

“Bluetooth DSP-5 switch”

Installation instructions, 2004.5-2005 LLY Duramax

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Thank you for purchasing the BT DieselWorks Bluetooth DSP-5 switch! The original smartphone-controlled Bluetooth DSP-5 switch for 2001-2010 Duramax Diesel trucks with EFILive DSP-5 tunes installed. **This instruction manual covers 2006-2010 LBZ/LMM trucks only. See other documents for 2004.5-2005 LLY, or 2001-2004 LB7.**

The Bluetooth DSP-5 switch is functionally identical to the old mechanical switches in that it offers the same instant switch-on-the-fly capability, however the obvious difference is that the mechanical rotary-knob-switch is replaced by an App on your smartphone, and the phone links with the truck wirelessly using Bluetooth 4.0/Smart connectivity.

DISCLAIMER: Ben Tyler or BT DieselWorks, LLC will not be held responsible for any personal, property, truck, vehicle, engine/powertrain, or transmission damage/injury that may result with the use of this module. This is an aftermarket part; just like any other aftermarket performance truck parts, install/use it at your own risk. Be sure to use caution when working around yellow connectors or wiring as these can be related to the SIR (airbag) system.

If yours does not work for some reason, email us and we will correct the situation. This is, of course, provided you do not have an existing mechanical/electrical problem with your truck/transmission that is outside of my control or the module's abilities. IE, if you have a bad ground, bad wiring, incorrect ECM programming, ECM pin is not seated fully in the connector, etc, this module obviously will not be able to function properly.

The Bluetooth DSP-5 switch modules are covered by a 1-year warranty. If the module 'stops working' for some reason and you have diagnosed the problem and eliminated wiring problems/blown fuses/flasher module as a problem source, send the module back to us. We will test the module and if it is indeed found to be defective/failed, we will replace or repair the module free of charge (minus shipping costs). **If we receive the module back and see that it has been modified, tampered with, water-damaged, wired incorrectly, opened, or physically damaged, the warranty is VOID.** If the module does incur damage that would normally not be covered by warranty, let us know and we can most likely repair it for substantially less than the cost of a whole new module. If you have any questions regarding the warranty or module repair, feel free to contact us.

Installation Procedure

1. Disconnect both batteries.
2. Decide where you are going to mount the Bluetooth DSP-5 switch. Only the PINK, BLACK, and PURPLE wires from the DSP-5 switch will have to be run out to the ECM in the engine compartment. The GRAY and WHITE wires are currently unused with the Bluetooth DSP-5 switch, however they will be used for future features, so do NOT cut them short. Tape them up securely so they do not touch each other or touch any other wires/surfaces under the dash.

3. Secure the Bluetooth DSP-5 switch in a safe place under the dash using zip ties or double-sided tape. Be sure that it is clear of any moving steering/pedal linkage and mounted securely.
4. Disconnect the BLACK (C2) ECM connector, and the GRAY (C3) ECM connector. Carefully remove the black plastic wire dressing covers on both ECM connectors using a small screwdriver. Then carefully remove the green slide-in pin retainers on the sides of the ECM connectors. **As a visual guide, you can follow the “DSP-5 switch install tutorial” guide in EFILive for a description of how to disassemble the ECM connectors and install the pins for your specific truck. LB7, LLY, and LBZ/LMM all have different styles of connectors and pin locations, so be sure that you install the pin in the proper location for your generation of Duramax.** If you accidentally lose or damage the ECM pin retainers, we sell replacements.
5. **NOTE: If you already have an existing DSP-5 switch, please skip step 6 and go to step 7.**
6. Start with the GRAY (C3) connector. **Carefully insert the PURPLE wire/pin from the DSP-5 switch into pin position 32, next to orange/black and red/black wires. (this is the “DSP-5 signal” pin)** Be sure not to bend the pin or wire. **NOTE:** If you already have an existing DSP-5 switch, there will already be a pin/wire in this position. You will have to remove that existing pin (or cut/re-splice the wire) from your old DSP-5 switch, and insert the new pin/wire from your new digital DSP-5 switch. Skip to step 9.
7. **OPTIONAL: If you want to retain your old DSP-5 switch in addition to the Bluetooth DSP-5 switch, follow step 8. You do NOT have to keep both switches, you can run just the Bluetooth DSP-5 switch if you choose. However it may be desirable to keep the old existing DSP-5 switch wired up as a “backup” in the event that your phone gets lost or has a dead battery. A nice solution is to relocate the existing DSP-5 switch under the dash so it is hidden from sight, but can still be reached if your phone is lost/dead. If you are removing your old DSP-5 switch completely, go to step 6.**
8. **If you are keeping your existing DSP-5 switch wired up as a backup,** locate the wire from the old DSP-5 switch that goes to the “DSP SIGNAL PIN” on the ECM, Pin 32 on the GRAY (C3) connector. Trace that wire back to the interior of the truck. It will end at the old DSP-5 switch. Cut that wire about 20” from the old DSP-5 switch itself. Find a suitable mounting location for the small toggle switch that is included with the Bluetooth DSP-5 switch. Splice the wire that goes out to the ECM (pin 32) to the MIDDLE terminal of the toggle switch. Splice the other side of the wire that you cut (the wire that goes to the old DSP-5 switch) to one of the outer terminals on the toggle switch (does not matter which side). Now, take the purple wire from the Bluetooth DSP-5 switch, and splice it to the other outer terminal on the toggle switch. Secure the connections (soldering is highly recommended) and be sure to use tape or heat-shrink tubing to protect the wires from shorting out or becoming loose. Now this toggle switch will be used to select between the old DSP-5 switch, and the new Bluetooth switch. **You can flip the switch to alternate between Bluetooth and standard DSP-5 at any time, however USE CAUTION if you have any of your tunes setup as something non-standard (IE, valet, no-start, nitrous, high-idle, etc)...as flipping the switch could make the truck suddenly jump to a different tune, depending on what setting the alternate switch was last left on.**
9. Reassemble the GRAY (C3) ECM connector. Slide the green plastic pin retainer back in and be sure it is fully inserted. If it binds up and does not slide in easily, a pin is not properly seated! Replace the black plastic wire dress cover.
10. On the BLACK (C2) ECM connector, **Carefully insert the PINK wire/pin from the DSP-5 switch into pin position 12, next to a black wire. (this is the “DSP-5 power” pin)** Be sure not to bend the pin or wire. **There should be NO existing wire in this pin position.**

11. Reassemble the BLACK (C2) ECM connector. Slide the green plastic pin retainer back in and be sure it is fully inserted. If it binds up and does not slide in easily, a pin is not properly seated! Replace the black plastic wire dress cover.
12. Reinstall the ECM, reconnect both ECM connectors and slide the locks into place.
13. **Carefully route the three PINK, PURPLE, BLACK wires so they are secured (zip ties are recommended) far away from any moving parts, belts, pulleys, exhaust manifolds, hot surfaces, or anything else that may potentially damage the wires. It is highly recommended to run the wiring through protective plastic wire loom as well. Take extra care of where the wires run through the firewall as well, making sure they will not rub/chaff on sharp metal surfaces.**
14. **On the interior, carefully secure the wires under the dash away from any brake pedal linkage, accelerator pedal parts, and steering column moving parts. Also be sure to protect the wires from any sharp metal surfaces, such as dash brackets/braces..**
15. After securing all wiring, double-check all connections, plug the DSP-5 harness connector into the back of the DSP-5 switch, and mount the DSP-5 switch in its final mounting location..
16. Reconnect batteries.
17. Now comes the fun part! Follow the link <https://appsto.re/us/7-6w7.1> to find the BT DieselWorks Bluetooth DSP-5 controller app on the iTunes App Store. You can also just search the app store for "DSP-5" "BT DieselWorks", etc. Your phone must have iOS 7.1 or later to run the app.
18. Download the app and install it on your phone. Be sure that Bluetooth is turned "on" in your iPhone settings.
19. With the truck running, open up the BT DieselWorks app, and click the red "Connect" button in the lower left corner of the screen. Within 1-2 seconds, the "Connect" button should turn green, indicating that your phone is successfully connected to your truck! At the same time, the DSP-5 Tune list will then turn blue, and the current DSP-5 tune mode will be highlighted. Click the various buttons to change DSP-5 tune. Tune changes are instantaneous as soon as you click the button, same as a traditional DSP-5 switch.
20. The wireless range on the Bluetooth DSP-5 switch is roughly 100-125 feet, depending on various conditions. If your phone loses connection with the truck (if you walk far away from the truck with it running, etc), the "Connect" button will turn red, and the DSP-5 tune buttons will become grayed out. The truck will still remain in the current DSP-5 tune. To re-sync the phone if it loses connection, make sure you are within range of the truck, and simply press the "Connect" button again. The Connect button will then turn green again, indicating you have successfully reconnected with the truck.
21. If the truck is turned off, the app will disconnect, and you will have to reconnect again next time you start the truck. When the truck is turned off, the switch will automatically restart in the same DSP-5 tune that it was left in the last time the truck was shut off, regardless of whether you reconnect your phone or not. In other words, the switch will only change tunes if the app is connected and specifically tells it to...otherwise, it will just stay in the same tune it was last set to.
22. If you wish to custom-label your tunes, click the "configure" button in the lower right corner of the App, and then click the DSP-5 tune label that you wish to change. A text window will pop up, allowing you to rename the button. If you forgot which button corresponds to which exact tune in EFILive, you can press the "reset" button in the upper right corner to clear your custom tune names and set the labels back to stock.

23. Turn the truck off and re-check all connections/wires/fitment.
24. **Finished! Enjoy your BT DieselWorks Bluetooth DSP-5 switch and App!**

Troubleshooting Guide

1. If the switch does not light up or do anything with the key turned on, then the switch is not getting power or ground. Double check that the ECM connectors are fully seated/latched, and the pins are fully seated in the ECM connectors. The #1 cause of DSP-5 switch problems is with incorrectly inserted/not fully-seated pins in the ECM connectors.
2. If the app connects properly and appears to work properly, but does not actually change tunes, the problem is most likely due to the pin in the ECM connector not being fully seated, or the pin was installed in the wrong position altogether. If the pin is verified in the proper position, and the pin is verified to be fully seated, you can use the EFILive scan tool to check what voltages the switch is sending to the ECM. Start the engine. Open up the EFILive scan tool, connect to the truck, and look for the "DSP5 TUNE" and "DSP5 SWITCH VOLTAGE" PIDs. Log those PIDs and verify that the voltage and tune level changes with when change tunes on the App. **The APPROXIMATE voltage reading should cycle from 4.6 volts, 3.5 volts, 2.4 volts, 1.5 volts, 0.5 volts, as the switch is cycled up and down from tune 1 through tune 5.** If the voltage does not change, is erratic/jumps around, or stays at 0.00v or 5.00v, check the wiring and make sure the pin is not damaged. If the voltage changes, but reads incorrectly, double check that you have the switch configured for "2001-2005 LB7/LLY" mode in the App.