**BMS POWER BOX****Tools required:**

8mm socket

Small flat head screwdriver

Electrical tape or blue masking tape

The PBX install is broken in to two distinct parts. The first is accessing the ECU, which requires removing plastic panels and covers. The second involves extracting 7 factory wiring pins and replacing them with corresponding PBX pins.

To start lock and close doors and trunk, and wait 10 minutes for the ECU to go to sleep. If you have comfort access place keys inside the house to avoid waking up ECU. Do not open the doors or unlock the car while the ECU connectors or JB3 control box are unplugged as this may trigger a check engine light. Alternatively you may disconnect the negative battery terminal but it is not required if you follow the above procedure. If you do disconnect the battery, don't close the trunk as you'll have a hard time opening it with the spare key in the FOB.

1) Access the ECU area and remove the ECU connectors. If you have a 528i please skip to step 3b.

128i/328i Reference Picture:



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Remove the left and right plastic covers as shown with green arrows. Pull the rubber tab down, and use your fingers to snap each cover off. Place them out of the way.



Pulling cover away:



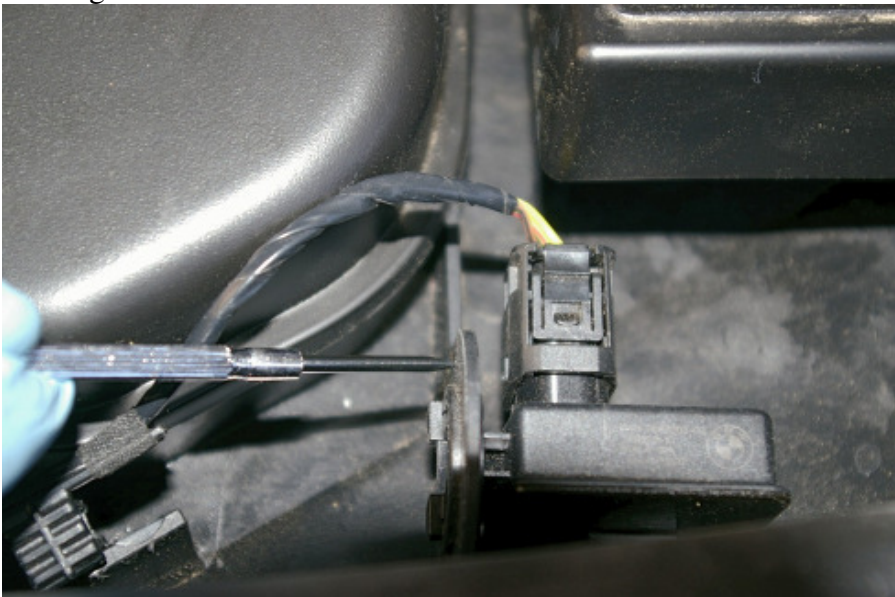
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Remove the left and right sensor/harness as shown in purple. The left sensor removes by pushing in a small clip and rotating, while the right sensor lifts off. Pull the tabs holding the wires out by grasping the tabs and pulling towards you. The sensors will stay connected to the wires, just lay the sensors and wires towards the front of the engine out of the way. In some vehicles the driver side sensor is not mounted on the cowl and thus does not need to be removed.

Driver side sensor:



Passenger side sensor:



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Remove the six 8mm bolts holding down the HVAC air filter (shown in orange) and pull off the filter. Place it on the ground out of the way.

Remove the two 8mm machine bolts shown in blue. These hold down the plastic cowl that we will be removing. There are two rubber tabs on the left and right of the cowl that must be pulled out, as well as a wash fluid line on the left side.

Using a flat head screwdriver, push down the clips and pull forward the plastic rail holding the battery cable as shown. This will remain in the car when the cowl is removed.



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Next use the flat head screwdriver to release the cable bundle running right behind the power strip you just removed. Pull the cable forward while lifting up the cowl to release it. The cowl should now lift out of the engine bay. Place it on the ground out of the way.



When removing and installing cowl, do so at a 45 degree angle. Tabs on the rear of the cowl must slide under the weather stripping to properly lock in place.

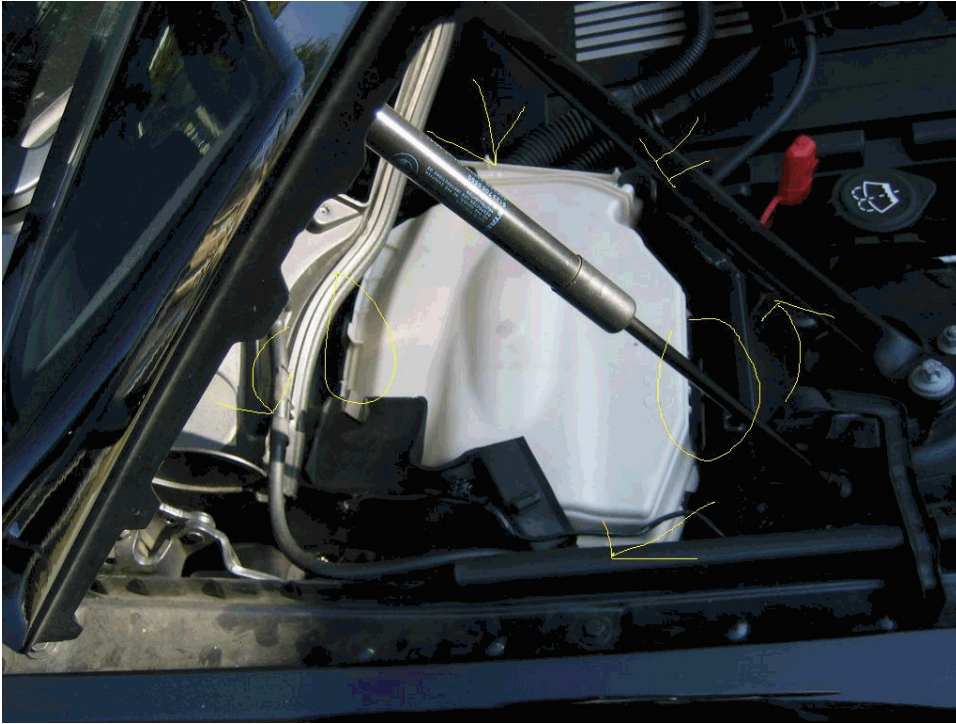


Once the cowl is removed your engine bay should look like this:



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Finally remove the left yellow plastic cover to expose the ECU. It is held down by two sliding clips on the sides, and four small plastic clips on the front and back. Unlock the sliders then use your fingers to reach under the clips on each corner and unlock.



Exposed ECU:

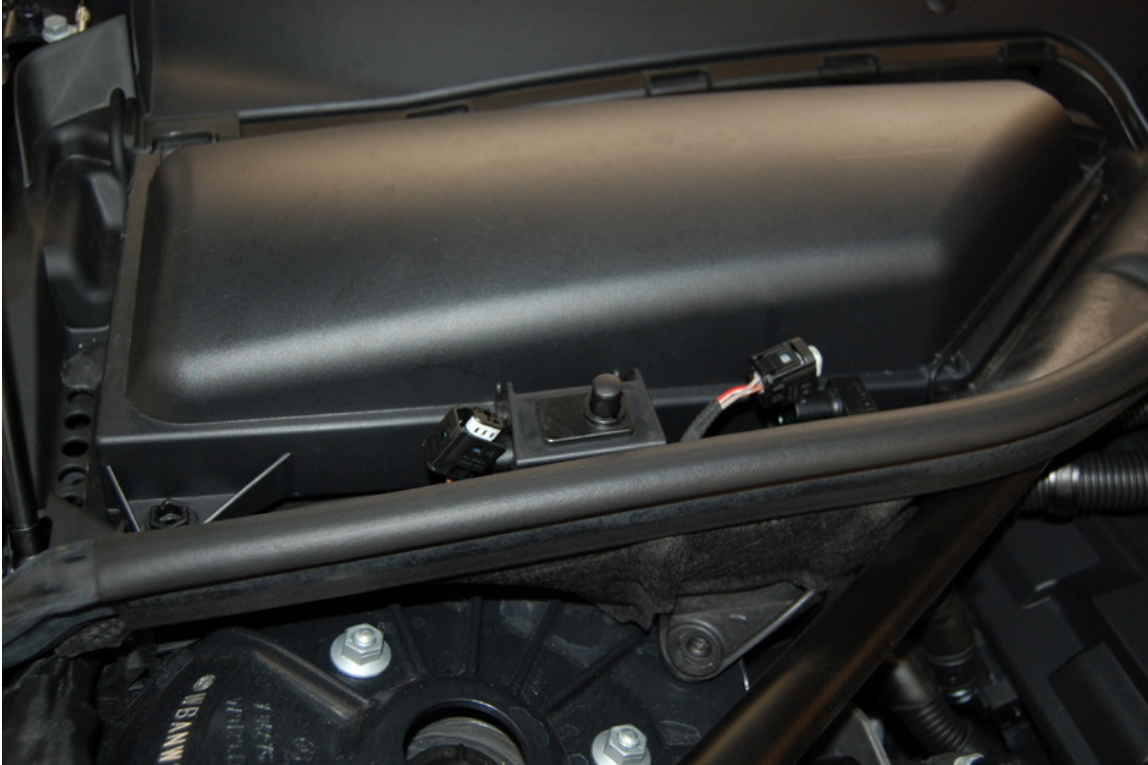


3b. 528i ECU access. All others skip ahead to page 16.

528i Reference Picture:



Disconnect the two sensors located by the HVAC filter as shown.



Use a 12mm socket unlock the plastic bolt by gently turning it 1/4 turn, and then release the metal latch holding it down.



The filter should lift up and out as shown.



Pull off the weather stripping by pulling straight up and away until it has cleared the left tray, or about half way across the engine.



Remove the slider as shown by lifting the clip and sliding towards the driver side.



Release the left side tray by rotating the 4 plastic retaining bolts 1/4 turn.



Lift away the rubber guard as shown.



Remove the t25 torx screw holding the tray to the shock tower.



Finally slide the tray towards the fender, up, and out.



Use an Allen wrench to remove the 5 screws holding down the ECU cover.



Release the sliding lock in the back of the box, and remove the lid.



Finally, 528i ECU access!



4) All models:

Once you have access to the DME you'll remove the left (larger) connector. To do this you pull the slider (triangle shaped handle) to the left, which will release the connector and allow you to lift it up and away from the ECU.

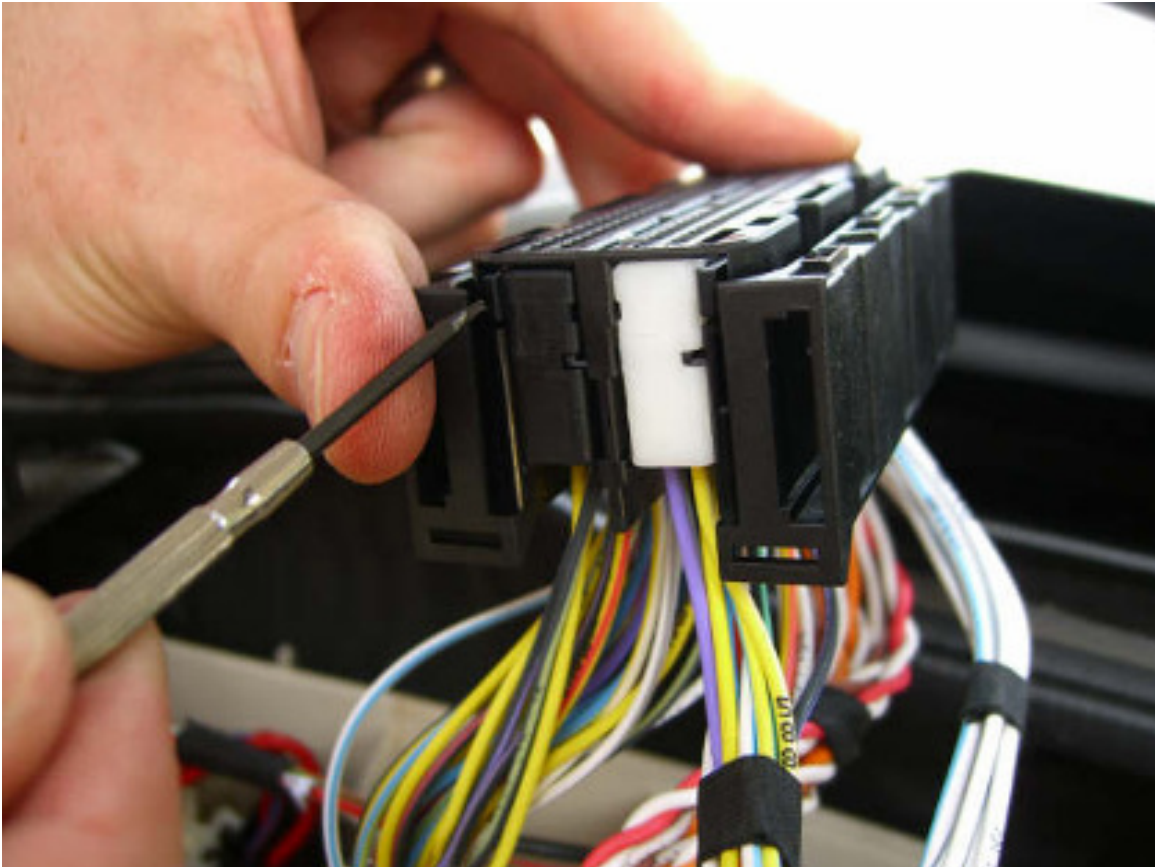
Large Slider pulled out



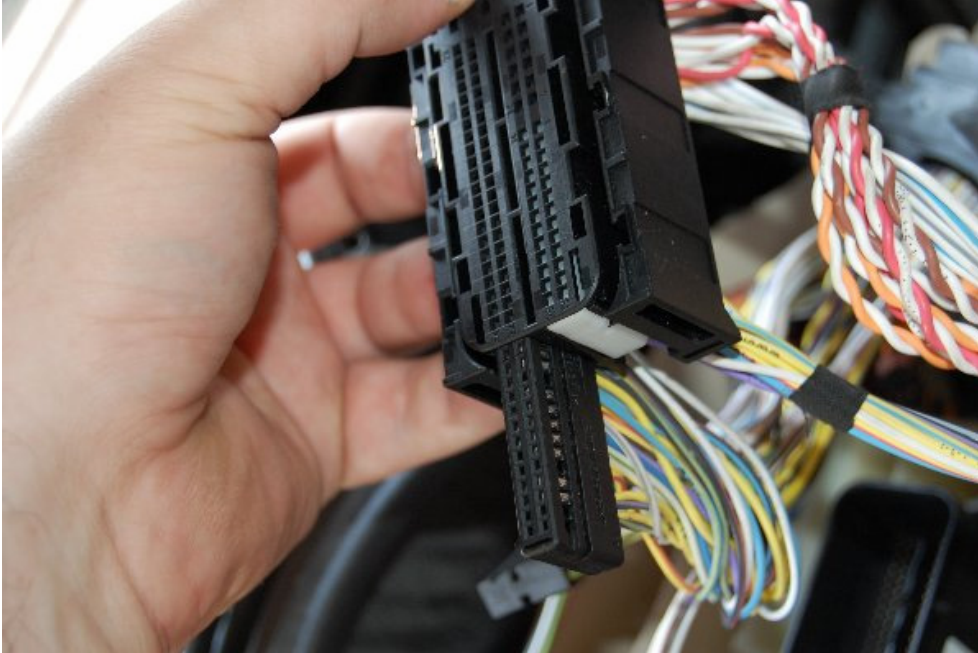
Large ECU connector removed for reference



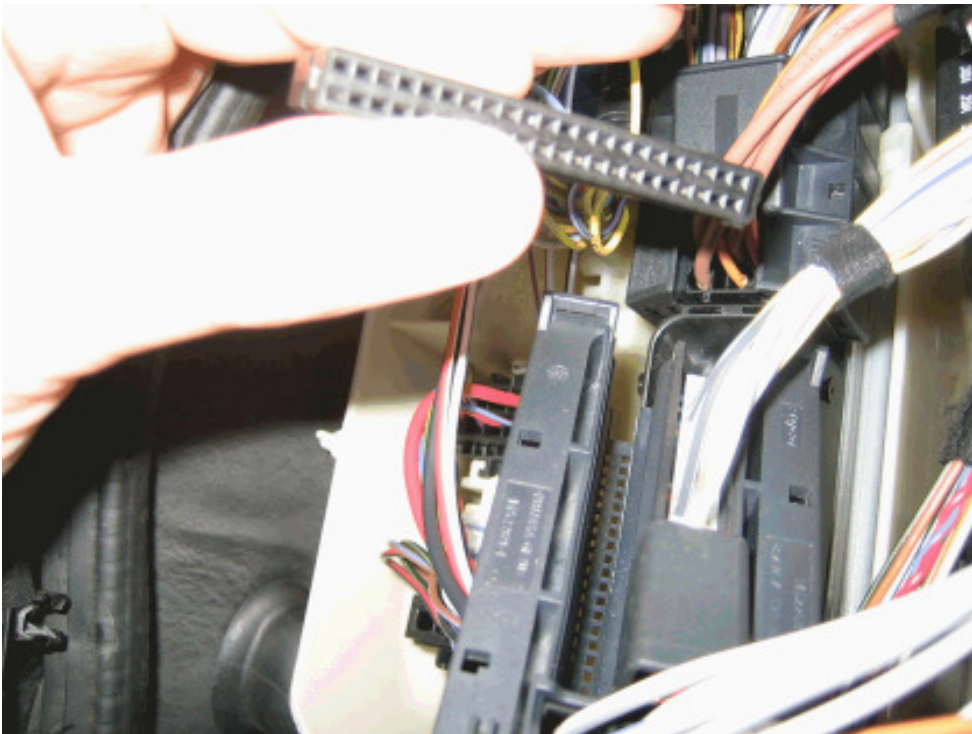
Each connector contains two subconnectors. Black and white on the left larger subconnector you just removed, and black and grey on smaller right side subconnector. Slide out the large black subconnector by using a small screwdriver to hold back the retaining clip as shown, and tugging on the wire bundle gently to slide the connector out as shown.



Large black subconnector sliding out



Large black subconnector once removed



Note that each subconnector is numbered. The large black subconnector is labeled 1 - 22 on one side, and 23 - 44 on the opposite side. The smaller subconnectors are each labeled 1-13 on one side, and 14-26 on the other side. Following this number system is critical in ensuring your extract and insert the PBX wires in the appropriate slots.

Locate the #29 position on the large black subconnector, which is a solid yellow wire. Using a small screwdriver gently push in the retaining clip while tugging the wire. The wire will slide out approx 1/4" and then you will need to push the retaining clip in again to free the wire completely.

Slide the PBX white wire with female pin in the #29 slot until it clicks in to place.

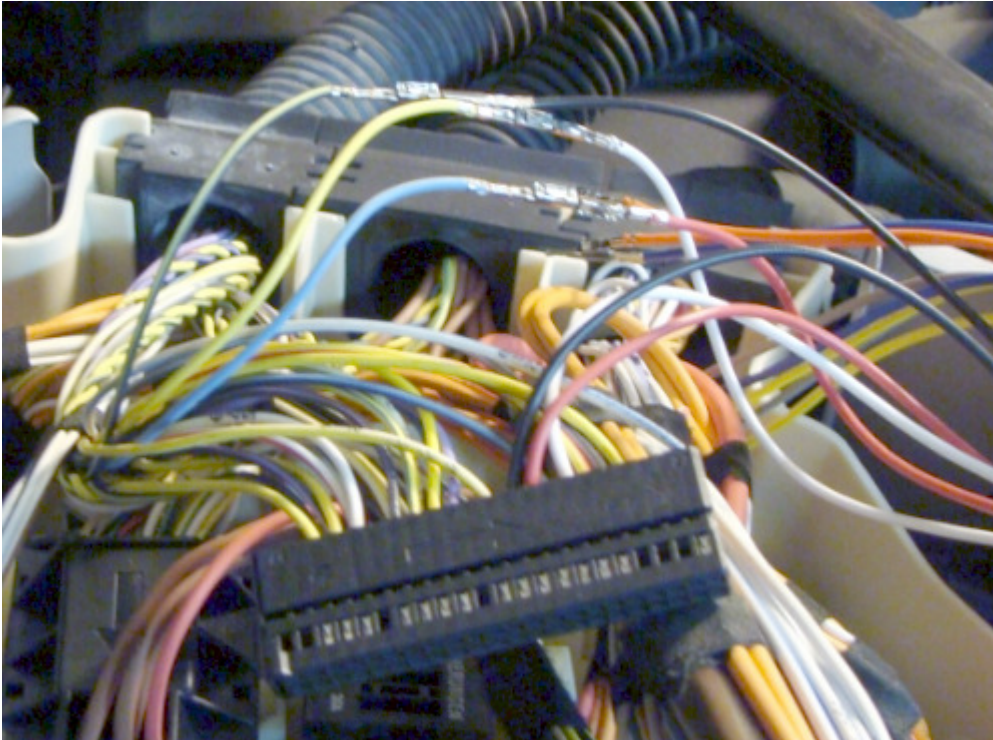
Insert the yellow wire you just removed in to the PBX white female wire, completing the loop. Making a good connection is very important so make sure the male pin is fully inserted. It often helps to insert the pin at an angle to provide a more snug fit. You may need to insert and remove the male pin several times to get a good solid fit.

Fold a piece of electrical tape or heavy duty masking tape over the exposed male/female connection ensuring they are fully seated and secured under the tape. Do not attempt to wrap tape around the connector as this has proven to be unreliable. Simply fold the tape in half along the wire pressing together with your fingers as shown. .

Example of pin being removed/inserted:



Large black subconnector PBX white, red, and black wires inserted:



Large black subconnector tape folded over exposed pins:



Repeat the same process for the remaining black and red wires below:

PBX white - pin 29 (yellow wire) (you did this one above)

PBX red - pin 31 (blue yellow)

PBX black - pin 32 (black yellow)

Upon completion of the large black subconnector, reinstall it in the large ECU connector, and reattach the connector to the ECU. Take care to ensure you do not knock any of the wiring loose while doing so.

To install the connector on the ECU pull the slider all the way out (1-1.5"), center the connector over the ECU, and push the slider in. When properly aligned pushing the slider in will suck the ECU connector down in to place. If not perfectly aligned the slider will not slide in, so pull it in and out and wiggle around the connector.

This is one of the trickiest parts of the install process, but once you understand how it goes together is rather simple. So if you are having a hard time getting the connector in keep at it. You can also review the JB3 PnP video at www.burgertuning.com which shows this step.

If all else fails, you may lift the ECU up and out of its plastic holder several inches giving you more room to work.

Remove the small right side ECU connector the same way as the larger side connector, by pulling the slider out. The small ECU connector contains a small black and small gray subconnector.

To remove the subconnectors from the smaller ECU connector you must first remove the slider itself. Push in on the retaining clips on the top of the connector as shown while pulling the slider out.

Removing the slider from the smaller driver side subconnector



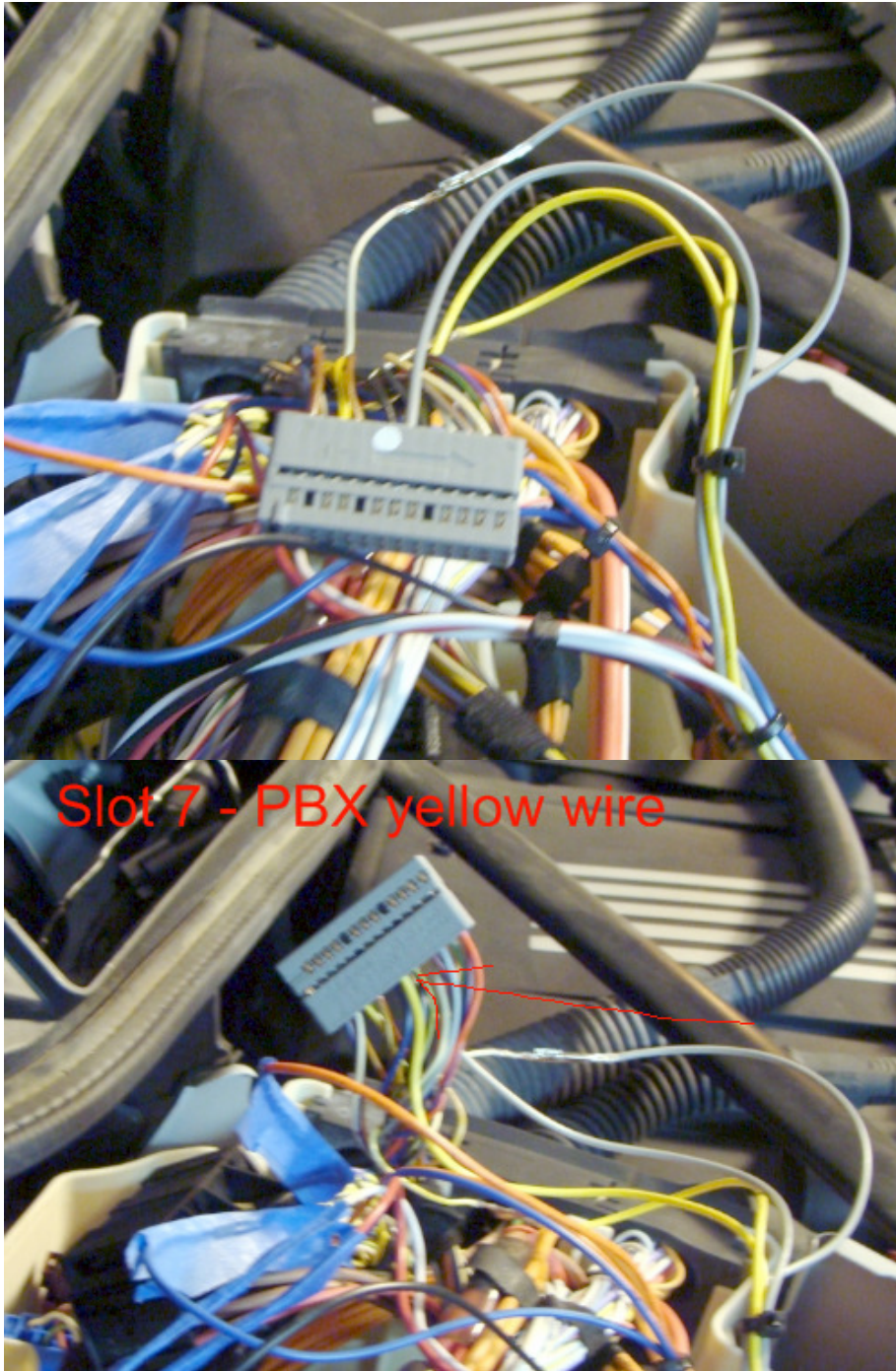
Extract the black and gray subconnectors, and insert the PBX wires as indicated. Be sure to match up the wire color and number and only do one wire at a time to avoid confusion. The black and gray subconnector will only slide back in one way.

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Small gray subconnector:

PBX yellow - pin 7 (white)

PBX gray - pin 20 (white)

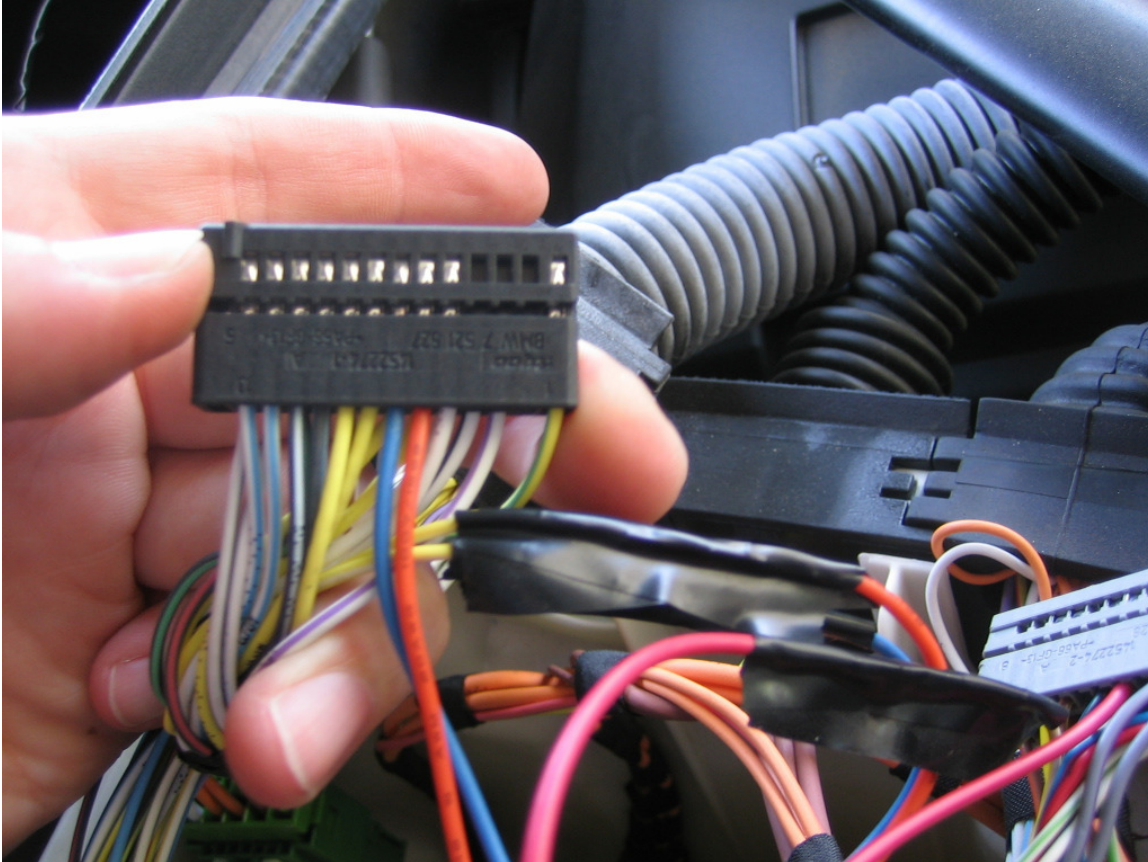


Small black subconnector:

PBX orange - pin 6 (yellow with white stripe)

PBX blue - pin 7 (yellow with white stripe)

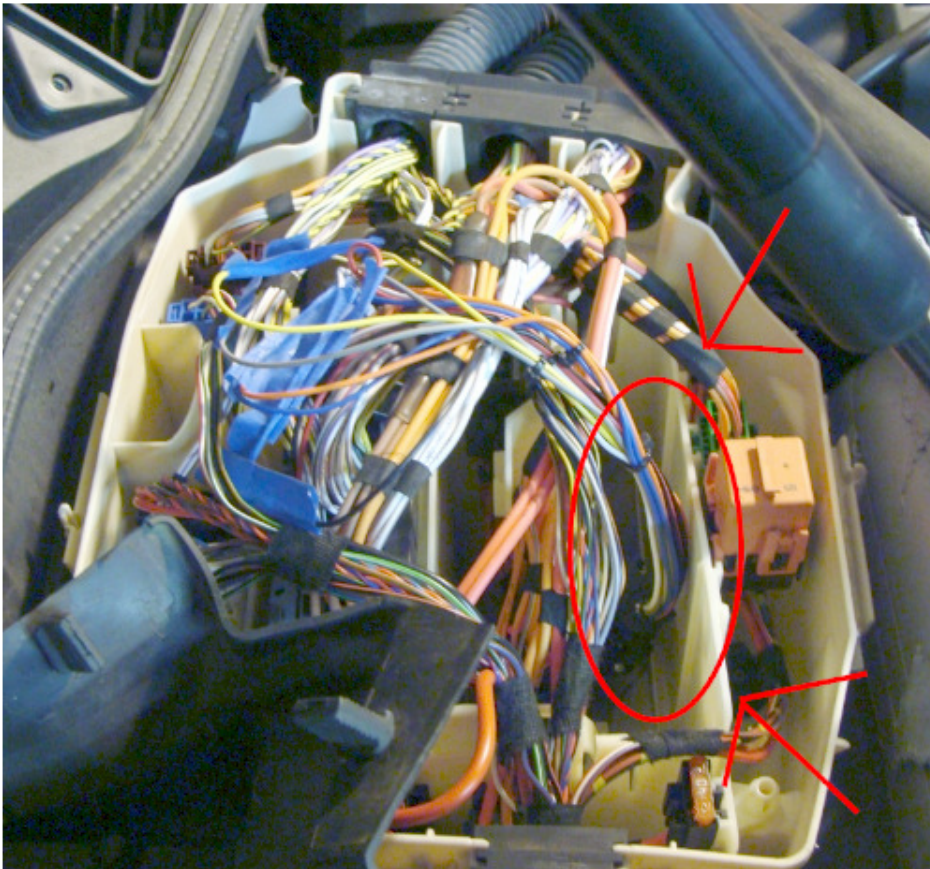
Photo of small black subconnector with PBX loom installed:



Reinsert the small black and gray subconnectors, insert the slider, and reinstall the smaller connector to the ECU. Center the connector and push the slider in to suck the connector down to the ECU.

5) Attach the PBX to the harness, and secure the two screws. Position the PBX in an empty tray in the ECU.





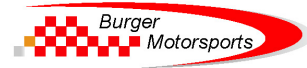
Arrange the wires so that they are flat and tucked out of the way. You don't want them to come loose when reinstalling the yellow ECU cover. Use the above photo as a reference.

Reinstall the plastic yellow ECU cover. It helps to push the four clips up before centering the cover over the ECU area. You will then sandwich the cover between the strut tower brace and the ECU area centering it, push the clips down, and finally lock the sliders. Expect this to take you a few minutes the first time until you get a feel for it.

6) **If you disconnected the battery** reconnect the negative battery terminal. Upon first starting the car you will have a clock warning (triangle with ! in the middle of it). All wheel drive (Xi) models may also have a DTS/DTC warning message, which will turn itself off after a short drive. It is also not uncommon to have to set the clock 2 or 3 times before it saves.

7) Before reinstalling cowl and remaining covers start the car and rev it a few times. If it fails to start, takes a long time to start, shows a picture of a half yellow engine in the dash (CEL), an orange service engine soon light (SES), does not accelerate, or runs extremely rough, please refer to the troubleshooting guide below.

Assuming all is well reinstall the cowl, filter, and related parts. Installation is the opposite of removal.



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Congratulations, installation is complete! It will take a day or two for the ECU to adapt to the new tune, so drive as you normally would and the car will gradually pickup power as time passes. By default map 3 is selected.

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Map switching directions:

Insert keyfob and press start button to turn ignition on (lights on dash, but engine not running). Press and hold the gas pedal down to the floor for 4 or more seconds, and then release pedal. This puts the PBX in to listen mode. If you start the engine at this point you will be on map 0. For performance maps press the gas pedal to the floor and quickly release one time for each map you would like to select. For example for map 3 press and release the gas 3 times, and start the engine. Your map setting will be saved until changed. If you forget what map you are on, turn engine off and reset the map selection. When burning a chip map 3 is always selected by default.

Map Guide for PBX

Map 0: --Disables PBX, all signals pass through

Map 1: --30% throttle remapping, performance tuning on

Map 2: --60% throttle remapping, performance tuning on

Map 3: --100% throttle remapping, performance tuning on

Map 4: --30% throttle remapping, performance tuning off

Map 5: --60% throttle remapping, performance tuning off

Map 6: --100% throttle remapping, performance tuning off

Map 7: -- Throttle remapping disabled, performance tuning on

Troubleshooting Guide

Troubleshooting is broken in to two distinct groups. The first are issues that come up during installation, like failure to start, yellow engine light (CEL) upon first start, etc. The second are issues that arise after the tuner has been installed and working properly for some time.

This guide deals only with installation related issues. But should you ever experience a yellow engine light (CEL) or service engine soon code (SES), you should email BMS directly at **terenceburger@gmail.com** for technical advice. We have seen it all and can quickly help you determine whether or not the issue is related to the JB3 and what to do next. We encourage customers NOT to make pleas for help on internet forums as more often than not they receive incorrect or bad information. By purchasing a tuner from BMS you have paid for support, so feel free to use it!

Common installation problems:

Engine cranks and cranks but will not start:

Cause 1) One or both ECU connectors are not fully seated. They can be tricky to get in but when done properly the connector will seat itself as you are pushing the slider in. Remove connectors and try again until you are positive they are fully seated.

Cause 2) One of the wires is installed in the wrong slot or has become unplugged under the tape. Recheck each carefully verifying the wire color and connector position.

Engine starts but has a big yellow check engine light showing (CEL):

Cause 1) PBX control box not plugged in.

Cause 2) One of the wires is installed in the wrong slot or has become unplugged under the tape. Recheck each carefully verifying the wire color and connector position. The PBX alters throttle position sensor wires and if a wire comes loose or is not making a good contact the ECU will revert to a low throttle safety map, preventing you from accelerating.

Engine starts but an orange "Service Engine Soon" (SES) light appears

Cause 1) During the installation process you had some issue that you have since corrected, but the SES light is still on. The code will turn itself off after a couple days of driving, but it is suggested you borrow or purchase a CAN BUS OBDII code reader from Autozone or a local auto parts store to read/delete the code. Always read/delete codes with the ignition on / engine off. If the code reappears contact us with the code number for further instruction.

Cause 2) One of the wires is installed in the wrong slot or has become unplugged under the tape. Recheck each carefully verifying the wire color and connector position.