



Supplemental assembly instructions for original FCM-NB-Variant1 and Newer FCM Elite 3120 shock and 3140 coilover suspensions

Starting out, bump stop and spacers/packers

1. Follow general shock assembly procedures per the factory service manual.
2. Be sure to add the bump stop to each shock shaft. We usually orient the cone toward the shock body. Any packers/spacers used are best placed between shock body and bump stop.

Proper tightening of the M12 nut / compression of shock mount bushings for NB mounts

3. By hand, thread an FCM-supplied M12 x 1.25 nut over the shock shaft threads. On previous version shafts with M8 hex the wall is fairly thin so be sure to not create side-load which may compromise the shaft integrity.
4. **Once there is resistance while tightening the bushings**, insert an M8 Allen Key (**it MUST be an M8 and MUST be used with the flat end of the Allen inserted into the shaft**)



Figure 1.

5. Press securely along the axis of the Allen key into the shock shaft and tightened the M12 nut until you experience strong resistance. It may help to use a clean, gloved (or dry) hand along the shock shaft to keep it from spinning as you tighten. We've found that near the limit where the shaft wants to turn, the bushings are very close to proper compression.



- By hand, thread the M12 x 1.25 jam nut (shorter of the two supplied nuts) onto the shaft and measure the distance from the top of the shaft threads to the top of the nut. It should be **6mm +/- 0.5mm**. **This may vary from car to car so please check before over-tightening and causing damage to the shaft (the upper threads may break with excess side load from the M8 Allen).** **When there is strong resistance, the bushings have been properly loaded.**



Figure 2.

- If necessary, take the jam nut off and adjust the primary nut position until the bushing compression spec is met.
- Add the M12 jam nut and secure hand-tight, again keep any pressure into the shaft from the M8 Allen key along the axis. Again, the gap should be about 6mm +/- 0.5mm, as shown above.

Proper tightening of the M12 nut for NA mounts (autocross Stock class for 90-97 Miatas):

- When using NA shock mounts, the center hole needs to be drilled out to nominal 12.0 mm. A 1/2 “ Unibit works acceptably well although the fit isn’t as ideal vs. using a true 12.0 metric bit. If you already have shock mounts drilled to 12mm from another application don’t worry, just re-use them.



10. When assembling the FCM Elite single adjustable, follow the image above for reference. First the 12mm ID spacer goes on the shock shaft, then a 12mm ID fender washer. Above that (in place of the finger) is the NA shock mount. Then another M12 ID spacer. The final nut(s) will be either an M12 nyloc or double-nut (standard M12 nut and secondary M12 jam nut).
11. Desired torque is 20-22 lb-ft.

Damping adjustments (All version)

12. The earlier FCM Variant 1 shocks use an M8 x 1.25 adjusting set screw to give a range of adjustment from full stiff (almost zero bleed/extremely high resistance) to 7 turns full from stiff. For street use, we recommend experimenting with 3-6 turns, depending on how much comfort vs. precision is desired. On smooth surfaces, damping can be increased.
13. Later FCM Elite single or double adjustable (31X0 and 32X0) use a finer pitch adjustment screw (M5 x 1.0) to give about 10 turns of adjustment range. Nominal settings are 1.5-2.0 turns front and ½ turn softer in the rear. These are good dry settings, you may find better grip with the suspension set to softer settings (by 1-2 turns) in wetter conditions.

14. If firmer damping is desired, use a 5/32" (supplied) or M5 Allen key and turn the internal set screw clockwise, just as you would to tighten a screw or bolt. For softer damping, adjust counter clockwise. When in doubt, always index back to FULL STIFF then count number of turns softer from stiff. There are approximately 7 useful turns of adjustment. Up to about 1.5 turn, the adjustment is quite linear. From 0-1.5 turn, the adjuster goes into a more exponential range. In the full stiff to 1 turn from stiff range, the amount of low-speed bleed force becomes so great most tires would simply skitter across the surface. Experiment and see what works well for your needs.
15. These are the ranges we use for various types of driving:

Grand Touring/Maximum comfort : 4-7 turns from full stiff
Street and Backroads: 3-5 turns
Track / Enthusiastic driving : 2-4 turns
Autocross / Drift : 1-3 turns

Usually, the same setting front and rear is a good baseline. If a value is printed on the shock body that indicates our recommended starting setup. Firmer damping can be used for smooth surfaces or sharper response. For wet events, go about 1-3 turns softer than your dry setting if you feel the car is not giving optimal traction.

16. In most cases the shock produces more rebound damping than compression. So, if the car is understeering/tight at corner entry, add rear damping compared to the front. On corner exit, if the car is pushing/understeering, add front damping vs. rear. If loose at corner entry, soften rear. Loose at corner exit, soften front.

Enjoy your FCM-improved suspension!