

Step 1 Get your [car](#) in the air. I used a jack and four jack stands. I recommend getting it as high in the air as you can.



Step 2 Remove the rear wheels.

Step 3 Remove the exhaust. There are 4 - 13mm bolts in the rear, 10-13mm bolts on the middle cross members, 2-13mm bolts with rubber spacers that mount to the transmission, and 4-18mm bolts attaching the exhaust to the headers.



Step 4 Remove Driveshaft heat shield. 4-10mm bolts, 2 front/2 rear - will need extensions.



Step 5 Remove driveshaft.

a. Disconnect the driveshaft from guibo. There are 3-18mm nuts/bolts (44 ft. lbs.) that will require two wrenches to remove.

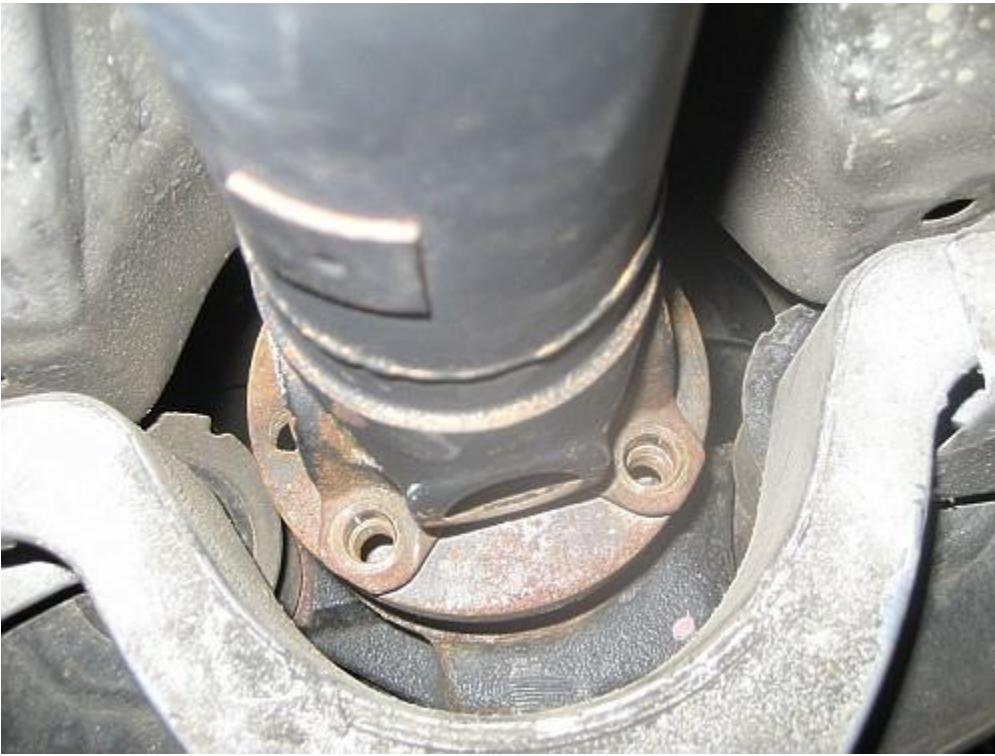


b. Disconnect driveshaft center carrier mount. 2-13mm (15 ft. lbs) nuts that attach to chassis.



c. Disconnect driveshaft from differential. You will need an E12 torx to remove these bolts. Get whichever ones you can get to. Then, release the e-brake from inside the car, rotate the driveshaft, and re-engage e-brake to get the other bolts.

There are 4 total. (61 ft. lbs.)



d. Remove small aluminum shield. There are 2-10mm bolts holding it on.



e. Remove the aluminum guard at the end of the driveshaft. It has 4-13mm bolts (22 ft. lbs.) and 2-18mm bolts. (57 ft. lbs.)

f. Separating the driveshaft from the differential will be difficult. There is a lip (as pictured) securing the driveshaft to the differential.



g. A few taps of a rubber mallet and some elbow grease should do the trick. The driveshaft should now be removed.



Step 6 If you plan to replace the differential bushing, you will want to disconnect the axles from the differential now. It requires the same E12 torx bit the driveshaft to differential bolts required. There are six on each side. I used roughly a 1 ½ ft worth of extension and stood outside the fender on each side. On the driver side, you will only be able to see and get to the bit on the bolt in the 2-3 o clock position. On the passenger side, you will only be able to see and get to the bit in the 9-10 o clock position. Mine took a lot of effort to break them loose. You will have to remove a bolt, then loosen the e-brake and rotate the axles, and then re-engage the e-brake to get to them all. It is easier if you have a friend to get in the car to handle the e-brake for you. (61 ft. lbs.)



This is why you don't take your car to a shop to have a new differential installed, or trust any shop your unfamiliar with for that matter:



Step 7 Unbolt shock from the hub on both sides. There is 1-18mm bolt (74 ft. lbs.) on each side. Support the hub with a jack before you loosen to prevent the hub being sprung down and damaging the brake lines. Repeat on opposite side.



Step 8 Now is a good time to disconnect the brake lines. Where the hard line meets the soft, there is an 11mm nut. Have something to catch the fluid, and unscrew this nut. Not much fluid should come out. You can now move the jack placed in step 7. Repeat on opposite side.





Step 9 Unbolt rear trailing arm from body. There are 3-18mm bolts (57 ft. lbs.) on each side. Make notes on their position.



Step 10 Coming from each brake assembly, there will be one or two wires leading to a black box mounted on each inner fender. Open these boxes and disconnect the wires.



Step 11 From inside the car, remove the parking brake boot. You will see 2-10mm nuts under the lever. Remove these nuts and washers.



Step 12 From underneath the car, pull on the two parking brake cables you see going into the body. Once pulled through, grip them by the control arm and pull them through the other body piece.





Step 13 Support the sub frame and everything else left. I used a motorcycle lift, it worked great but make do with whatever you have handy. Remove the 4-18mm bolts (57 ft. lbs.) holding the sub frame to the body. The front mounts may need a little crowbar encouragement to slip loose. Slowly lower the jack and roll the sub frame out from under the car.





Step 14 If you plan on replacing the sub frame and differential bushings while you have the sub frame out, now is the time to remove the differential. There are 2-18mm bolts (81 ft. lbs.) in the front, and 1-21mm bolt (128 ft. lbs.) in the rear. Unbolt these and remove the differential from the sub frame.





Step 15 Disconnect the rear control arms from the sub frame. There is 1-18mm (57 ft. lbs.) bolt on each arm.



Step 16 Disconnect rear trailing arms from sub frame. There is 1-18mm (81 ft. lbs.) bolt on each arm.

Step 17 Disconnect the sway bar from the sub frame. There are 2-13mm bolts holding it on.

Step 18 Your sub frame is free! Rejoice! I went and cleaned mine off with degreaser and a hose at this point.



Doing a lil sub frame dance:

Step 19 There are a few different ways to get the bushings out of the sub frame. I choose to burn them out. Sorry environmentalists, I don't believe in global warming.

Step 20 All of the bushings came out with ease with the exception of the rear differential bushing, which happens to have a thick metal casing around it. I took a reciprocating saw to it, careful not to saw all the way through. Then I proceeded to knock the crap out of it with a chisel and a mallet which did the trick.



Step 21 Burning the bushings out did a little damage to the paint, nothing a little spray paint can't fix.

Step 22 Press in the new bushings. I used the home made tool found in this thread:

<http://forum.e46fanatics.com/showthr...al+bushing+diy>, It worked great. You might also consider taking it to a shop to have the new bushings pressed in.

Step 23 Reattach sub frame to control arms, trailing arms, and sway bar.

Step 24 Now is a good time to strip the trunk interior. Very simple, pull the floor carpet, tray, [spare tire](#), and the side walls. Go ahead and disconnect the battery and remove it from the vehicle.

Step 25 Remove the rear seat. It just pulls right out.



Lift up the sound deadening material and you will see a round plate with 4-10mm nuts holding it down. Unbolt them and lift the plate. Unplug the connector. Repeat on other side.



Step 26 From underneath the car, release the hose clamps on the [fuel](#) lines and separate the hard lines from the soft.



Loosen the hose clamp on the filler spout and remove hose. The Bentley manual says that there is a vent hose you must also undo, but I found none. There are 3-13mm (14 ft. lbs.) nuts that hold the gas tank up, 2 on the straps, and 1 in the middle. Place a jack and a piece of wood underneath the gas tank before loosening these. As you begin to lower the gas tank, have another person help hold the gas tank steady as it will try to fall off if not centered well.



Step 27 From under the car, you will find the bolt that holds the front of the sub frame in place. Remove it. I used a crescent wrench to loosen it because I didn't have a wrench big enough. I'm guessing it is a 29-30mm.



Step 28 Now you need to scrap the underbody coating off the areas you are going to weld to. As I did this I found out that the crack I thought was only an inch turned out to be about four inches. Yippee!



If there is already a crack in the sub frame, you want to gouge it out with a grinder and re fill this area with a welder before you begin welding in the reinforcement plates.

The rest is basically straight from the TMS instructions, slightly modified.

Step 29 Place the reinforcement plates in the proper location. Use a marker to outline the 4 steel plates, then remove all the paint and under coating inside the outlined area. I used a cordless drill with an underbody coating remover, it worked great.



A grinder with a wire brush would also work fine. Just make sure you clean everything off, any paint or undercoating left on the welding surface will cause defects in the weld and weaken it.

Step 30 Use the two 12 x 1.5 bolts supplied with the kit to hold any two plates in place using the stock mounting holes. I lost the bolts and used the stock front sub frame bolts. You do not need to tighten the bolts much; they are just there to hold the plate up while welding and properly align the hole in the plate. You might find that the 150 for 20 dollars worth of steel reinforcement kit you purchased does not [fit](#) properly.



No big deal really. Just wallow out the hole to make it fit.

Step 31 In each reinforcement plate you will find holes that do not line up with anything. These are for plug welds, or basically a solid rivet. Use a 1/2" drill bit to cut through the outer sheet metal of the chassis. Careful not to drill to deep, as you are just trying to get to the inner sheet metal to tie it all together. The plate can now be welded. Using the factory front sub frame bolt is a good place to ground your welder. Fill in the holes with the plug welds first, then coming back and welding around the outer edge of the plate. On the front plates, you do not need to weld entirely around the plate, a stitch weld is sufficient.

Step 32 After welding all the plates, grind the plug welds down and any high points so they are flush with the plate.



Step 33 Clean any residue and burnt paint off.

Step 34 Spray any bare metal with a few coats of etching primer. Once it dries spray with seam sealer. Be careful with this stuff and wear gloves, I finished my car last week and still have it on my hands. Finally, after the seam sealer dries, spray a few coats of undercoating.





Step 35 Apparently, your sub frame will first crack in a place that is not visible from the exterior of the car (this was not the case with my car). Place the two 3x3.5" sheet metal plates in the trunk as seen below. Draw a line around them and make another line about ¼" inside the line you just traced. Use a cut off wheel to cut the sheet metal out inside the

inside line. This will make it easier it easier to weld the plates in later on.



Step 36 Inside each cut you are going to see three plug welds. Cut out a section of the sheet metal between the three welds "kind of in a triangle shape" according to TMS, but more of a square shape IMO. This is done because the three spot welds are not sufficient surface area to hold the load place on it, and this will increase the surface area and also fix any cracks that may have started (this is where they begin). Clean the inner sheet metal as best you can before cutting, this section is sprayed with a very flammable factory rust protector. Using a worn cut off wheel gives you more room to move.



Step 37 Weld the upper sheet metal to the lower sheet metal around the area you just cut out. If you have any existing cracks in the sheet metal, weld them up now. Clean any welding residue and burnt paint off. There is not a point in primer and painting these welds at this point, as the heat from welding the top plate on will burn it off (my personal opinion), but you can if you like. I welded the plate on the top, and then stuck the tube that comes with the seam sealer into the whole next to the plate and filled it with the expanding foam.

Step 38 Place the 3x3.5" steel plate over the hole. Butt the plate against the lip in the sheet metal towards the front of the car. Tack weld the plate in the back (front of car) and about half way down just before the factory sheet metal begins to curve down. I used a hammer to make the plate match the contour of the factory sheet metal. You do not need to weld entirely around this plate, a stitch weld is sufficient. Primer and paint the bare metal, followed by the seam sealer like before. I used semi gloss black paint as my final coating.



Step 39 Installation of the rear end is the reverse of removal with one exception: When installing the aluminum brace over the driveshaft/differential, you need to use the two spacers supplied with the kit. If you don't, you risk cracking the brace. Place a small dab of RTV silicone on the spacers in case the cross member is ever removed in the future.

Step 40 Install trunk interior and anything else you have not yet reassembled.

Step 41 Bleed brakes.

Step 42 Get alignment. Test drive car. [Smile](#)👉.

A thanks goes out to Bodyman and Paul (kritical aspect) for the advice and helping hands.

:takes a bow: