



BMW E46 convertible AVIN Avant-2 Backup Camera Installation Guide



The e46 convertible is a work of automotive art even as the design has aged since its release. At least for me, the only shortcoming of the design is the view to the rear, especially when backing up. The blind spot behind the e46 convertible, with the top up, is large enough to hide say... the USS Enterprise.

Solution? A color backup camera installed into the rear trim and tied to my Avin Avant-2 stereo deck.

Assumptions:

The example used for this DIY is a 2004 BMW M3 convertible manual transmission with an [Avin Avant-2](#) double DIN stereo deck installed. No doubt other systems will be similar in hook up and the majority of the guide will still work for you even if you don't have the Avin.

Goal:

Install the backup camera as easily as possible, and also with minimal possible disruption to the OEM look of the car. I don't want some camera that stands out or looks terrible and obvious.

Disclaimer:

This process worked for me beautifully but that doesn't mean it will automatically do so for you. Work slowly and carefully, don't force anything and don't rush. For roughly two hours total of time, you can save a significant amount on install costs and have pride in upgrading your car. When in doubt, stop, step back and ask for help if something isn't working.

Lastly... do yourself a favor as you get in and out of your car multiple times: DO NOT put tools in your pocket. It's tempting, but one wrong move and you can punch a screwdriver through your seat. DON'T DO IT.

Lastly: Several of the example pictures may show the original OEM deck or other combinations of equipment. To get this guide out ASAP, some pictures have been recycled from the [Avin install DIY](#), so focus on the steps and not extraneous details.

As you do follow this guide, this is just my attempt to get this work done. I have no doubt there are better/faster/easier ways of doing this work. Feel free to provide feedback on the forums.

Tools:

Must have:

Torx T20 screw driver
Small flat screwdriver
Small Philips (+) screwdriver
medium adjustable pliers
Shop towels
Old plastic credit/club/debit card or piece of thin hard plastic
super glue
electrical tape
socket wrench and sockets

Nice to have:

[Plastic panel removal tool](#)
[Trim clip](#) x 5 (you *will* break these) BMW #51458266814
wire taps x4 (make sure these are HIGH quality as most are crap to my experience esp. in this case)
Locking clamp
Needle nose Pliers
Shop work gloves
Magnetic screw bowl
Lots of light and space
Forum information – [E46 Fanatics Mobile Electronics Forum](#)
[Music](#) (I recommend BB King, nothing like the blues while doing car work)
Patience

Contacts:

[AVINUSA.com](#)

[E46 Fanatics Forum](#)

[E46 Fanatics Mobile Electronics Forum](#)

Installation preparation work

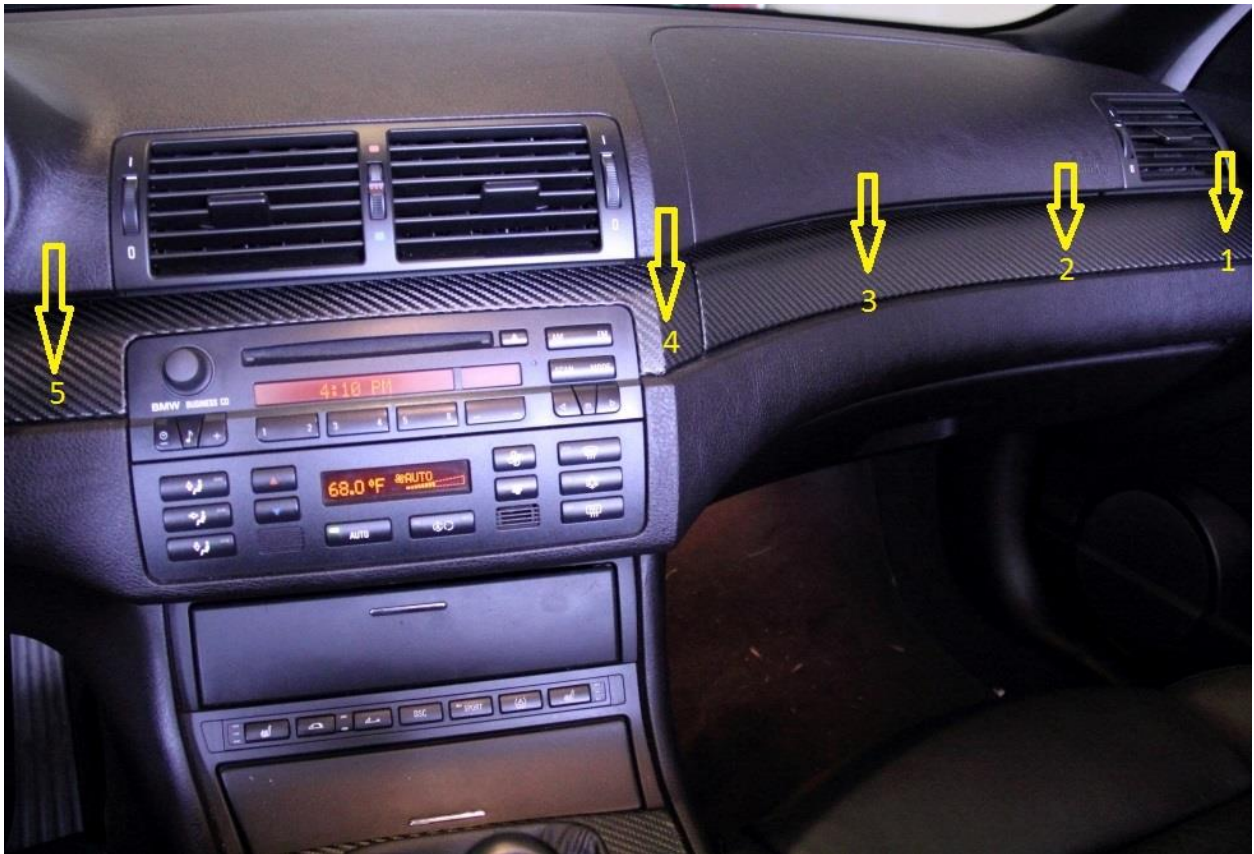
*Assumptions: Ignore the OEM deck shown at times in this stage, as this is about trim removal. You can start at the front or back of the car, direction doesn't matter.

1. Dash trim will need to be removed first, and are held in with a series of 5 attached aluminum pins pushed back into the dash.

Go slowly and carefully as you do this work. The dash itself is soft padded material and *will* dent and tear if you are not careful.

The trim tools are the best option to slowly fulcrum out the pins in the dash and not damage anything along the way. Don't be hasty and make a thousand dollar mistake.





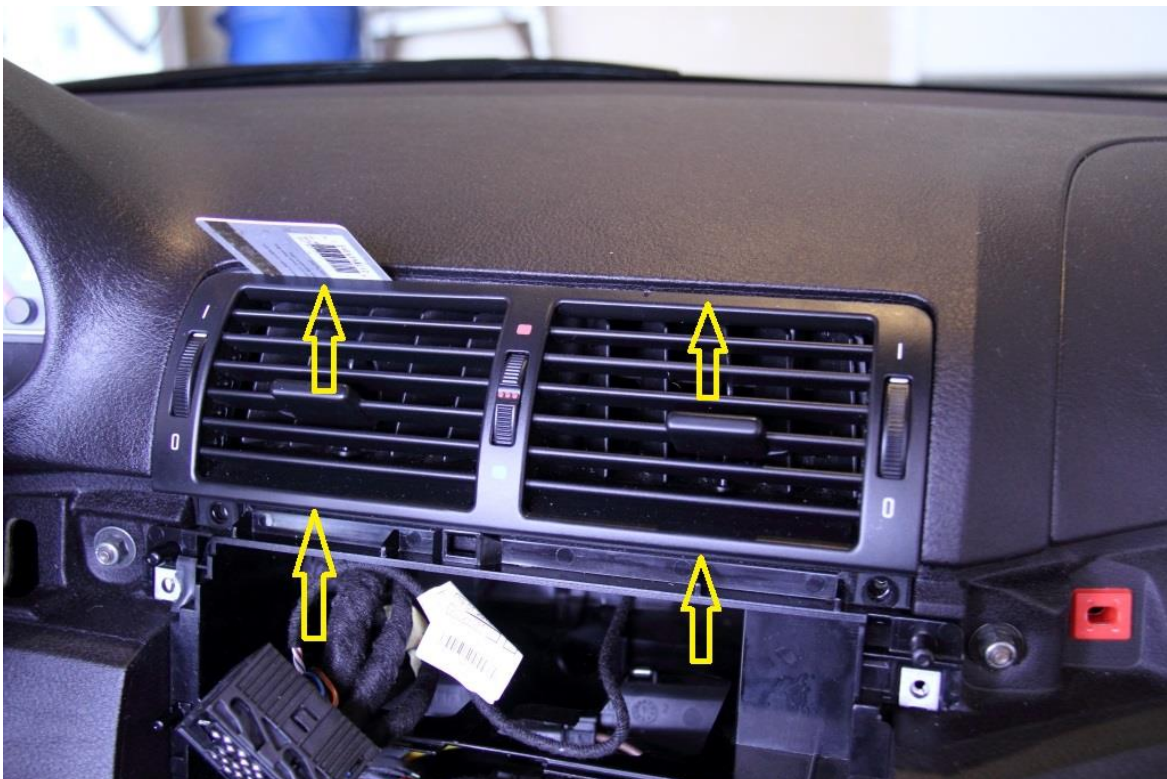
2. Use a flat bladed screwdriver covered with a shop rag, or better, the plastic trim tool to carefully pry up the trim, starting at point 1 slowly prying right to left to point 5.
3. It is not uncommon for the orange trim clips to break or even come out attached still to the aluminum pin on the trim. These will break or will be broken, but are easy to replace.



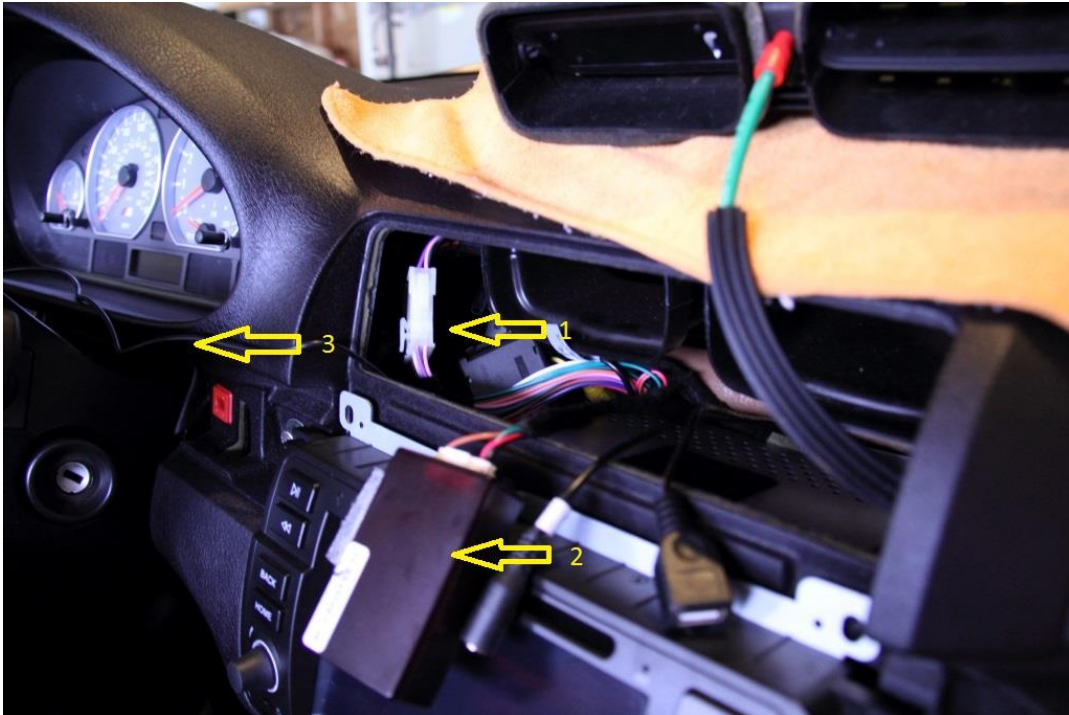
4. Use a pair of needle nose pliers to grip and then remove the trim clips. Turn the clip to a vertical orientation to remove and pull out. Insert the new clip vertically and then turn horizontal to lock into place. The blade of the pliers works well to turn back into place.



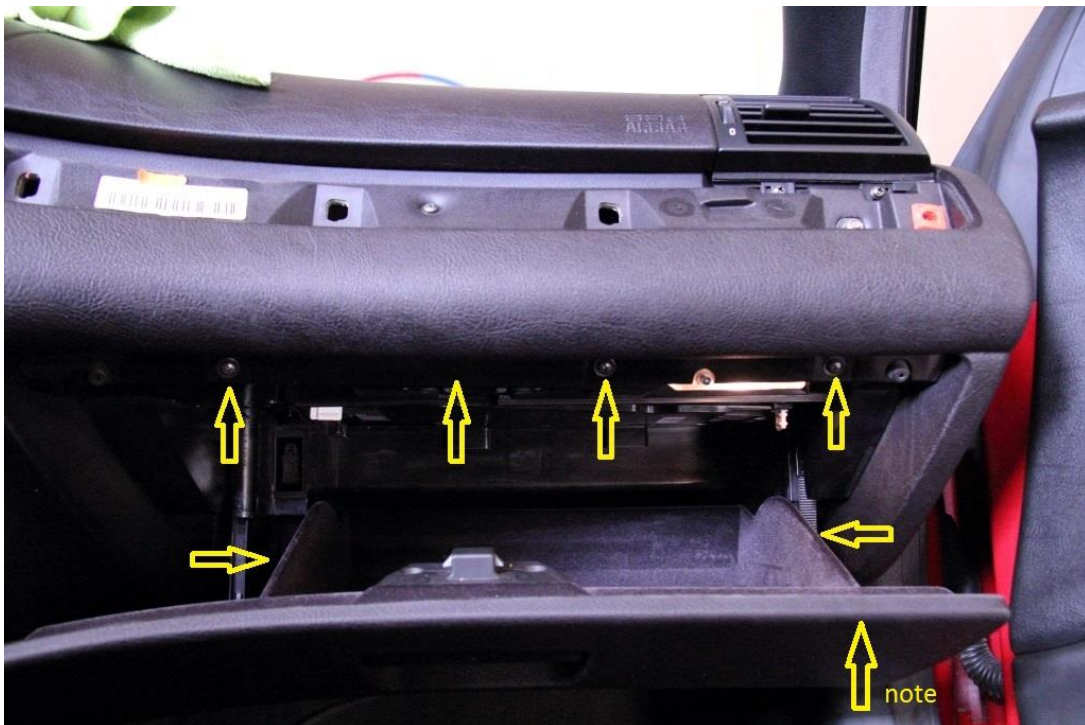
5. Remove the two screws then the center vent assembly by freeing the four pressure clips on the vents themselves. Do this by using the plastic trim tool, or an old credit card to slide between the dash and the vent. When all four are loose, the vent will pull straight out of the dash. I did not remove the vent control wire as I saw no need, and put the vent on the dash with a shop towel to prevent scratching.



6. Locate your (1) wiring harness including backup camera RCA plug and green backup wire, (2) moving the canbus module, input port and USB and (3) GPS module pulled out of the way.



7. Remove the (note) screw first with the glove box closed, as it is on a little tab right above the trim. Open and empty the glove box, then remove the six additional screws.



8. Slide passenger side door sill cover off. Some got it off by pulling straight up, but these plugs are EXTREMELY strong, so just slide the cover off. Remove the trim plugs with a pair of pliers by rocking forward to free one side, then back to free the other. Slide plugs back into the trim for reinstallation later.

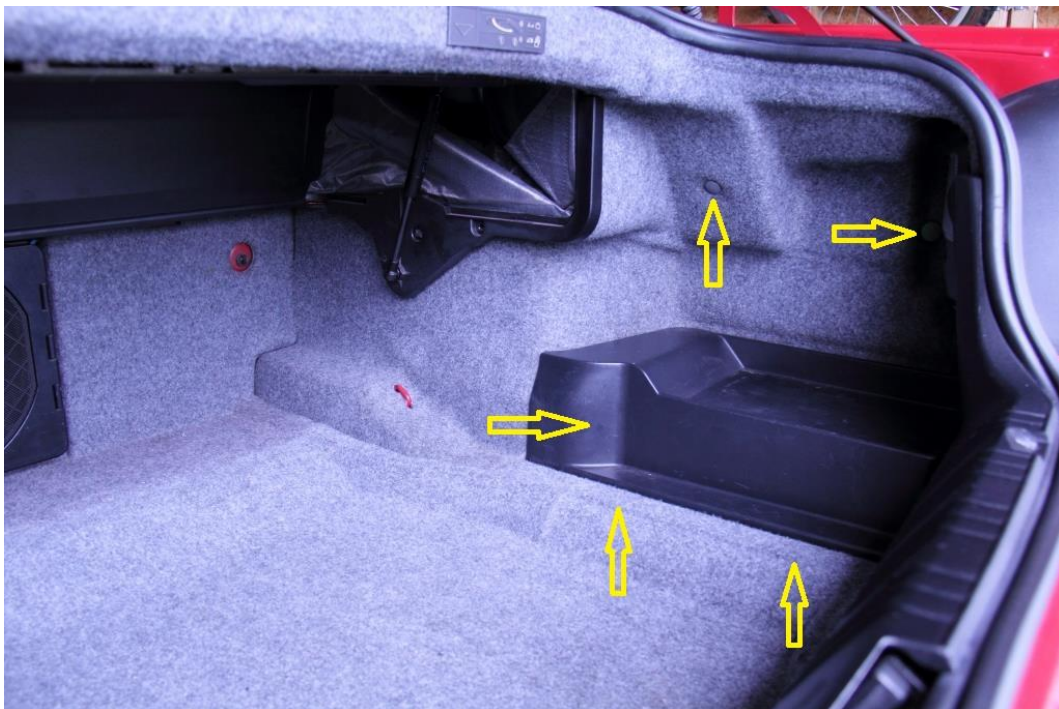
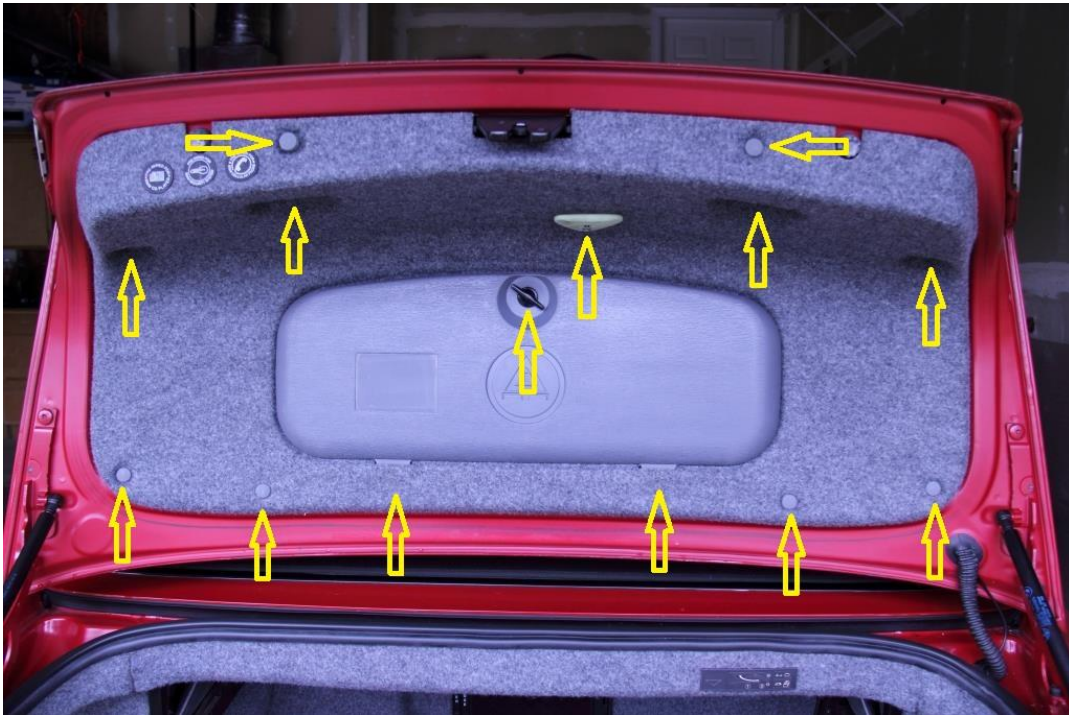


9. Remove the back seat base by pulling up on the front edge and set aside. Remove the cover for the ski bag pass through. Remove two nuts (one indicated by arrow) and pull the seat back out and up to remove as well.

Set seat base and back in a safe place. (Maybe use this opportunity to condition and clean your rear seat, and vacuum out the desiccated cheerios and wrappers that have somehow found themselves under the seat!)



10. Remove the trunk lining by removing all indicated pressure pins, the two securing screws for the tool tray, and unhooking the safety handle. Use a flat screwdriver or the trim tool to carefully pry up the pressure pins without breaking them. Remove trunk floor tray, and then the battery cover tray and two pressure pins. Remove side carpeting pressure pin and unhook gas door pull. Remove side carpeting carefully by pulling down and out, and set both liners aside.



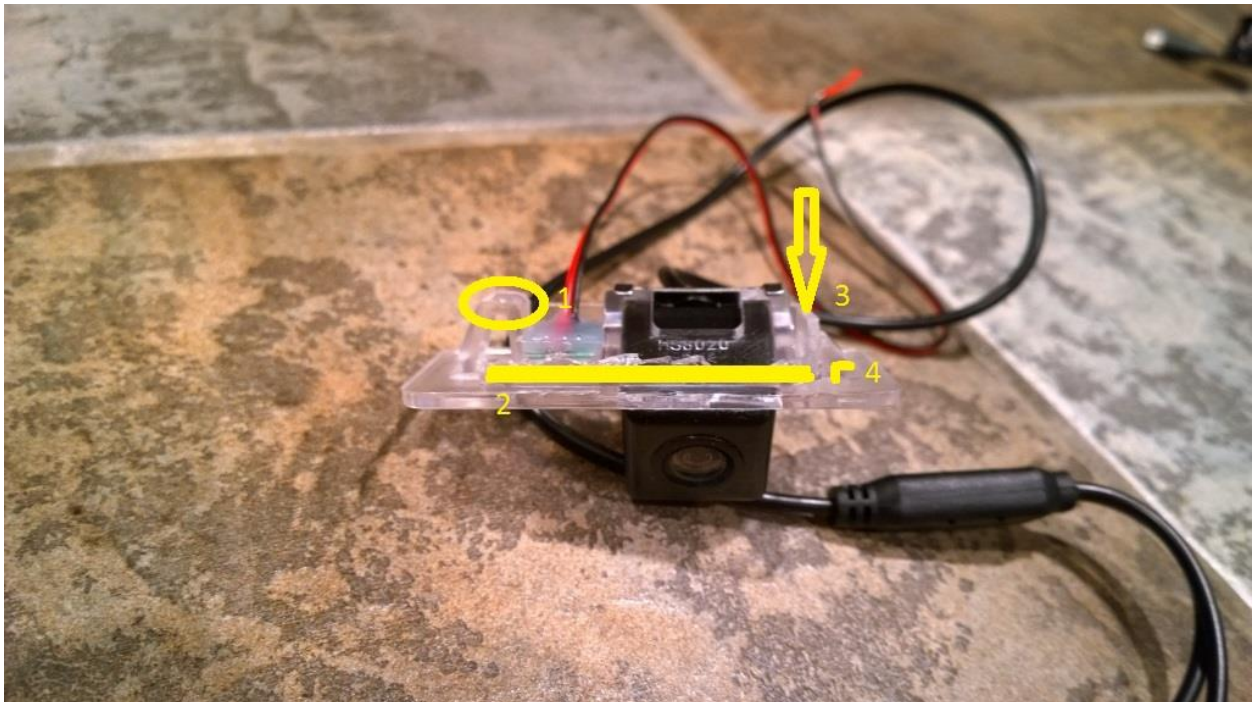
11. Using t-20 torx remove the 4 screws on the underside of the trim. The rear badge is held on with a circle of adhesive so gently pry free with a screwdriver (bad), trim tool (better) or thin bladed scraper. (best, for me). Remove torx screw under the badge. Unclip the power line to the trim and pull the trim off and out.



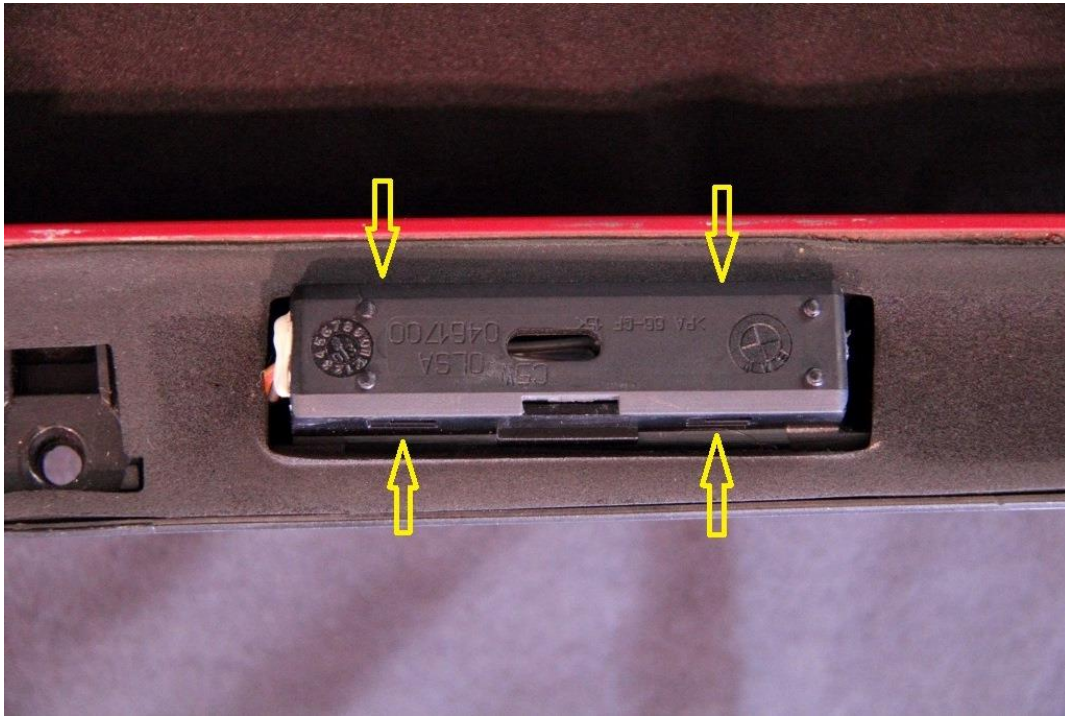
12. Here is the fun part... making a rectangular camera housing into a wedge shape. If you have a dremel tool with the right blades, this effort will be substantially easier than my experience. GO SLOW, wear gloves and be patient. The plastic housing is oddly soft in some areas and rock hard in others which makes cutting it challenging. I did this with a foolish combination of a strong utility knife, hack saw blade, and an Exacto blade for fine cuts. A dremel would make this significantly easier.

BE CAREFUL.

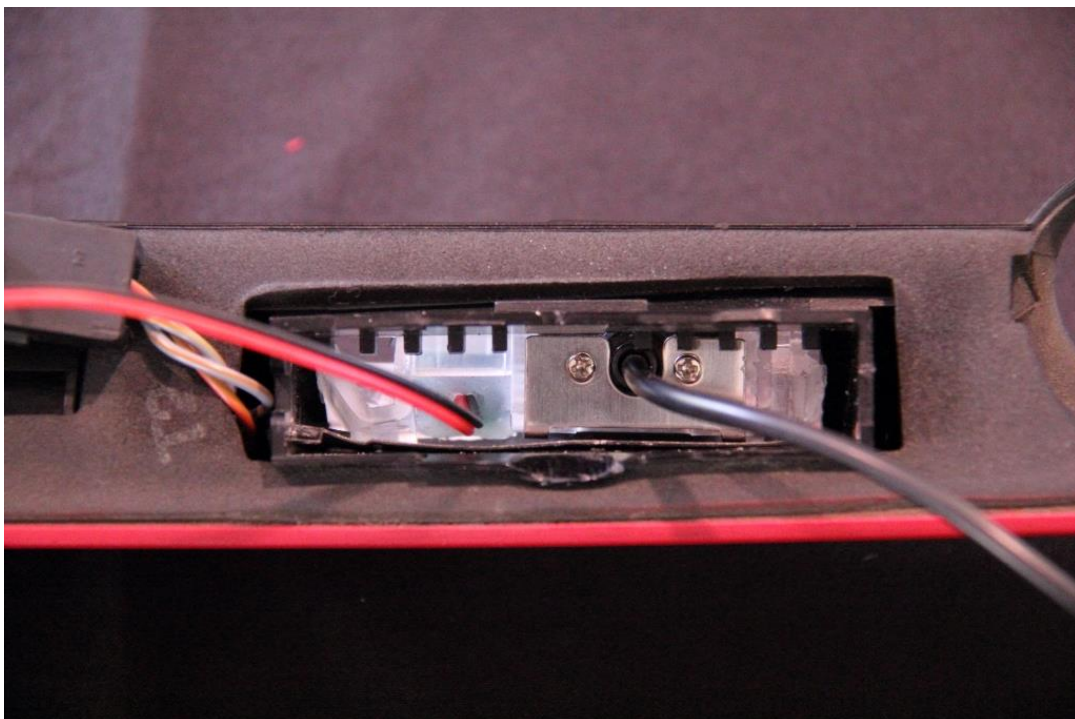
1. Cut the front edge of this hinge area back at about a 45 degree angle to about the middle of the hinge area. This will need to be shaved back as it rubs against the top of the trim housing. Do not cut through the hinge; just shave back until it fits in the trim socket.
2. Remove this entire ridge, cutting down at the angle of the housing until it cuts free.
3. Remove this ridge down to the L shape of the securing notch.
4. Carefully expand the depth and height of this notch. The plastic of the trim sidewall is thicker than the existing gap, so the space will need to be roughly doubled in height and depth.



13. Remove the plastic lens cover from the license plate light, right or left your choice. I removed the right side, when facing the rear of the car. Remove the bulb, and remove the socket from the trim. Use a thin bladed screwdriver to release the notches holding the socket in place.



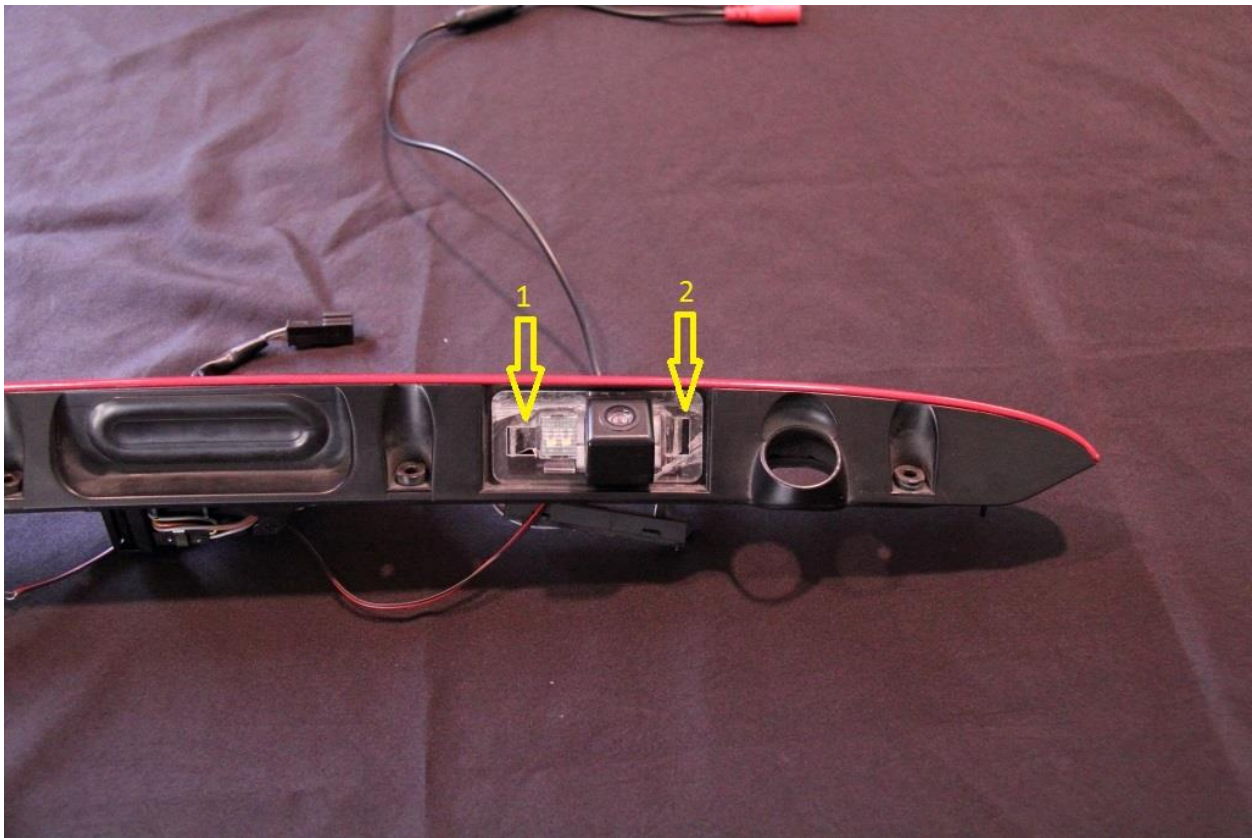
14. Check your modifications to the camera housing now in the socket space and make any adjustments and cuts as needed. Shape the housing until it fits well.



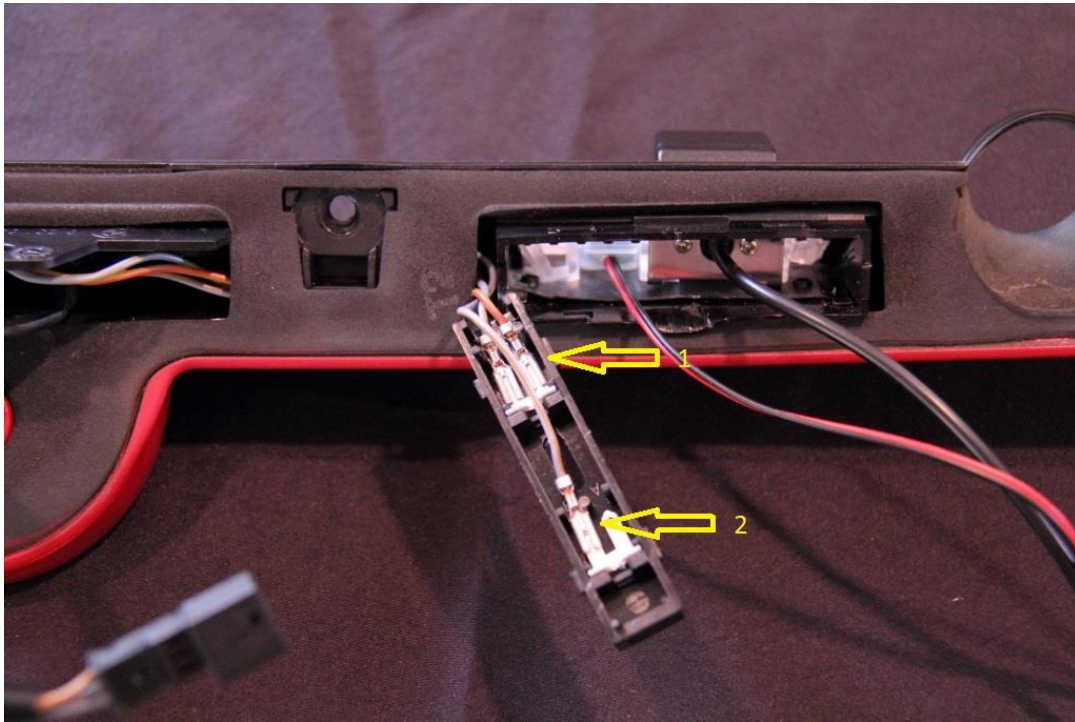
15. Make sure the camera is secure in the socket.

1. This is the tab lock side of the camera housing that should pressure fit and keep the camera in place. I found that with the top trimmed enough (stage 12.1) I would actually push the locking tab up and into the socket for an extremely secure fit. Grab the black camera housing and shake to ensure the camera won't come out due to vibration while driving.
2. Double check that the notch cut in stage 12.4 is wide enough to fit securely.

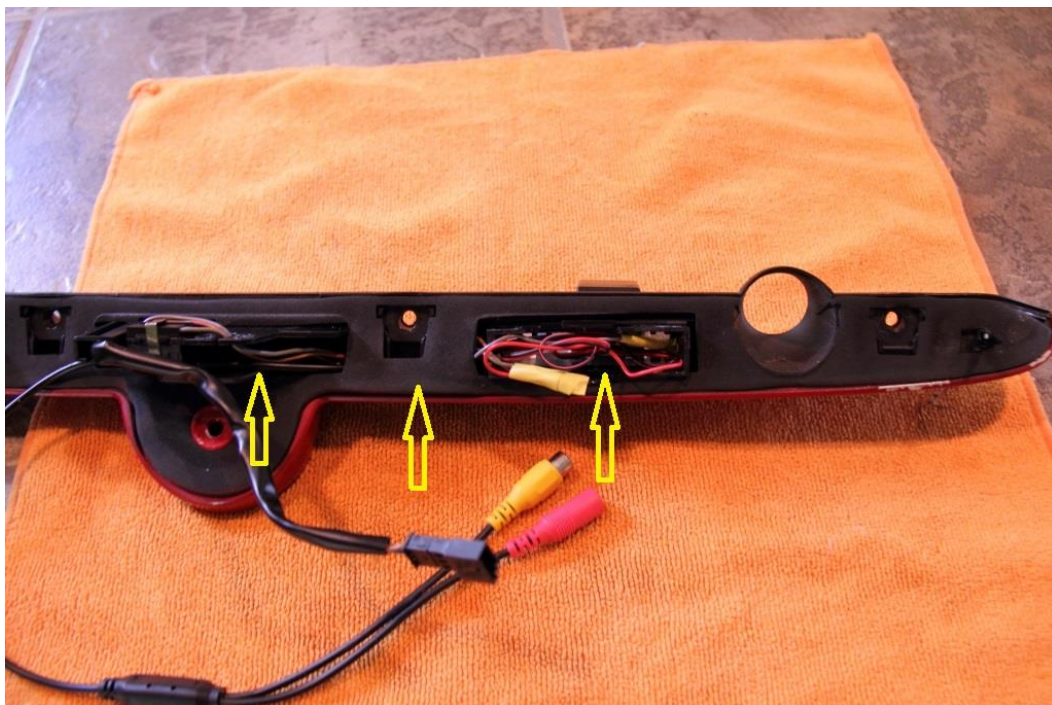
Before moving on, make sure the camera is secure and in place. Trim as appropriate to fit snugly into the trim socket.



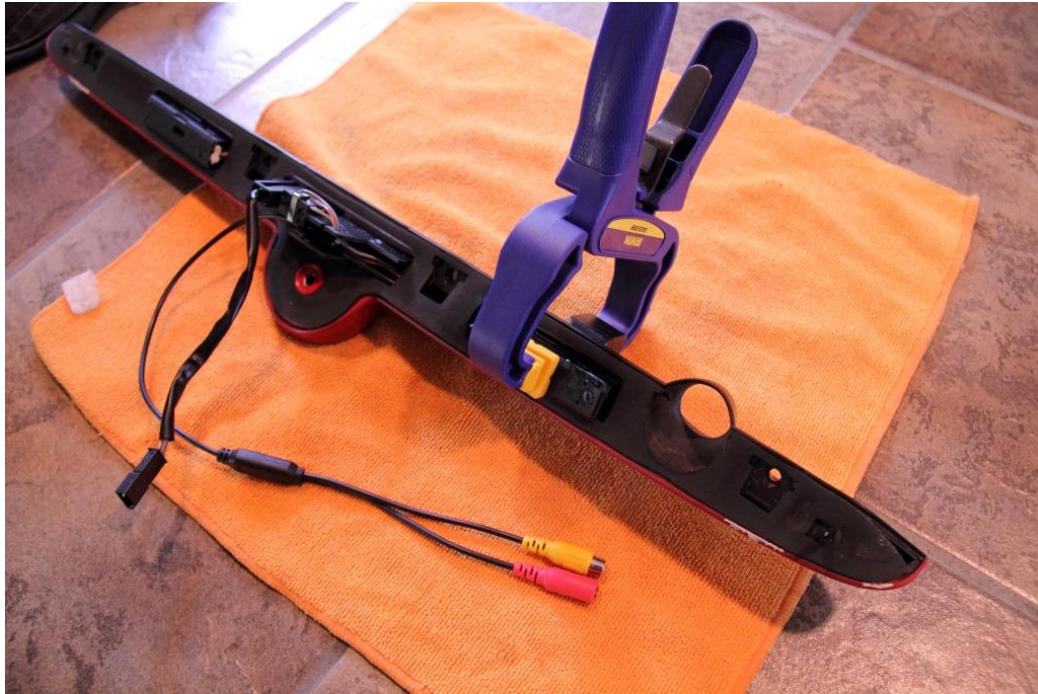
16. Remove the wire connectors from the socket and set it aside. Connect wire pair (1) and black LED license plate light ground together. Connect the red wire from the LED back up to wire (2). My taps sucked, I cut off the plug ends and connected all directly together and taped.



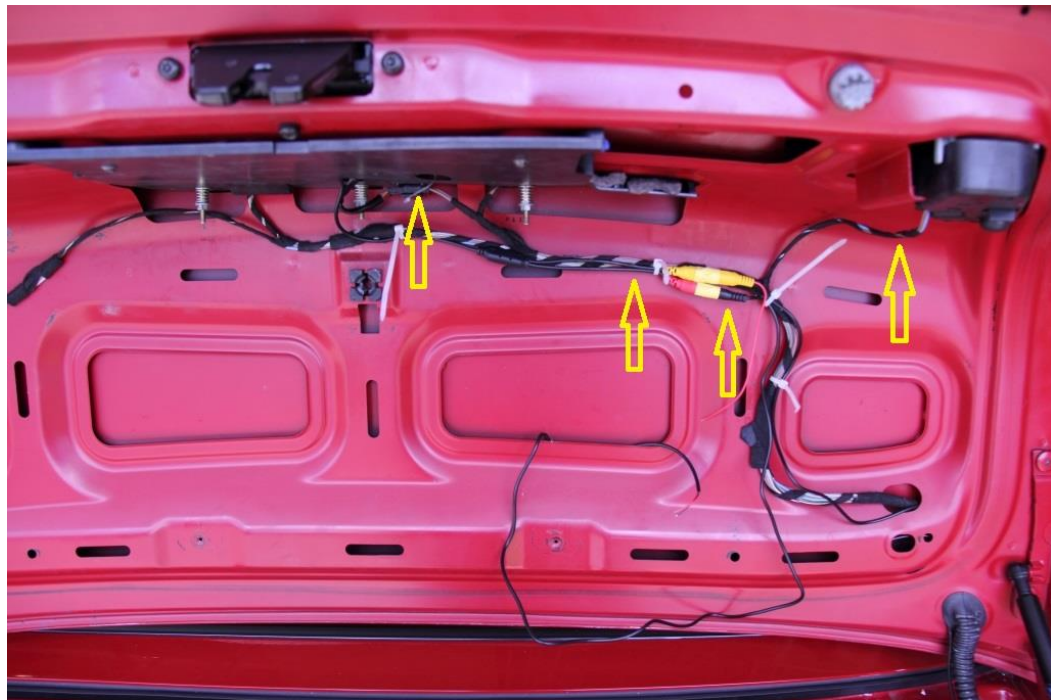
17. Route RCA cable under the rubber cover and next to the power cable. Coil LED wires back into the socket space. My wire taps were crap, so I directly connected the wires and used tape.



18. Attach the socket top cover with super glue to the socket, providing protection to the camera and wires. I used a clamp to ensure a good seal.



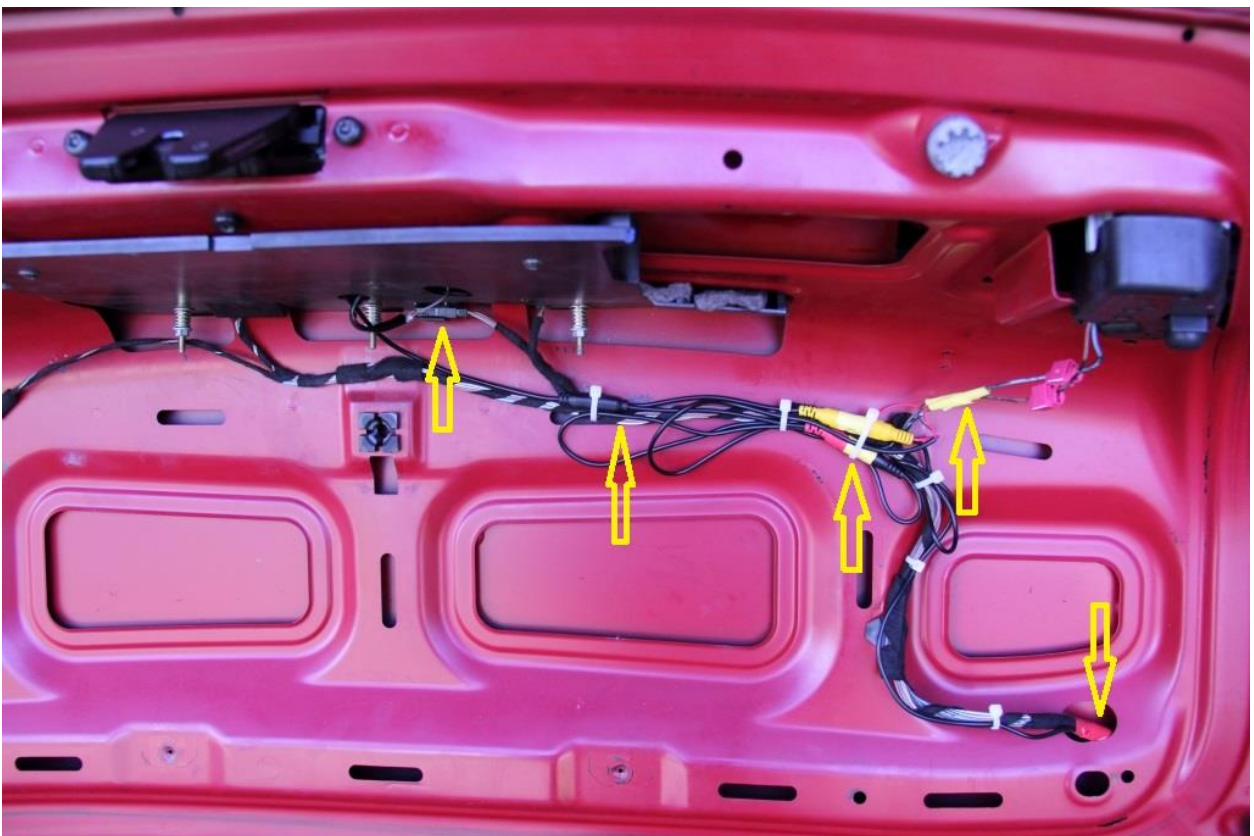
19. Feed power and RCA/power cable through the trunk hole, and secure trim back to the trunk with screws. Plug trim power back in and secure RCA/power with zip ties to wiring harness. Power and ground from the backup light will be used to power and activate the camera.



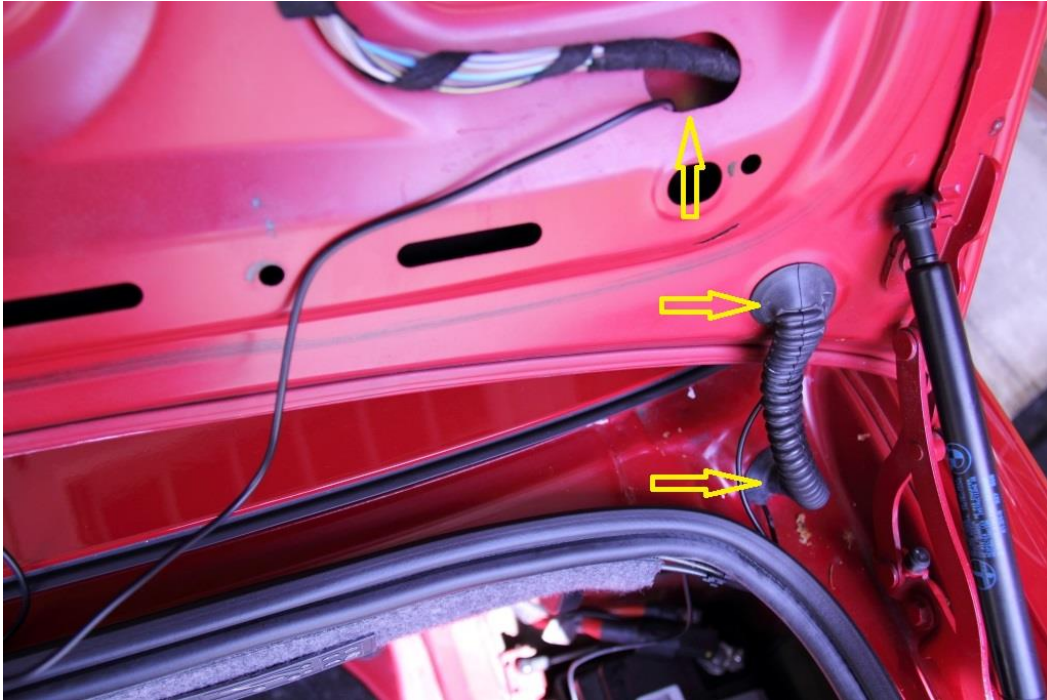
20. The blue/brown line to the backup light is positive and the brown (is always in BMWs) the ground.

1. Connect both the red positive from camera power, and the red wire from the RCA (camera activation trigger) to the blue/brown line.
2. Connect the black ground from the camera power line to the brown wire of the backup light.
3. Run a strip of electrical tape around both RCA and power connection to secure them in case of vibration or movement.
4. Secure the rest of the wiring using zip ties and route the RCA cable through the trunk lid and down to the rubber wire housing. Note I wrapped the cables with electrical tape to protect from friction or rubbing against the trunk lid.

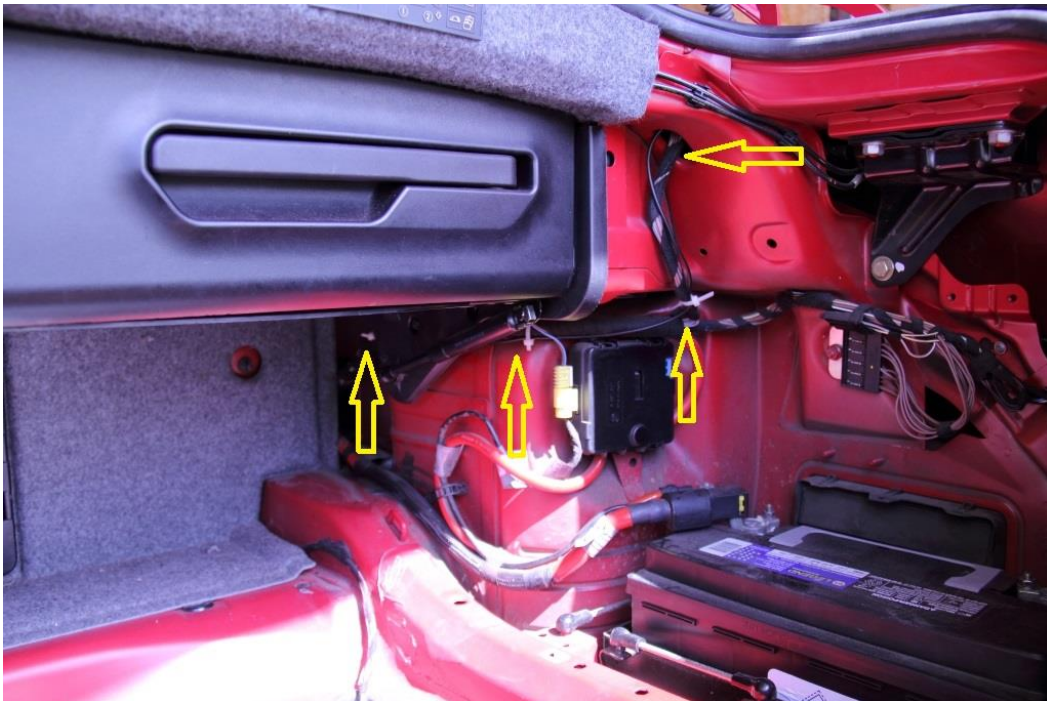
Ignore the wire taps in the picture, they were crap. I direct connected the power and ground wires.



21. Gently pull the ends of the rubber wire housing free and route the RCA cable through the trunk lid and down through the frame. Make SURE there is enough slack for the trunk to open and close properly. Reinsert hose ends and zip tie cable to the rubber wire housing.



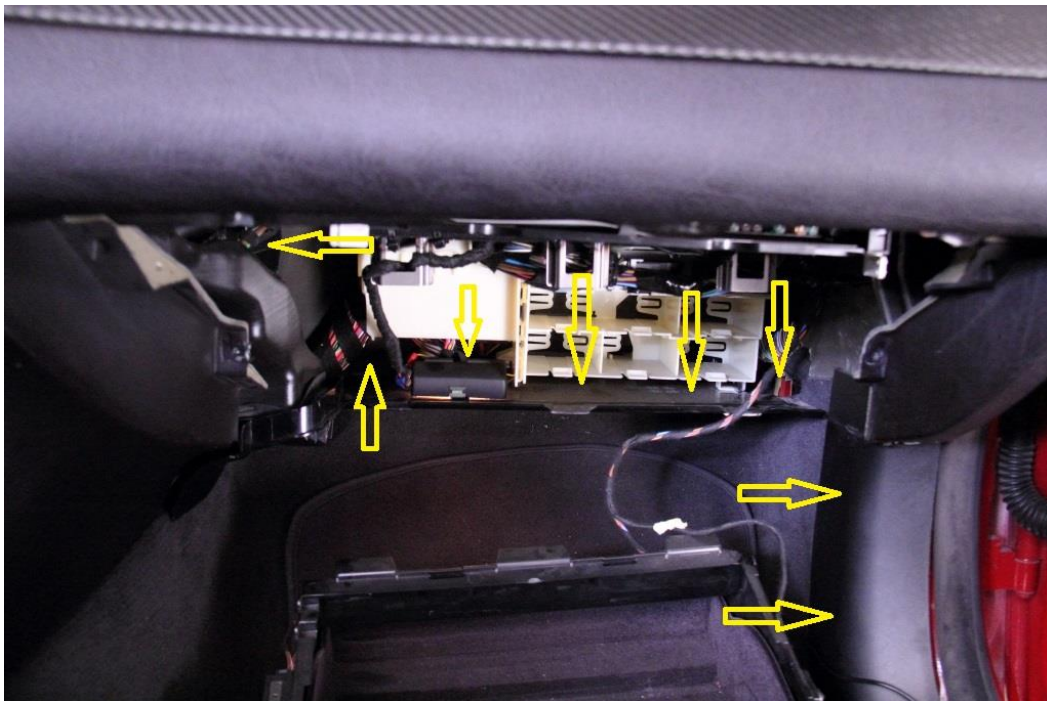
22. Route RCA cable along the existing wiring harness, behind the convertible top pocket and the through the cable hole into the back seat. Secure with zip ties.



23. Route RCA cable along the existing cable bundle under the rear side panel, and then down the door sill under the carpet.



24. Traveling right to left, route RCA cable behind trim plastic, across the tray, behind the foot well light and cable bundle and then up and into the center dash and the top of the Avant-2.



25. Plug the RCA cable into the backup camera RCA jack and secure with a strip of electrical tape. Connect the red RCA activation wire to the green harness bundle wire marked backup.

26. Ensure all of your cables are routed and in place, all connections are correct and trim are in place. Now is the REALLY fun part... if you haven't done so already, turn the ignition to the accessory position and power on the deck!

Key areas to test: I had to check all of my wiring about x8 to get it right. Check your work.

1. Flip on your headlights and check the LED license plate light.
2. With parking break set, turn key to start position and put the car in reverse. Check the deck and if the camera activates. Check the backup lamp to ensure it still works as well.
3. Check the trunk release button works and unlocks the trunk.

If something doesn't work, check all connections again.

1. If the LED lamp doesn't work, pull the rear trim off and make sure ground loop and power leads are connected properly. Both ground wires and the LED black ground should be connected. The LED power red wire and single positive line should be connected.
2. If the camera doesn't work, check activation and power wire and the ground connections to the backup lamp. Double check activation wire connection to the Avant-2 green backup wire and RCA cable connections at both ends.
3. If the trunk release doesn't work, double check the plug connection.



27. Reinstall the central vents by gently push it back into place until the clips click and the unit is secure. Reinstall both screws as indicated below to secure vents and deck.

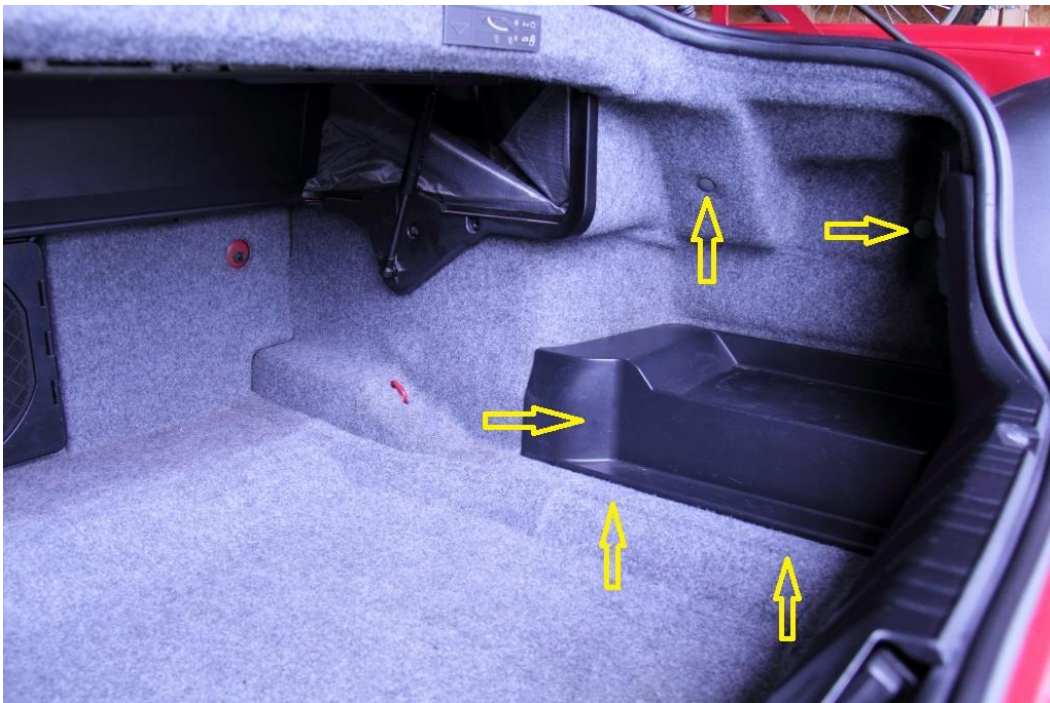


28. Then install the dash trim pieces in order of removal, center dash first then followed by the passenger side piece. Note: If you replaced your trim clips, double check they are in the horizontal locked position before trim is reinstalled. Also expect the new clips to be very snug as you press the trim into place.
29. Reinstall the glove box by lifting back into place and securing with the original seven screws. Snap the doorsill trim back into place with firm pressure and continue onto the back seat.
30. Put the rear seat back piece first and secure with both original two nuts. Snap the seat base back into place and push down until it locks down, and then the ski bag pass through.

31. Reinstall trunk lid liner along with toolkit tray and safety handle. Take this opportunity to double check your connections and zip ties for cable security. Don't set yourself up for a new rattle or frame noise.



32. Reinstall side carpet by sliding the long piece in first behind the top compartment lid and then the rest above the battery. Replace battery cover tray with pressure pins and trunk base tray.



33. Double check all functionality again: backup camera, license plate lights and backup light. If everything works and everything is replaced, you are done!

Clean up and put your tools away.



Congratulations! All in all this isn't a horribly hard project but just a LOT of work tearing the whole car apart from end to end.

That said taking the work slowly and patiently, it isn't that hard and you saved yourself a healthy amount of money from having a third party or vendor do the install. You also have done something they said couldn't be done...

Congratulations again and enjoy the new back up camera in your car!

Written by Stefan Yotz 5/2014

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There is no warrantee or guarantee to this guide and is provided in all good faith and best effort.

Huge thanks to:

[Tommy – AVINUSA.com](http://AVINUSA.com)

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