

Flyin' Miata

FM FOX ND suspension kit 13-16175

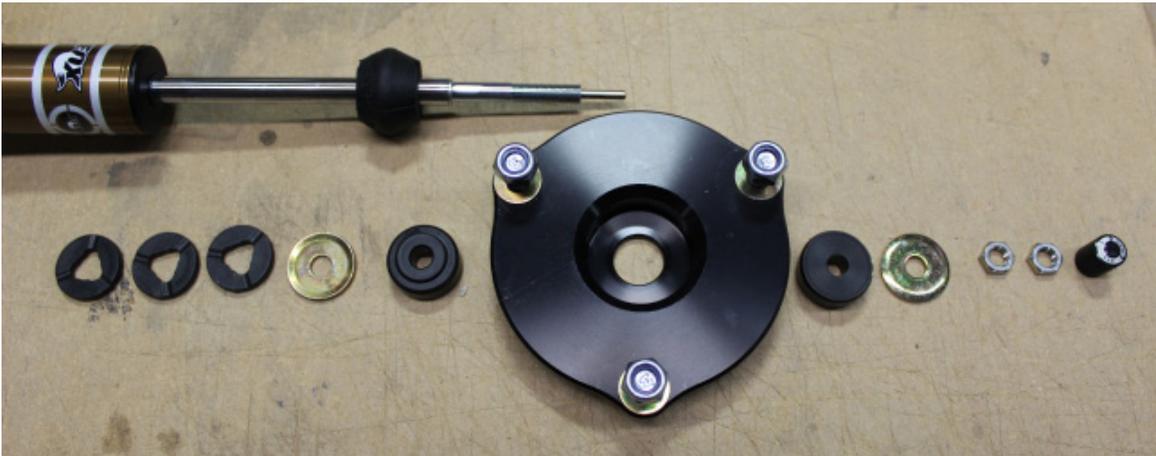
Congratulations on your purchase of the best in suspension for the ND Miata! The installation should be pretty straightforward, so you can follow the factory procedure with a couple of exceptions. Following are some general hints and some specific requirements for the FOX setup.

Front

- Lift the front of the car (if not the whole thing), and remove the front wheels.
- Detach the end link from the sway bar or control arm, then remove the inner bolts holding the upper control arm in place. The upright will flop around, so don't put any undue stress on the brake line.
- Unbolt the shock mount (three nuts from the top) and the shock (one bolt on the bottom), and take the shock / spring assembly out as one piece. You'll reuse the hardware that holds this assembly to the car, but that's it - you won't reuse anything else from this assembly.
- Remove the upper shock mount from the shock - pay attention to the order and orientation of the parts, although that's specified on the next page. Assemble the spring parts onto the shock as shown below. The order on the shock body should be (left being closer to the bottom of the shock / ground): locking spring perch (pre-installed on the shock, not shown), spring bearing (single vertical lip pointing up), main spring, spacer (vertical lip on both sides), helper spring, spring bearing (vertical lip pointing down). Be sure you're using the appropriate main spring (last three digits of 400 for sport, 600 for track) and helper spring (shorter spring in front, as compared to the rear).
- Once you have the springs on, it's time for the shock mount. The order on the shock shaft should be: bumpstop (shown



on shaft), spacers (see information next page), large washer (concave face points up towards bushing, same as the gold one at the top), stepped bushing (shoulder points up towards shock mount), shock mount, stepped bushing (shoulder points down towards shock mount), large washer (concave face points down towards bushing), two nuts, adjuster. Torque the first nut to 10 lb-ft, then tighten the second nut against the first nut while holding the first nut stationary. Be sure the set screw on the adjuster is lined up with the flat on the shaft, then tighten the set screw in the adjuster.



- The spacers are there to adjust maximum travel to suit your wheel/tire setup. Three spacers is the standard setup, suitable for tires of stock diameter. Tall tires such as a 245/40-17 should have four. You can confirm the correct number for your setup by installing the shocks without springs along with a wheel, then fully compressing the suspension with a jack and checking to make sure it cannot rub.
- Run the spring perch down so that the whole assembly can be compressed to be shorter, then weave it into place. Run the perch up to 8.375" from the base of the spring perch to the center of the mounting bolt (as shown). This will need to be tweaked later, but should be a good starting point. Using the new lower nuts and bolts, slip the assembly into place, then reinstall the control arm and sway bar end link. You can tighten the end link, but do NOT fully tighten the control arm bolts. Those must be tightened with the weight of the car on its wheels. Repeat for the other side, and the front is done.
- If your car has a shock tower brace, it will need to be drilled out to create clearance for the damping adjustment knob. Put some grease on the top edge of the knob, carefully drop the brace straight down until it contacts the knob (with the mounting studs lined up), then drill at least a 1/2"



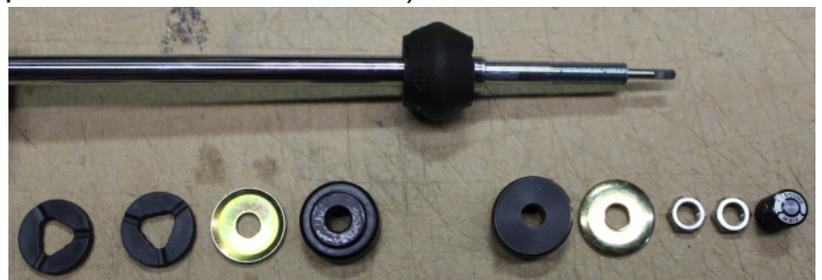
hole where the grease is on the brace. Bigger is typically better here, in case the hole isn't centered. Repeat for the other side. The adjustment knob can be manipulated from the backside, by rolling your finger over it.

Rear

- Lift the rear of the car (if it's not up already), then remove the rear wheels.
- Remove the trunk lining that blocks access to the shock tops. There are a number of black plastic fasteners - pull the center out roughly 1/4", then pull the entire fastener out.
- Detach the end links.
- Unbolt the shock mount (two nuts inside the trunk) and the one bolt holding the bottom of the shock. Weave the shock/spring assembly out of the car.
- Use a spring compressor to remove tension from the stock shock mount (which will be reused), then remove the nut(s) on the top of the shock shaft. Carefully release the spring compressor.
- The rear springs get slipped onto the rear shocks in the same order as the front (left-to-right in the picture): locking spring perch (pre-installed on the shock, not shown), spring bearing, main spring, spacer, helper spring, spring locator. Ensure the pieces are oriented as they were on the front. Be sure you're using the correct springs - the helper should be the longer one, the main spring should be 225 for the sport setup and 350 for the track.



- The shock mount assembly is the same as well. Again, from left to right: bump stop (shown on shaft), spacers, large washer (concave face points up towards bushing), stepped bushing (shoulder points up towards shock mounts), stock shock mount (not shown), stepped bushing (shoulder points down towards shock mount), large washer (concave face points down towards bushing), two nuts, adjuster.



Torque the first nut to 10 lb-ft, then tighten the second nut against the first nut while holding the first nut stationary. Be sure the set screw on the adjuster is lined up with the flat on the shaft, then tighten the set screw in the adjuster.

- The standard number of spacers for the rear is two. If you are running a 245, use 6 spacers.
- Slip the assembly into place. Run the perch up to 6.75" from the base of the spring perch to the center of the mounting bolt (as shown for the front). Be sure to use the new lower nuts and bolts.
- Loosen ALL rubber bushings in the suspension, put the car on its wheels, roll it back and forth a few times, then tighten all of the bushings (with the car still on its wheels). Failure to do this could result in an improper ride height and premature bushing failures.
- To set the damping, tighten the adjusters all the way down (don't force them), then count the number of clicks as you unscrew them. For the sport setup, we recommend 17 clicks from full stiff on the front and 22 on the rear. These are recommended starting points, feel free to adjust from there as needed. Track kits should be set stiffer (fewer clicks). Stiffening the front typically improves the turn-in, softening the rear typically improves the overall ride quality. Obviously there are limitations - all the way stiff on the front and all the way soft on the rear will NOT give you good turn-in and a good ride.
- Set the ride height as desired. We suggest starting with 13" front and 13.5" rear, as measured from the center of the wheel to the fender lip - i.e., the first bit of painted body that you hit. Due to the design of the shocks, they do allow for more freedom of ride height. There is a limit to how high you can go, as you'll eventually run into coil bind, but these can be run fairly high or fairly low. We don't have definite limits for either measurement, but you're welcome to experiment.
- We recommend the alignment specs below, but feel free to deviate as needed. If you call asking for the super-secret alignment specs that we keep to ourselves and don't give customers, they don't exist. We use these specs on 95% of the cars we drive and work on, typically only dedicated track cars will deviate. That having been said, if you're trying to cure specific issues or have a truly special situation, we're happy to discuss options with you.



Front

- Caster: 8.0 degrees (as much as possible)
- Camber: 1.8 degrees negative (again, as much as possible)
- Toe-in: 1/16" total (1/32" per side)

Rear

- Camber: 1.8 degrees negative (match the front)
- Toe-in: 1/16" total

Conversions

- 1/16" = .15° = 9 arcminutes

Headlight leveling procedure

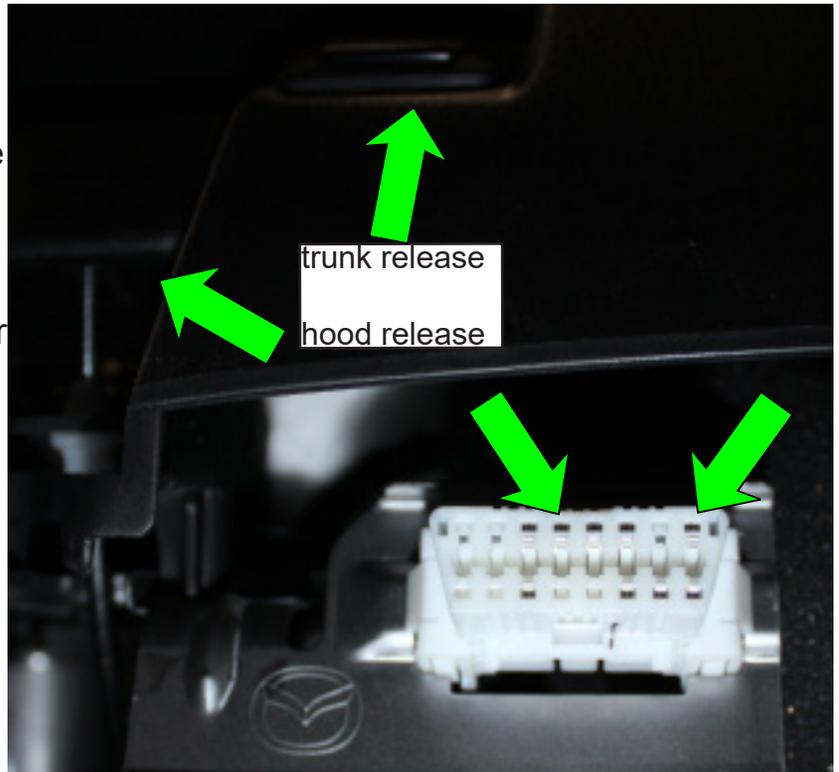
- 2016-2018 Miatas can use the procedure below or they can use our headlight Levelizer (13-89100). Our Levelizer is a mechanical item that bolts on and is adjustable, the procedure below is more of a programming thing. You must do one or the other or your headlights will point down dramatically. 2019+ Miatas (any Miata or Fiat 124 without a mechanical sensor on the left (driver's side) rear suspension) use a different method and don't need any adjustment. If you're unsure, look up our "Levelizer" online and check its instructions to see if you have that part.

1. Be sure the car is on its wheels, not raised on jack stands or a lift.

2. Get two scrap pieces of wire and strip both ends of both wires.

3. Find the OBD-II plug - it's in the driver's footwell, to the right of the hood release and just behind the lower edge of the dash plastic.

4. Insert one piece of wire into the terminal that's closest to the lower edge of the dash and all the way to the right (towards the center console). The other wire should be inserted into the fifth terminal from the right and in the same row (closest to the lower edge of the dash). Be sure these two wires aren't touching. **BE ABSOLUTELY SURE ABOUT YOUR WIRE CONNECTIONS, INCORRECT CONNECTIONS CAN CAUSE DAMAGE.**



5. Turn the ignition on. This requires two pushes of the start-stop button *without* the clutch (or brake in an auto) pedal depressed. The engine can be running, but there's no reason for it to be. ***This procedure must be performed within 30 seconds of turning the ignition on.***

6. Connect the two wires to each other three times, holding the connection for roughly .5 seconds then leaving the connection open for roughly .5 seconds each time. It's picky about timing, so if you don't find success try holding the connection longer or shorter until it works.

7. Check the gauge cluster. The LED headlight warning light should illuminate three times every .25 seconds then turn off. You should also be able to hear the headlight motors (if it's quiet enough). If the light doesn't turn off on its own, the procedure may have been performed incorrectly. Check your connections and repeat step five.

8. Once the light turns itself off, remove the wires. You're done!