



## Tesla Model 3 Front Upper Control Arm Install Guide



**Warning:** Parts of this installation are highly dangerous when performed improperly or with improper tools. This install is intended to be performed by a **certified professional technician**. Installation of this suspension on a vehicle is done at your own risk, and all liabilities associated with the performance and safety of the vehicle will be assumed by the owner of the vehicle.

**We do not recommend installing these control arms in conjunction with any suspension kit other than Redwood motorsports Ohlins DFV Coilovers. Differences in stroke and free length with other suspension kits can lead to the arm contacting the chassis.**

**\*Important note about shock assembly, setup, and adjustment:**

All of our suspension kits must be assembled to the recommended free length. The dual-adjustable nature of the Redwood Motorsports Ohlins DFV's allow adjustment of vehicle height via both Free Length and Preload. This allows nearly infinite customization for advanced and or custom setups, however, it is possible to adjust the shocks to the point where battery to ground clearance becomes compromised. As with any lowered car, do so only at your discretion and be mindful of road hazards that would endanger a lowered car. Unlike other cars, the Tesla's battery pack is one of the lowest parts of the car - impacts, damage, or punctures will endanger the battery pack and or entire car itself. Height adjustment is therefore recommended to be done using spring preload only. While we have set our free length recommendations to protect the battery in most circumstances, lowering the car beyond the factory height must be done at the owners risk.

As the Redwood Ohlins DFV shocks have an additional method of adjusting ride height - by adjusting free length of the shock assembly - the installer setting up the car must be mindful of the ramifications of modifying these dimensions. Shortening the shock free length has the effect of lowering the car while preserving compression stroke, however, this will reduce battery-to-ground clearance during compression, and allow the wheel to travel further into the wheel well. For that reason Redwood Motorsports does not recommend reducing shock free length - only do so **at your own risk** for advanced setups - battery to ground clearance will be reduced and risk of battery damage and or potential for battery fire due to impacts will be increased.

Please keep in mind, all Redwood Motorsports adjustable suspension components such as our Camber+Caster FUCA, Rear Adjustable Camber and Toe Control Arms, sway bars, etc. are designed to be used in conjunction with the standard free lengths listed. Any deviation from these dimensions may cause damage or be incompatible with other components.

## Step 1: Remove frunk and associated covers

There are 7 bolts that hold in the frunk and two panels held in by plastic snaps.

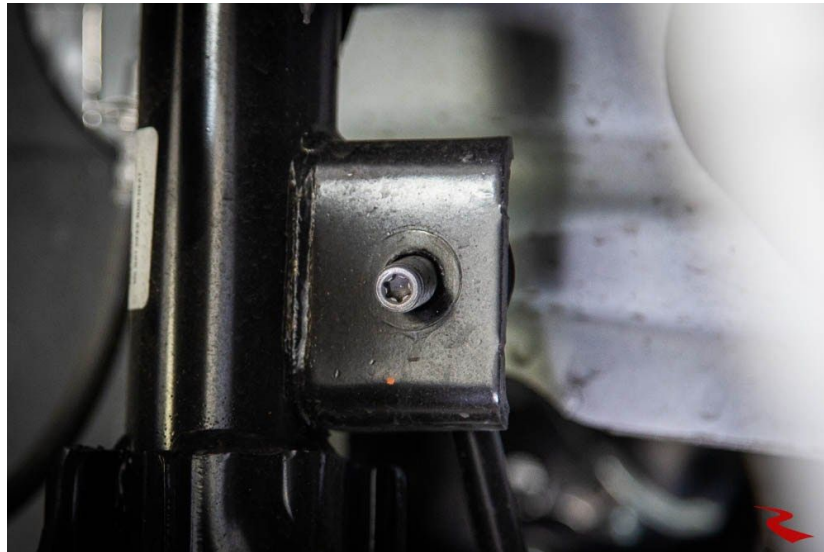
- Remove everything from the frunk.
- Remove the cowl area cover and the intake for the cabin air filter by pulling it up and away from the frunk and the cowl - these are both held in by snaps that will come undone with a bit of a tug.
- Remove the cover around the frunk latch so you can get at the bolts underneath.  
\*Note: There is an electrical connector to the internal frunk release on this panel, unplug that and set aside for now.
- Remove the two bolts near the frunk latch.
- Remove the two bolts on the frunk floor, and then remove the two bolts around the rim of the frunk closest to the passenger side - under the two flip open access points.
- Lastly unbolt the frunk panel from the windshield washer reservoir.
- Starting back by the cowl simply pull up on the frunk to pop loose all the plastic clips still holding it in place. Pick up the frunk and place it out of the way.
- Next, remove the two water guards from on top of the front strut towers. They are rubber pieces on either side that have two plastic rivets holding them in place. Simply pop up the center section of the two plastic rivets and then remove them and the covers will come off.
- With the covers removed, you will see one plastic rivet on either side holding the bottom of the cowl down to the strut tower, both of these must be removed as well.

## Step 2: Lift the vehicle, and remove OEM shocks/springs

### Front:

- Safely lift the vehicle, using factory lifting points, and remove wheels.
- Remove the anti-sway bar end link from both **front** struts.

**\*Note:** The stock sway has bonded bushings so removing the second one can be slightly troublesome, but the weight of an approximately 200lb person leveraging the sway bar is about right to get the hole lined up and the end link removed easily.



- Using a torx bit, undo the pinch bolt attaching the front knuckle to the upper control arm. Remove the bolt and tap up on the control arm to get the upper ball joint out of the socket in the front knuckle.



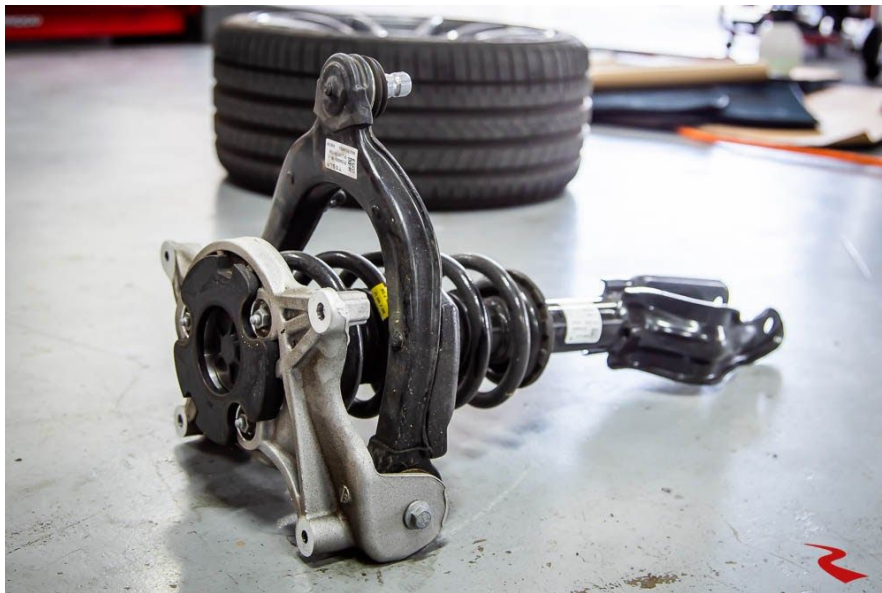
- Once this is loose you have plenty of room to remove the ABS sensor wire from the upper control arm. Disconnect this from the control arm completely as the front upper control arm will be removed with the front strut.
- Now, remove the front lower shock bolt going through the lower control arm.



- With the previous parts removed, we will go back to the top of the front shock tower to prepare to remove the shock, upper control arm, and the carrier as one assembly.

**\*Note:** Before doing so, it is wise to mark the location of a couple of the bolts that secure the assembly to the chassis. The holes have some slop so if you do not mark them now when you reinstall your suspension the front alignment may be slightly off.

- With the bolts marked such that you will be able to reinstall the carrier in the same position later, remove the 4 bolts on each side that hold in the upper control arm/strut carrier. One of these bolts is just a bit under the cowl, and one is a bolt that secures the front strut brace.
- While it is possible to remove the entire shock assembly without removing anything else, we recommend disconnecting the brake line holder from the front knuckle, which leaves you with a bit more room making removal easier.
- You can now remove the strut/carrier/FUCA assembly. Simply push the knuckle as far forward as you can and maneuver the assembly carefully out of the wheel well.
- With the assembly out of the car, remove the three bolts securing the strut top hat to the carrier. Set the carrier aside.

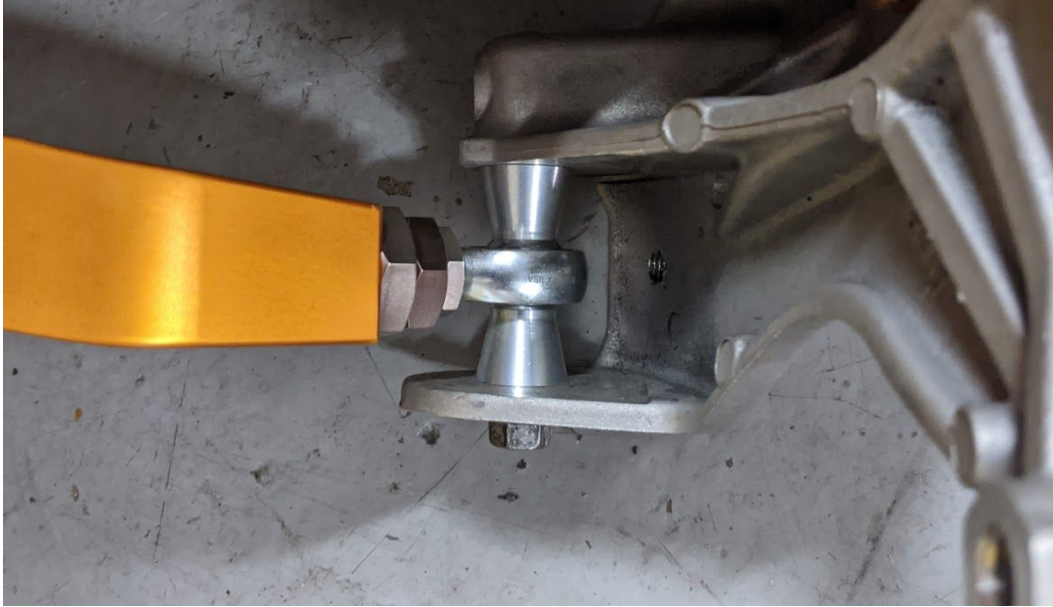


**Step 3:** Remove the stock upper control arm by removing the 2 13mm bolts that secure the arm to the carrier.

**Step 4:** Now that you have the stock control arm out it is time to prepare the new control arm for installation. First you will need to “zero” the adjusters on the arm. This ensures that proper thread engagement is maintained and that the front and rear legs of the arm have the maximum adjustment range. In order to do this you will need to thread both the rod end all the way into the adjuster sleeve and the adjuster sleeve all the way into the arm as shown.



With all the threads all the way in you will then hold on to the arm and turn the rod ends the shortest direction so that the holes through the rod end are in the same plane as the arm as shown.



**Step 5:** Install the arm to the carrier while being careful to not let the adjusters or rod ends turn and “un-zero”. **Note:** The side of the arm with the 2 tabs for the wheel speed sensor goes towards the front of the car. Re-use the stock attachment bolts and torque to factory specification. Once the arm has been installed on the carrier the adjuster can be turned without worry, as this will no longer affect the zero of the adjuster.





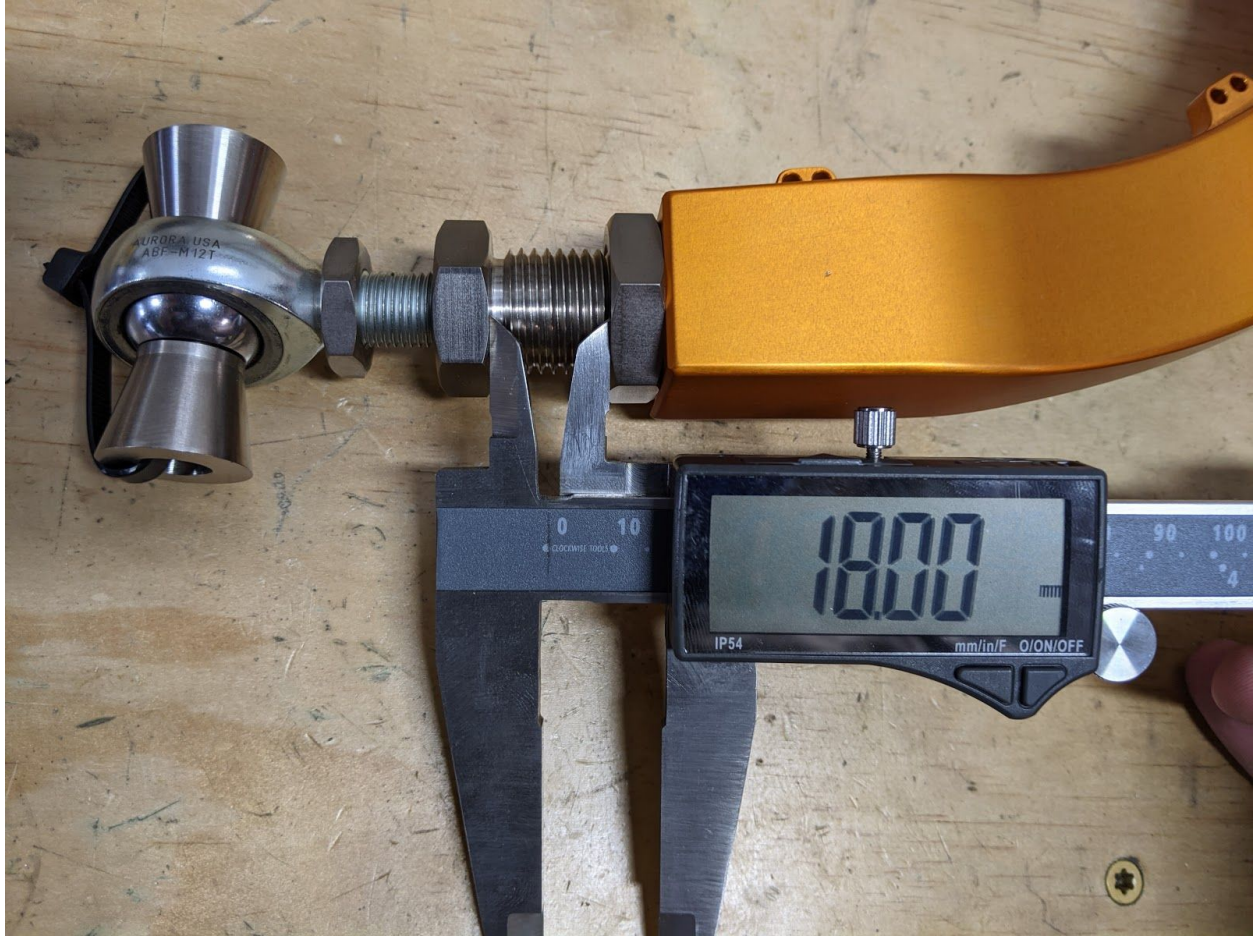
**Step 6:** Reinstall the arm/carrier/shock assembly into the car. This is simply the reverse of removal with a couple small changes. First, the arm is a tempting handle to lift the suspension by, but there is now a pinch point in between the arm and the carrier because of the switch from rubber bushings to spherical rod ends so be wary of lifting by just the arm.



When securing the control arm and shock upper mount carrier to the chassis there is some slop in the bolt holes in the chassis. This slop is to give the car some small amount of adjustability from the factory, but with our arm installed it will no longer be used so push the carrier toward maximum negative camber as you tighten down the bolts to factory torque specs. Next after loosely bolting the shock lower mount and connecting the control arm and the upright, adjust the grommets on the wheel speed sensor wire so they line up with the tabs on the upper control arm but do not zip tie them yet, the grommets slide without too much effort. You will need to do a final clearance check after the alignment so you will need to cut these off if they are put on at this stage. Once these lines are adjusted, bring the wheel to ride height and torque the lower shock bolt to factory specification.



**Step 7: Alignment.** Alignment of these arms is most easily done with the front axle jacked up and with 19mm, 24mm, and 27mm crow's foot wrenches on a LONG extension. Care must be taken while tightening the lock nuts down so that the rod ends remain vertical in line with the spacers and the bolt securing them. Next, during the alignment, it is extremely important that there not be more than 18mm in between the lock nut for the adjuster and the adjuster nut facing face of the adjuster flats. Measurement taken as shown. If you exceed this measurement serious damage to the chassis or arm may ensue. Even sticking to this measurement -1.5 deg camber should be possible.



After the alignment is completed jack up the front end, disconnect the arm ball joint from the upright, and go through the arm travel. Make sure that the arm does not interfere with the chassis at the outermost section of the ball joint housing. Both the rounded portion of the chassis shown here and the rib above it can contact the arm if it is extended too far. Contact here can lead to damage to the chassis or the arm and can be extremely dangerous.



Now that you have ensured that there are a couple mm at least in between the tip of the arm and the chassis you can use the provided zip ties to secure the grommets on the wheel speed sensor to the arm, and re attach the ball joint to the upright.

You have now finished installing your Redwood Motorsports Tesla Model 3 Ohlins. We're more than sure you'll enjoy the new experience that Ohlins has to offer.

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