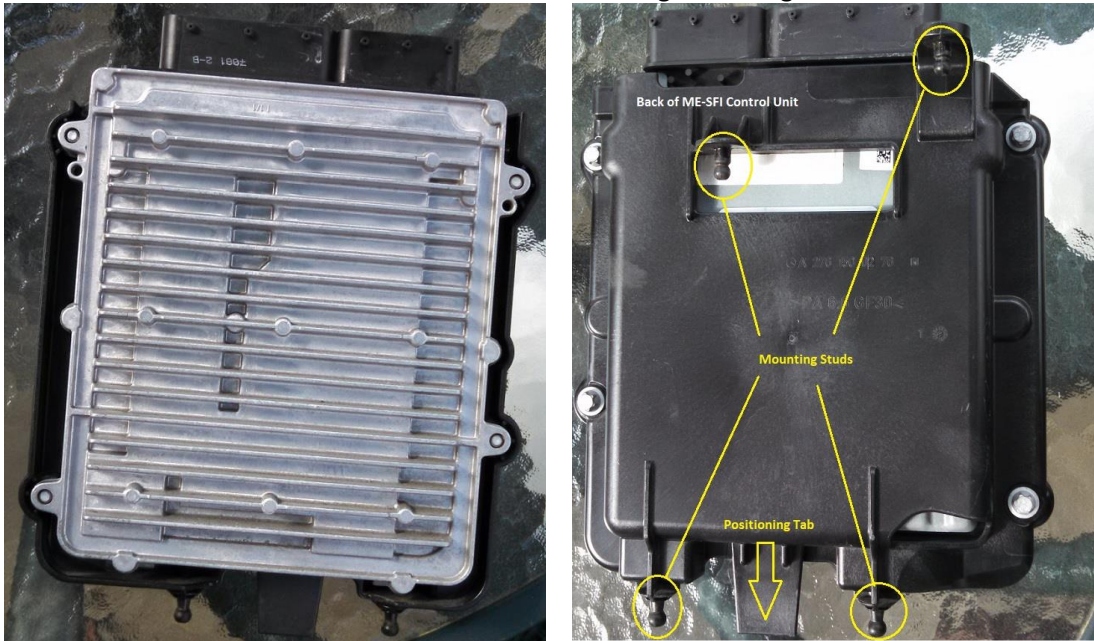
12. Push the M and F connectors' wiring out of the way of the ME-SFI control unit towards the middle of the engine.
13. Push the ME-SFI Control Unit up from its bottom to free it from the mounting bracket. The bracket has four rubber sockets that the control unit mounting studs are pushed into, two at the top and two at the bottom. Wear gloves when doing this since the clearance around the bottom of the control unit is quite tight. It takes a bit of force to release the control unit from the bracket mounting sockets and you will probably bang up your hands when it does release.



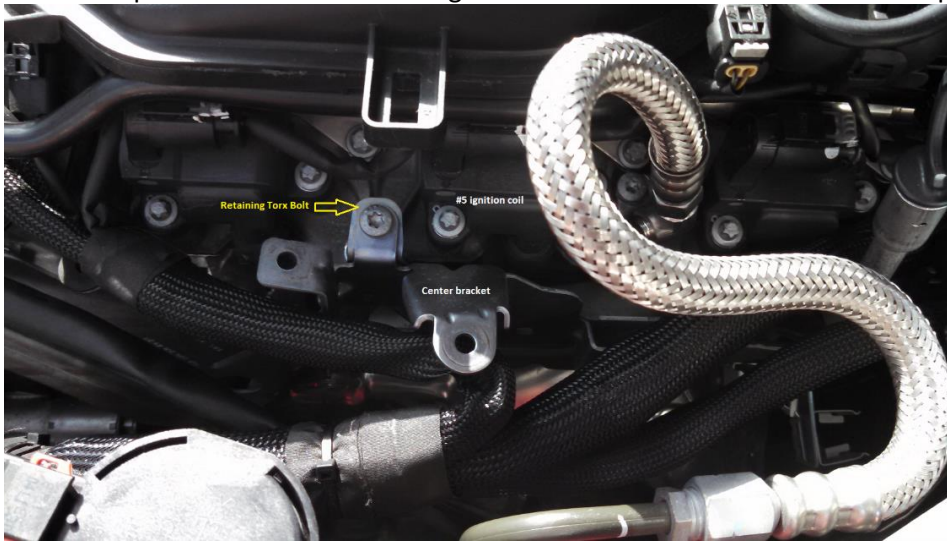
ME-SFI Control Unit released from mounting bracket, ready to be removed from car:



Front and back of removed ME-SFI Control unit showing mounting studs:

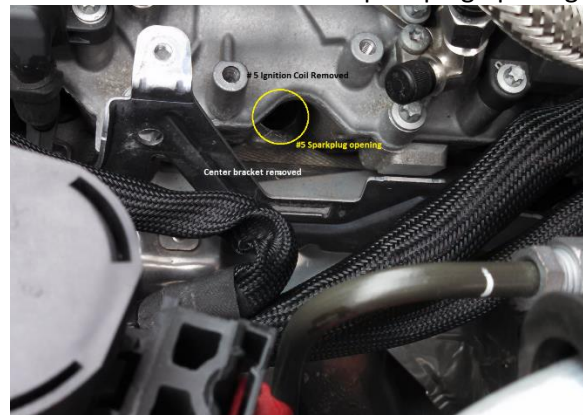
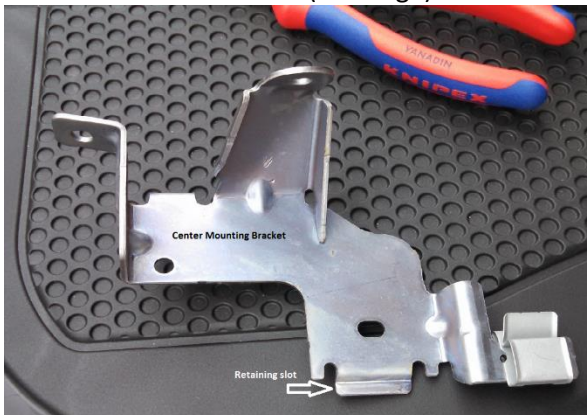


14. In order to gain access to the #5 spark plug and its ignition coil, the center part of the control unit mounting bracket must be removed. This is where the F Connector wiring harness was removed from in step #11. Unbolt the retaining Torx bolt and slide the center bracket up to remove it:



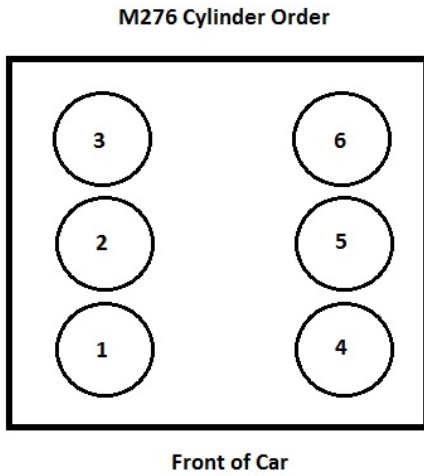
Removed Center Bracket (1st image).

#5 coil removed to show access to spark plug opening:



Removing Ignition Coils and Replacing Spark Plugs

15. Start with the **#6 ignition coil** which is probably the most difficult to remove:

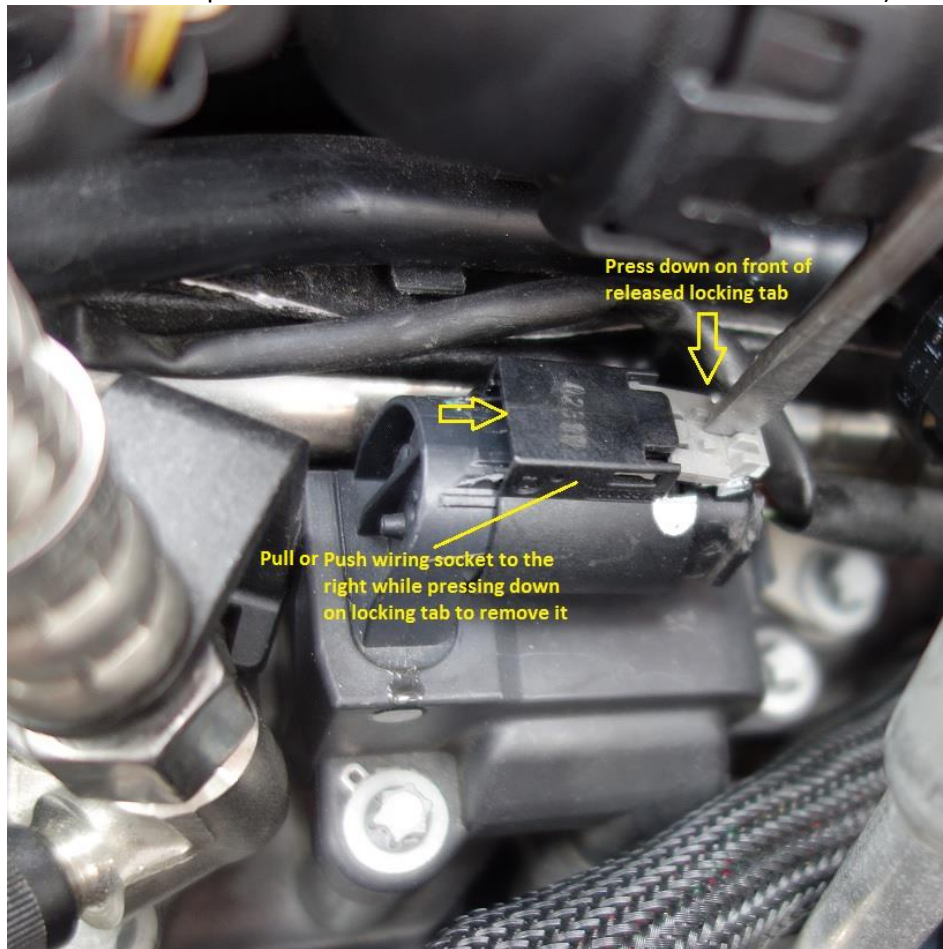


- a. On the top of the ignition coil, slide the ignition wire socket **light grey locking tab** to the right to release the socket lock:



- b. Note: removing a wiring socket from an ignition coil can be dicey. Sometimes a socket will release easily from an ignition coil while other times it can be much harder to get the socket off.

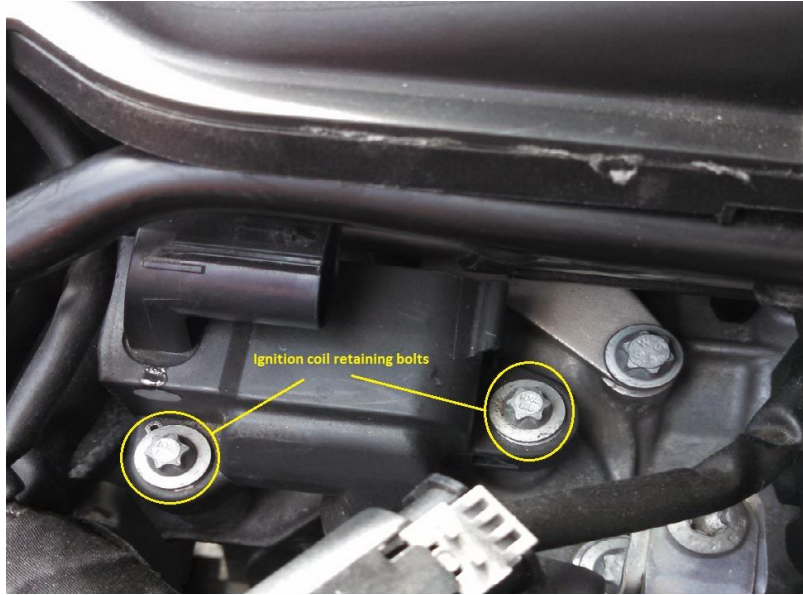
- c. Remove the wiring socket from the ignition coil by pulling the socket away from the coil while pushing down on the grey tab at the same time. If that does not work try pushing the top of the socket to the right while pressing down on the front of the grey locking tab (I used a screwdriver to press the tab down in this case because of limited access):



Ignition coil wiring socket removed from coil:



- d. Unbolt the two Torx bolts holding the ignition coil to the engine head:



16. The ignition coil and spark plug connector form a single unit as seen in the first image below:



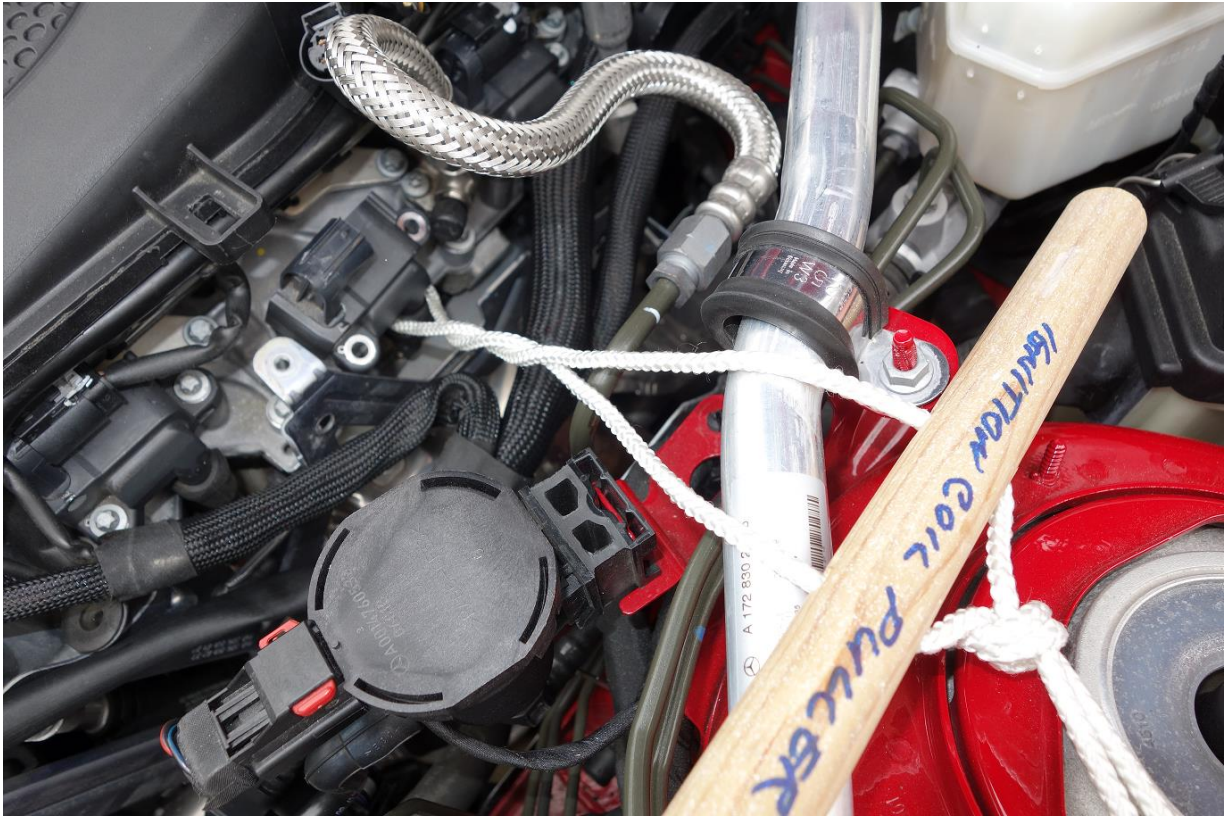
On the left side of the engine I could not get a good enough grip on the coil to get it to release from the spark plug. This is a known problem as Mercedes now recommends using spark plug connector grease on the inside of the connector boot when installing ignition coils (see the end of this document for more details).

On the right side of the engine this was not a problem as I was able to pull the ignition coils from the spark plugs by hand.

To get around this problem I made an "ignition coil puller" from a piece of wooden broom stick and some nylon cord →



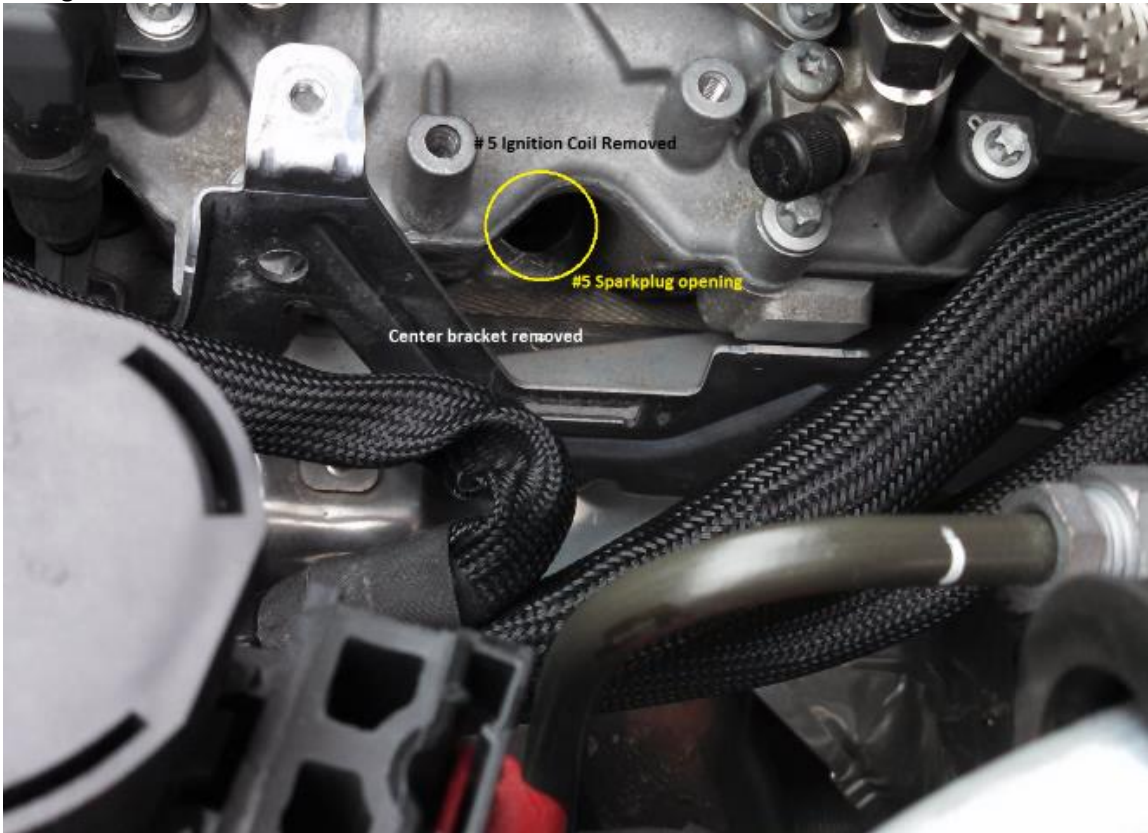
17. Using the handmade puller, wrap the nylon cord around the base of the ignition coil and twist the cord to retain a good fit around the coil (#5 ignition coil shown for clarity):



Now pull the wooden handle straight up (or as much straight up as you can manage). The coil spark plug connector should release from the spark plug with a loud pop:



The ignition coil removed:



18. Now the spark plug can be removed using a thin-wall, 14 mm, 12 point spark plug socket.

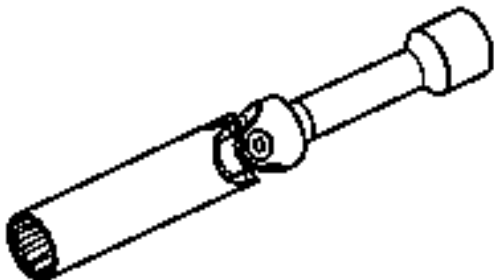
I used this 3/8" drive 14mm 12 point spark plug socket that I found on eBay:

<http://www.ebay.com/itm/MINI-Spark-Plug-Socket-Thin-Wall-3-8-Drive-12-PT-Point-14mm-FITS-BMW-MERCEDES-/161581637358?hash=item259f041eee&item=161581637358&vxp=mtr>



The genuine Mercedes spark plug socket (278 589 00 09 00) can be found here (at over double the price of the one above):

<http://www.ebay.com/itm/MINI-Spark-Plug-Socket-Thin-Wall-3-8-Drive-12-PT-Point-14mm-FITS-BMW-MERCEDES-/161581637358?hash=item259f041eee&item=161581637358&vxp=mtr>



Note: you will have to use a swivel adapter or swivel socket to remove some of the spark plugs.



A tool that saves me a lot of time and trouble when dropping small parts into the engine bay is the IMPELTronics Magnetic Extensible LED flash light. It telescopes and has a strong magnet at each end:



Here is a MotorWeek review of it: <https://www.youtube.com/watch?v=UKITB6LBhRw>

Installation

In general installation is the reverse of the removal process, however, below are some things to note.

1. I used **Bosch ZR 6 SII 3320** spark plugs which are the OEM replacement parts for **Mercedes A0041596403** spark plugs. The Mercedes branded plugs are about double the price of the Bosch plugs. The plugs come pre-gapped at **0.7 mm**.
2. Before installing the **ignition coils** be sure to apply spark plug connector grease (I used **Permatex Dielectric Tune-Up Grease**) to the inside of the bottom of the coil's spark plug connector as mentioned in the Mercedes Star Bulletin shown below:



Date: February 9, 2015
 Order No.: S-B-15.10/74
 Group: 15

SUBJECT: Engines 104, 111, 112, 113, 119, 120, 133, 137, 152, 155, 156, 157, 159, 166, 266, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 285
Spark Plug Connector Grease

To reduce the force required to plug or unplug the spark plug connector, apply grease before installing the spark plug connector. Otherwise, the spark plug connector may be damaged when it is removed at another time. Other greases are not permitted. Apply approximately one gram of the spark plug connector grease uniformly into the spark plug connector as shown in the Figure 1.



Figure 1. Applying grease. P15.10-2553-02

Parts Information

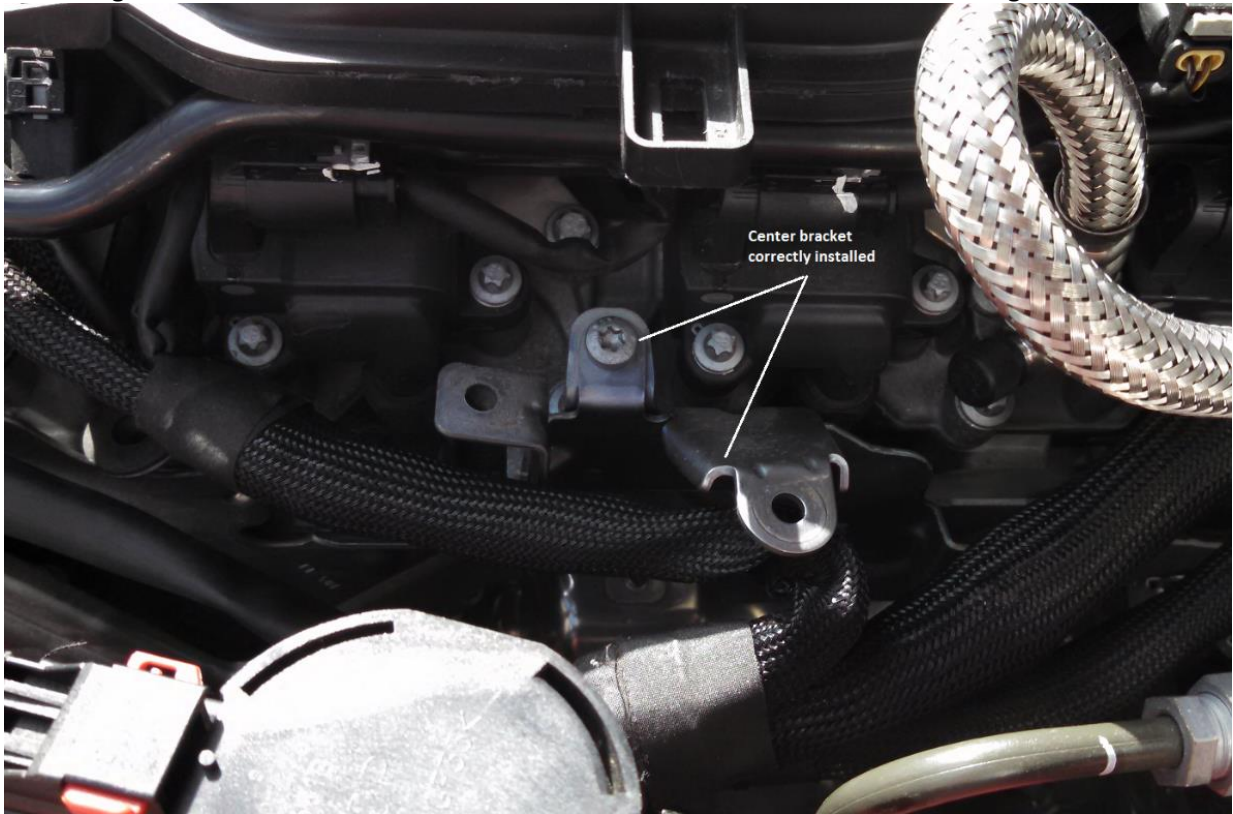
Qty.	Part Name	Part Number
1	Spark plug connector grease	A 002 989 80 51

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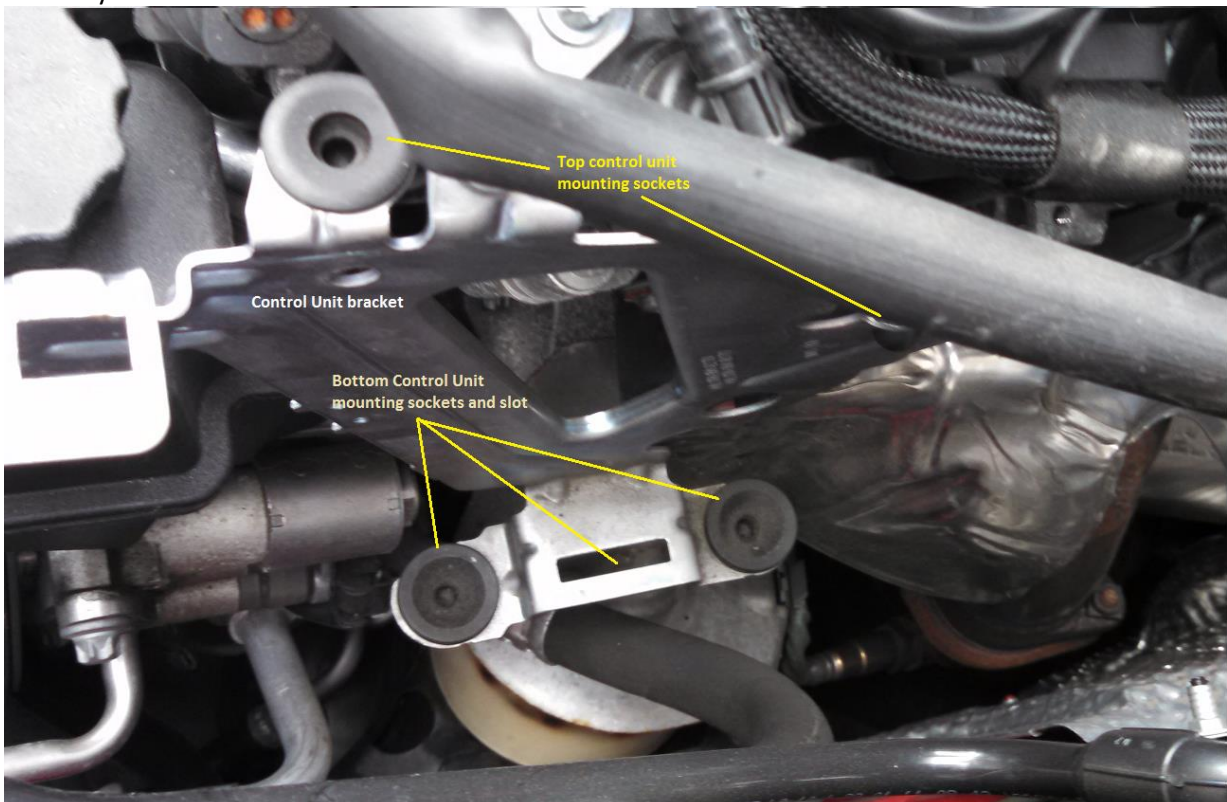
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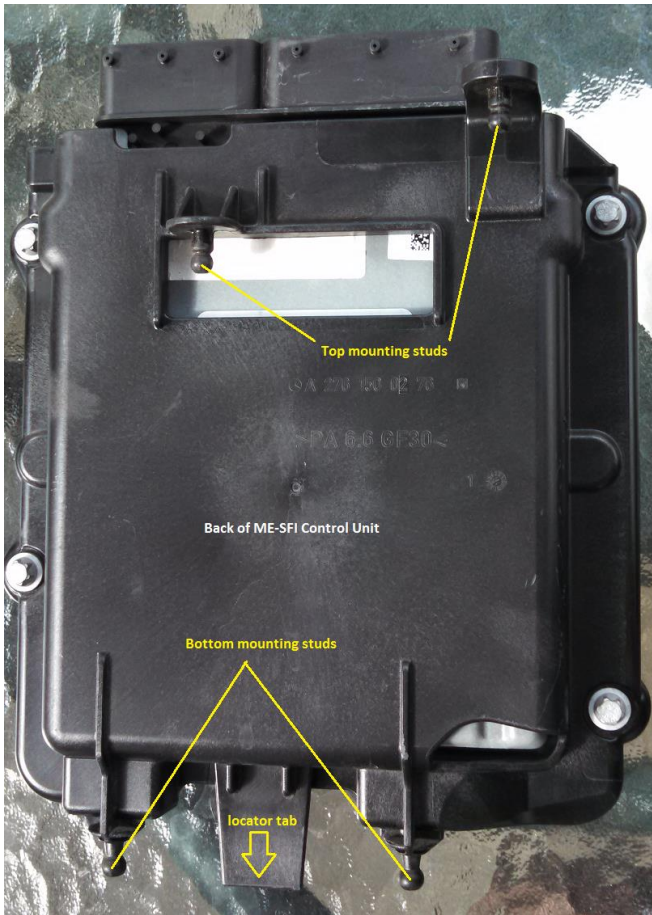
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 1-800-FOR-MERcedes

3. Don't forget to re-install the center section back on the Control Unit's main mounting bracket:



4. When installing the ME-SFI Control Unit be sure it is mounted correctly in its mounting bracket. The unit has **four mounting studs** and **one locator tab** on its back. Make sure that the unit's **locator tab** is pushed into the bracket's bottom slot. Then push the unit's four studs down into the bracket's four sockets. There should not be any movement at the top or bottom of the unit if it is installed correctly.





5. After connecting the **F** and **M** wiring connectors to the **ME Control Unit** sockets make sure that their release clips are pushed all the way in. Pushing the **F** connector down into the control unit socket automatically pushes in its clip. However, the **M** connector requires its clip to be manually pushed fully home. Be sure to push the **F** connector wiring tie-down back into the center bracket hole.

