

Flyin' Miata

Cannon subframe brace 13-69000

Please read the instructions all the way through before attempting installation.

These instructions assume you know how to use a socket and ratchet and a torque wrench. If you don't have these basic skills, get some help or have a mechanic install the brace for you.

- 13mm, 14mm, 17mm end wrenches and sockets, ratchet and short extension
- Torque wrench capable of measuring 13-70 lb-ft. of torque
- Ramps or another method of raising the car while keeping the weight on the tires
- Wire brush or something else to clean rusty threads
- Penetrating oil and anti-seize compound and some rags to clean up with
- Something to mark the current alignment setting, preferably white paint

1. If possible, the day before you install the brace, slide under the rear of the Miata and spray a little penetrating oil on the four nuts that will be removed for the installation. These four are the two 17mm nuts on the lower, inner ends of the lower suspension arms (see figure 1). Also spray a little on the lower nut of each of the two "U" shaped clamps that hold the bushings for the rear sway bar.

2. Put the rear of the Miata up on ramps, or a lift that keeps the rear suspension loaded. Jack stands will allow the rear wheels to hang there and will preload the brace when the car is back on the ground, changing the alignment, so don't use them. If you don't have ramps, you can straddle the car over a ditch or gutter, allowing you the space to work on the car. **NEVER WORK UNDER A CAR SUPPORTED ONLY BY JACKS.**

3. Once the car is in position, block at least one front wheel. You will be working close to the pipe and muffler so allow the exhaust to cool off. About ½ hour should be sufficient.

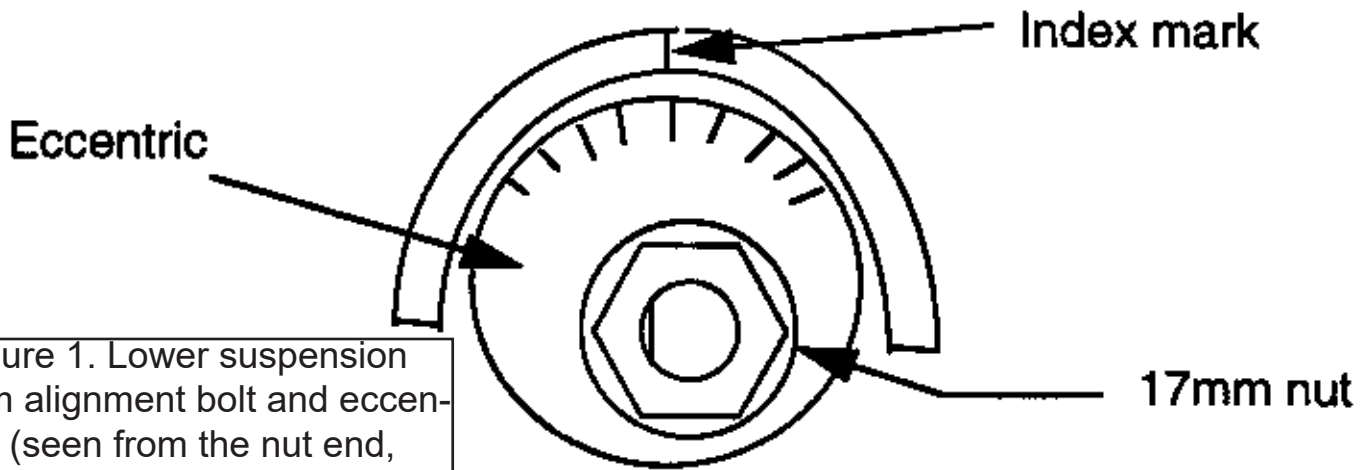


Figure 1. Lower suspension arm alignment bolt and eccentric (seen from the nut end, the bolt end is similar)

4. Slide under the car and find the other (forward) end of the alignment bolt you sprayed earlier with penetrating oil. Use a rag to clean the area on the eccentric around the bolt head and the little raised semicircle around the eccentric and bolt. Then paint a slim line across the single mark at 12 o'clock and the matching point on the eccentric. This will be your reference point to make sure the alignment can be re-stored if you disturb it. Do this on the front (head end) and back (nut end) of both lower alignment bolts (total of four places). See Figure 1.
5. If the thread protruding from the bolt appear rusty, use the wire brush to clean them before removal.
6. Using the 17mm socket and ratchet on the nut end, and a 17mm end wrench on the bolt end, loosen and remove the nuts on the two alignment bolts. It will take some force as these are torqued to 70 ft. lbs. (or more if Bubba did your last alignment with an air wrench). Use the end wrench to prevent the bolt from turning. After the nuts are removed, check the marks on both ends of each bolt to make sure the alignment hasn't moved. If it has moved, use the end wrench on the bolt head to reset the marks. The bolt has a flat side on the threaded area and both eccentrics are keyed to the bolt.
7. Using a 14mm socket and ratchet, remove the bottom nuts from the "U" shaped clamps that hold the sway bar bushings. Do not remove the "U" shaped clamp.
8. Clean the threads on all four bolts again with the wire brush.
9. Place the four stainless steel nuts, bolts & washers and the removable section of the brace under the car where you can reach them. The long side of the removable section goes towards the rear of the car when the brace is installed.

10. Position the brace over the four mounting bolts. It should slide easily over the bolts. Each of the holes is oversize or slotted to allow for different alignment settings. If you cannot get the brace to fit over all four bolts, do not force it, you may damage the threads on the bolts.

The possibility exists that the manufacturing tolerances of the rear subframe for your particular car are beyond the capability of the brace. It is also possible that your rear suspension has been damaged in an accident and the subframe is slightly bent. If the brace does not fit and you have not damaged the brace, pack it up and send it back. The price of the brace will be refunded minus the shipping charges. **THE ONLY GUARANTEE ON THIS SUBFRAME BRACE IS THAT IT WILL FIT YOUR CAR.**

Fit Check Time: If you have the Jackson Racing rear sway bar, you may have to modify the 'U' shaped clamp. It is thicker than the Mazda clamp. With the brace pushed snugly against the two upper mounting studs, check to see how close the brace is to seating against the alignment eccentric on the lower bolts. If there is more than ¼" clearance, you must remove the 'U' clamps and either grind or file some of the metal away from the part of the clamp that the brace fits against. Take off small amounts of metal and keep checking until the gap is less than ¼". Paint the 'U' clamp to prevent corrosion of the bare metal.

11. Remove the brace from the mounting bolts. With the exhaust pipe enclosed in the large opening in the brace, install the removable section with the long side towards the rear of the car. Put a flat washer on each stainless steel bolt and install the bolts from the side away from you so that the threads are pointed to the rear of the car. Install another flat washer, a lock washer and the nut, leaving the nut finger tight. Install all four bolts.

12. Leaving the brace hanging on the exhaust pipe for a moment, put a small dab of anti-seize compound on each of the four mounting bolts on the car.

13. Position the brace back on the four mounting bolts and push it forward until it stops against the eccentric. Install the four nuts (two 14mm and two 17mm) and turn them finger tight.

14. Using the torque wrench with a 13mm socket (holding the bolt end with a 13mm end wrench), torque the four bolt on the removable section to 25 ft lb.

15. Using a ratchet and 14mm and 17mm sockets, snug up the four mounting nuts. Rotate between each nut so that you pull the brace down evenly. The factory torque spec for the 14mm nuts is 13-20 lb-ft., but in some situations torquing to 20 lb-ft. has been reported to be enough to brake the studs. If your studs are at all rusty or if you are not sure about the calibration of your torque wrench, we recommend playing it safe and aim for a lower value that is still within the factory specification.

16. Using the 17mm end wrench to hold the bolt, torque the 17mm nuts to 35 ft. lb. Check the alignment marks you painted on the bolt end of the adjuster. You will no longer be able to see the marks on the nut end. If the marks are not perfectly aligned, loosen the 17mm nut and use the 17mm end wrench on the bolt head to bring the marks into alignment. Then re-torque to 35 ft. lb. and check again. If both sides are aligned, increase the torque to 70 ft. lb. and again check the alignment marks. If they are not aligned, loosen the nuts and repeat Step 16 again until the torque is at 70 ft. lb. and the marks are aligned.

17. Check the clearance around the exhaust pipe. If the pipe is against the brace, or if it hits the brace when you smack the exhaust pipe with your hand, check the rubber links on the exhaust system mounts and replace any that are bad. If the pipe still hits the brace, use a suitable tool and bend the exhaust mounting tabs a little to move the exhaust pipe away from the brace.

18. Double check to make sure you have torqued all eight nuts to the correct torque. Remove the car from the ramps and test drive. Find a safe place to test drive the car. It will feel different and react differently to extreme cornering loads.

If you have your rear suspension aligned while the brace is on the car, make sure the technician loosens all four mounting bolts before the alignment adjustments are made. Then make sure he/she torques the bolts correctly, 13-20 lb-ft. for the 14mm nuts (**see step 15 for important details**) and 70 lb-ft. for the 17mm nuts. The fact that the index marks on the rear are covered will make no difference to the tech. They go by the alignment machine, not those marks.

The underside of a car is a harsh environment, especially during winter. Over time, rock chips are inevitable and if they expose the bare aluminum, it may corrode. It would take many years for the corrosion to compromise the strength of the brace, so an occasional Spring check and touchup of any chips would be wise to prevent long term corrosion.

If you have any questions about the installation, email Flyin' Miata at support@flyinmiata.com