Thank you for being one of the people who joined in on this so we could make it happen! It's been a fun project, and it wouldn't have happened without your support.

Don't like reading? Search "**DF Goblin Spherical Strut Mount Install Instructions**" on YouTube for a video.

My preferred contact would be the DF forum or FB messenger, but you can also email me: b.holt1293@gmail.com

Disclaimer:

A lot of care has gone into the design, including FEA, fatigue analysis, and validation of the hardware, bearings, and fits with a FOS > 3 under a 3G bump scenario. That said, as with any performance aftermarket suspension component, I want to be clear about intended use and responsibility:

- These parts are intended for off-road, racing, or competition use only
- Installation and use inherently involve risk
- Proper installation (including correct torque and hardware) is critical
- The end user assumes responsibility for installation, use, and ongoing inspection

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Installation: (reference post #53 in the group buy thread for pictures)

1. Lift your Goblin and place a jack under the lower control arm to support it from drooping.
2. Remove the old mounting plate and the original stack of hardware.
3. Inspect the damper shaft for any cracks … try to flex the threaded portion with your hands to reveal any stress cracks that may already be present.
4. Correct your ride height
    a. Stack together your previous parts and measure the distance between the top of your mounting plate and the bottom of the spring seat. Compare it to the new spherical mount plate ([your setup] – [new plate] (~0.584")).
    b. Raise your lower spring perch by this difference
5. Optional: grind out the ID tabs on QA1 springs.
6. If you purchased Torrington bearings, install them now under your spring
7. Install the spherical strut mount with 3x 3/8 bolts, nuts, and washers, and torque to 36 ft*lbs
    a. The outermost hole will use a square nut and no washer on the bottom. Clock the nut so that one of the 4 flats is fore-aft. In addition, the flat face of the square nut is the load bearing face (the flat face points up towards the plate, beveled face points down).
8. Note: Some misalignment spacers will retain themselves in the bearing bore, but some may slip out. If they fall out, the smaller OD end goes inside the bearing bore.
9. Raise the damper, carefully aligning the damper through the ID of the misalignment spacers.
    a. You may pivot the spherical bearing with a bar, so it aligns with your damper shaft.
10. Install the nut without a washer, and torque to 20 ft*lbs
11. Install the adjuster knob
12. Install the dust cap
    a. If your Goblin is frequently subjected to water, or you wash it with a pressure washer, I would recommend adding a sealant or thick grease to the gasket. As is, it meets IP67 requirements, but this doesn't cover > 24 hours of water, or pressurized water.
    b. If you opt to leave off the dust cap, still install the 3x ¼-20 screws.

Service:

1. **Bearing replacement (FK COM10T-F1): Removal can be difficult, but DIY-able. I can service these for a fee as well.**
    a. Remove snap ring
    b. Heat in an oven @ 350F for ~20-30 minutes. This will soften the retaining compound, and relieve most of the interference fit. Never exceed 350F or you may damage the T6 temper on these parts.
    c. Apply penetrating oil (just a couple drops…. you don't want to cool the assembly).
    d. Quickly (don't let it cool) press out the bearing, there are a few ways to do this:
        i. Press ball w/ < 1000lb: If you're lucky, you'll be able to press the bearing off the ball using an arbor press. Never apply excessive (>1000lb) force to the ball, or you'll expand the outer race. It will act as a wedge anchor, potentially leaving you with an unextractable outer race and a damaged bore.
        ii. Press outer race w/ >1000lb: There is a sliver of outer race accessible from the back side, if you want to apply any appreciable force onto the bearing, you need to make/find tooling that pushes on the outer race, or you're going to ruin the strut mount for the aforementioned wedge anchor issue.
        iii. Welder: Instead of pressing on the top side, you can TIG weld something onto the outer race on the bottom side, and pull rather than push.
        iv. Add knockout holes: As an absolute last resort, the shoulder at the end of the bore is not structural. You can drill 3 holes for dowel pins, and press on the dowels to push on the outer race.
    e. Clean the bore w/ scotch brite, sand paper, and/or acetone depending on the bore condition.
    f. Measure new bearing + snap ring stack. These bearings aren't very consistent batch to batch in terms of width, I had to turn some of them narrower. The max allowable bearing + ring stack is 0.542" (0.536" nominal)… you need to reduce your outer race bearing width if it exceeds this.
    g. Heat strut mount in oven at 300F for 25-30 minutes
    h. Pull it out of the oven, and immediately perform step h-j (you have seconds)
    i. Add retaining compound into bore and bearing: Loctite 609 if the bore is healthy, Loctite 660 if the bore was damaged and needed to be sanded out/significant cleanup was needed.
    j. Install bearing: half the time it would drop in, half the time it needed a light touch on the arbor press; seat bearing to end with a press. I highly recommend using the 3D printed bearing guide I posted in the group buy.
    k. Add a drop of retaining compound around the perimeter of the outer race so it can wick down.
    l. Install snap ring (sharp side away from bearing) and verify that it's fully expanded… If it isn't, the bearing likely wasn't pressed in fully, or the bearing/snap ring stack is too wide.
2. **Spring centering ring (switch to a 2.25" coilover spring)**
    a. Apply heat (a small heat gun works best) to one edge of the plastic spring centering ring
    b. Pry out/stretch the heated area and remove the spring centering ring
    c. Note: If you want to go back to a 2.5" spring, you'll need to print and press on a new centering ring

Proactive FAQs/explanation of design:

1. **Why are these bearings so stiff?** They're F1 fit bearings and it's required for longevity in our current loading scenario. They feel stiff, but it's comparable to what you'll see in a new ball joint, and is the correct bearing for this application.
2. **Why do I need to replace one of my nuts with a square nut?** If the spring is clocked in a particular way, it would slightly interfere with a washer. Running a square nut provides a comparable bearing area to running a washer + hex nut, but provides clearance for the spring.
3. **Why are some areas of this part not anodized?** (1) Bearing bore: Hard anodize performs poorly for interference fits: the hoop stresses caused by pressing in the bearing can cause micro cracking that starts at the anodized layer, and it doesn't work well with retaining compound. (2) Fillet area around the spring perch: leaving this raw will improve fatigue performance. Hard anodize doesn't perform well in fatigue, bending, or tension.
4. **Why is there a plastic ring at the spring perch instead of a single piece of billet?** The plastic snap-fit centering ring allows for a large hidden fillet between the perch and body, which greatly improves fatigue strength by reducing stress concentration in a critical area. As a bonus, it also allows switching to a 2.25" spring with a spacer.
5. **Can I run without the dust cap?** You absolutely can, just make sure you still install the 3x ¼-20 screws. Keep in mind that you will dramatically reduce the bearing life due to contamination.
6. **How long will these bearings last?** I couldn't tell you that unfortunately. I can tell you that the bearings I selected are wildly overkill for this application, and I have experience with a similar bearing in a similar application that is subject to over 3X the forces that we'll see, and it's just starting to show signs of wear after 7 years of monthly track abuse.