

REVSHIFT

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E46 Rear Subframe Reinforcement

The E46 rear driveline and suspension are very similar to that of the E36. An unfortunate side effect of this is that the E46 also shares some of the same problems as the E36. One of these problems is the rear mounting points for the subframe, which can rip out from their spots in the sheet metal (see figure 1). This happens because the rear differential transmits the torsional load from the engine through the subframe, then into the chassis. This constant loading and unloading weakens the sheet metal and causes it to fatigue and separate from the chassis. BMW tried to fix this problem in the E46 by placing a cross member on the front two mounting points of the subframe. This cross member keeps the front mounting points from having problems by placing the bushing and the stud in double-shear, thus reducing the twisting action on the sheet metal. The unfortunate side effect of this is that the load from the front of the subframe now gets transmitted to the left rear of the subframe. This is where we have seen many failures of the chassis on low mileage street cars and race cars.

This product reinforces the chassis sheet metal at the subframe mounting points. We do this by thickening the metal and distributing the load over a larger area. This kit will save time when repairing the chassis, and is also strongly recommended as a preventative maintenance item.

Notes: The rear suspension, rear subframe, and exhaust must be removed to perform this job.

Warning: Requires Welding. Only a professional welder should perform this work. The ECU, alternator, and battery should all be disconnected before welding to prevent electrical damage. The welding machine should be directly grounded to the chassis, not to any suspension parts. It is also strongly recommended that the trunk interior, and fuel tank are removed and all fuel lines are capped to reduce the fire hazard while welding.

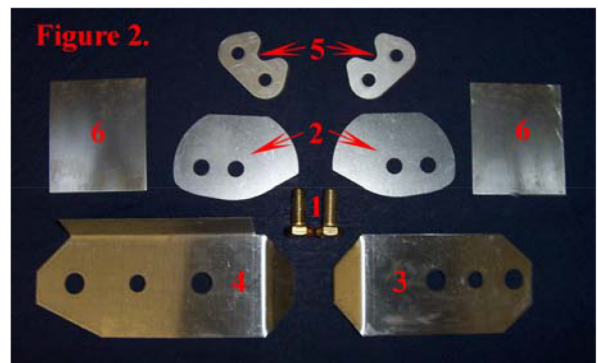
Parts list for kit: (See Figure 2)

1. Two 12mm x 1.5 bolts
2. Two front subframe mounting point Reinforcements
3. One Right rear subframe mounting point Reinforcement
4. One Left rear subframe mounting point Reinforcement
5. Two cross member spacers
6. Two trunk block off plates

Applications: 1999 - 2005 (E46 3- series and M3)

When would it be a good time to perform this work on my car?

You can save time if you are doing any rear suspension work, exhaust, or doing a differential fluid change.



Directions:

1. Properly lift and support the car to access the rear suspension
2. Remove the rear suspension and fuel system as outlined in a repair manual
3. Place the reinforcements in the proper location. Use a maker to outline the 4 steel reinforcement plates, then remove all the paint and undercoating inside the outline and 1” outside of the outline. (A die grinder with wire wheel or sanding disk works well)

NOTE: Any paint or undercoating on the welding surface will cause defects in the weld and weaken it.



4. Use the two 12x1.5 bolts supplied with the kit to hold any two plates in place in the stock mounting hole. You do not need to tighten the bolt much, as it is just there to line up the hole in the plate and chassis and hold the reinforcement in place when welding.



5. In each of the reinforcement plates there are 1/2" holes that do not line up with anything. These holes are for making a rosette weld. The front plates have one hole and the rear two plates have two holes. Use a 1/2" drill bit to cut through the outer sheet metal of the chassis. Do not drill too deep, as you are just trying to get to the inner sheet metal to tie it all together. The plate can now be welded. **Tip:** Use a factory stud or bolt screwed in the chassis for a good ground point in one of the other mounting points you are not welding around. Fill in the holes with a rosette weld first, then weld around the outer edge of the reinforcement. On the front reinforcements you do not need to weld the entire way around the plate, a stitch weld is sufficient.



6. After welding all the plates grind the rosettes and any high points so they are flush with the plate.



7. Clean any welding residue and burnt paint off. We suggest using seam sealer where you have stitch welded. Primer and paint all bare metal. We suggest doing this here so it can dry while you work on the next step.



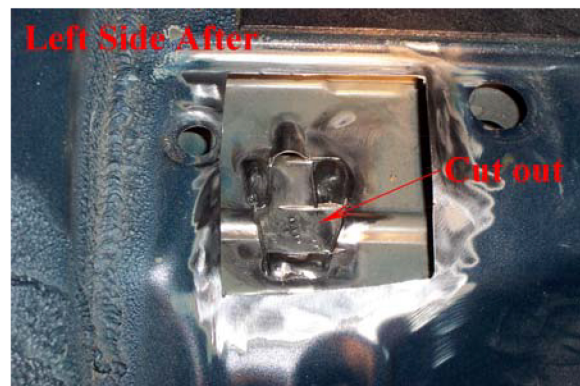
8. Remove the trunk interior to gain access to the top of the rear subframe mounting point. This is where the first crack in the sheet metal starts, in a place that is not clearly visible. Place the two 3"x3.5" sheet metal plates in the trunk as seen below. Draw a line around them, and make another line about 1/4" inside the line you just traced. Use a cut off wheel to cut the sheet metal out inside the inner lines. This will make the hole smaller than the sheet metal rectangle supplied with the kit. This will be helpful later.



9. Inside each cut out you are going to see three rosette welds. Cut out a section of the sheet metal between the three welds "kind of in a triangle shape" (see after pic below). This is done because the three spot welds are not sufficient surface area to hold the load placed on it, and this will increase the surface area and also fix any cracks that may have started (this is where they begin).

Tips:

- A. Clean the inner sheet metal before cutting. This will help when it is time to weld. This section is sprayed with a factory rust protector that is very flammable.
- B. Use a cut off wheel, it helps if you have a used cut off blade that is worn down and is a bit smaller.



10. 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 from fatigue, weld them up at this point. Clean any welding residue and burnt paint off. Primer and paint all bare metal inside the box section.



11. Place the 3" x 3.5" steel plates over the hole. Butt the plate up against the lip in the sheet metal toward the front of the car. Tack weld it in place by the lip. Place two more tack welds about half way down the plate just before factory sheet metal starts to curve down. Bend the rest of the plate to contour the factory sheet metal and spot weld in place. You do not need to weld the entire way around the plate, a stitch weld is sufficient. Clean any welding residue and burnt paint off. We suggest using seam sealer any place you may have stitch welded. Primer and paint all bare metal. We suggest doing this now so it can dry while you work on reinstalling the rear suspension.



12. Install the rear Suspension as outlined in the repair manual with one exception: When installing the aluminum cross member on 3 series or the steel cross member on M3 you will need to use the two spacers supplied with the kit. **Warning:** if you do not use the spacers you may crack the cross member. Place a small dab of RTV silicone between the cross member and the spacer. This will help keep the spacers from getting lost if the cross member is removed in the future.



13. Install trunk interior and any other components that you removed from car. Have an alignment done to assure proper adjustment. Test drive car.