



4" DualSport Suspension

Ford Superduty F250/350

NEW PRODUCT

Please visit www.aev-conversions.com to view the most current installation guide for this product.

This is a new product and we want to make sure that you receive the latest and most accurate information based on customer feedback, product revisions, and/or model year updates. We value customer feedback, so we encourage you to contact our Technical Support department if you have any suggestions on how to make the installation of this product easier or if you have any questions regarding the installation of this product. AEV's Technical Support can be reached by email at tech@aev-conversions.com or by giving us a call at (248)-926-0256.



PLEASE READ BEFORE YOU START

To guarantee a quality installation, we recommend reading these instructions thoroughly before beginning any work. These instructions assume a certain amount of mechanical ability and are not written nor intended for someone not familiar with auto repair.

INCLUDED PARTS	QTY	REQUIRED TOOLS
Radius Arm Relocation Kit	1	Common Hand Tools
Track Bar and Pitman Arm Kit	1	½" Drill Bit
ConBox	1	Cutoff Wheel
Front Coil Spring Kit	1	Bench Vice
Shock Kit	1	Blue Threadlocker
Rear Lift Block Kit	1	Torque Wrench



***Before beginning the installation, print out the AEV Bump Stop Trim Template found on the AEV Ford Super Duty 4" DualSport Suspension webpage. Ensure you have all part kits listed above and the required tools before you begin.**

Front Suspension

1. Remove power steps if the truck is equipped with them. Set hardware aside for reinstallation.
2. Lift vehicle by frame and remove wheels.
 - a. NOTE: If truck is equipped with factory Ride Height Sensors (Platinum trims come standard with these), these can be removed and will later be reinstalled with the supplemental AEV Ride Height Sensor Relocation Kit. It is important to label the RH and LH sensor that you remove so that during reinstallation they go back onto the correct side of the truck.
3. Support front axle with transmission jack.
4. Remove the brake line bracket attached to the axle spring perch, let it hang loose. Clip off the zip ties connecting the brake line and ABS line. Do this on both sides of the truck.

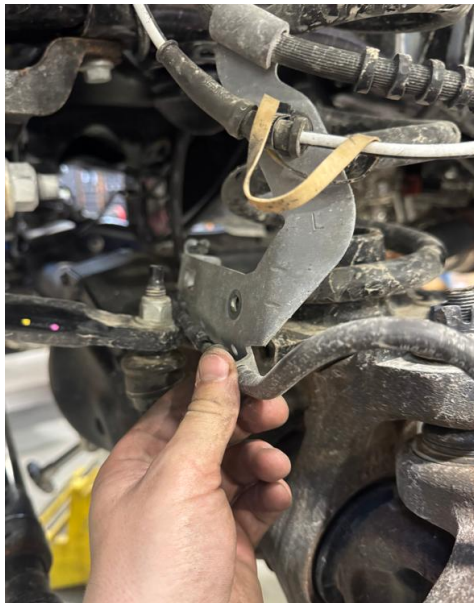


Figure 1



5. Remove the fir tree clips securing the 4WD Hub vacuum line to the radius arm on the driver side of the vehicle.



Figure 2

6. Disconnect front drive shaft at front pinion yoke. Remove the bolts attaching the U-joint clamps and save the hardware and clamps for reinstallation. Mark the orientation of the drive shaft to the pinion yoke using a paint pen so during reinstallation you reattach it at the same orientation as before. It is recommended to put tape around the U-joint bearing caps to ensure the needle bearings do not come out.



Figure 3



7. Remove the factory Steering Stabilizer from the vehicle. Set hardware aside for later use.
8. Remove the factory bump stops from the vehicle. Pull out the rubber stop from the bump stop cup and remove the bolt that secures the bump stop to the frame. Save the rubber bump stop and metal cup for later use, the bolts can be discarded.
9. Disconnect the track bar from the frame-side track bar bracket. Set hardware aside for later use. The axle side of the track bar will stay attached.



Figure 4

10. Remove the drag link nut and disconnect the drag link from the pitman arm. Set nut aside for reinstallation. The axle side of the drag link will stay attached.

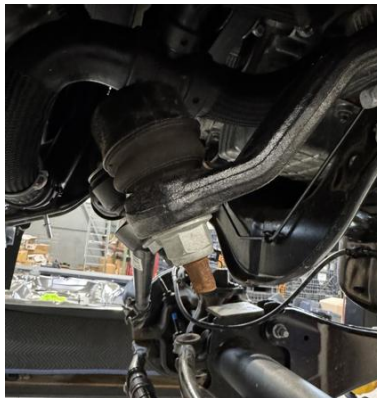


Figure 5

11. Remove the front upper sway bar end link nuts to free the sway bar from the end links.
12. Ensure the axle is supported by jack or jack stands and remove the factory front shocks from both sides of the vehicle. Save hardware for later use.



13. Lower the axle and remove the factory springs from the vehicle and set the rubber coil spring isolators to the side for later use. By freeing up the axle to now be lowered further, you have more room to work while removing the pitman arm with a pitman arm puller. NOTE: While lowering the axle, ensure all brake, vacuum, and vent lines are disconnected from the fir tree clips/brackets attached to the axle to give enough slack in the lines while at droop.
14. Remove the factory track bar frame side bracket from the vehicle. Set hardware aside for later use.



Figure 6

15. With the steering wheel centered, mark the sector shaft and gear box housing with a paint pen. This will help orientate the new pitman arm when it is installed later.
16. Pitman Arm Installation

- a. Remove the sector shaft nut securing the pitman arm to the steering gear sector shaft. Using a pitman arm puller, free the pitman arm from the sector shaft. Discard the factory sector shaft nut; a replacement nut is provided in the AEV kit.

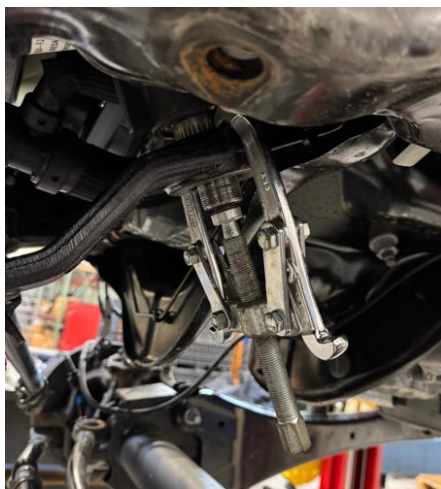


Figure 5



- b. Take the new AEV Pitman arm and align the index splines on the new pitman arm with the sector shaft splines, ensuring the arm is in the same orientation as the factory unit. Push the Pitman arm fully onto the sector shaft splines.
- c. Thread the provided replacement sector shaft nut onto the shaft.



Figure 6

- d. Check that the Pitman arm is fully seated on the tapered splines and that the sector shaft nut is threaded onto the shaft correctly. Then torque to 350 ft-lb.
-
17. Once the pitman arm is installed and torqued to spec, locate the new AEV frame-side track bar bracket. Re-use the M12 bolts and flag nuts that were removed from stock bracket to reattach the AEV bracket to the frame rail. Locate the track bar spacer with three holes and use the three provided M14 x 60mm bolts, washers and nuts to secure the spacer between the bracket and frame cross member. Loose install all bolts first to make sure all holes and hardware align.



Figure 7

18. Install the new AEV bump stop spacer between the new AEV track bar bracket and frame rail. Take the metal bump stop cup that was previously removed and install on the bottom side of the track bar bracket as shown. Make sure the bump stop cup alignment tab is located to the clearance hole on the new AEV track bar bracket. Use the provided M8 x 100mm bolt and washer to secure the bump stop to the frame. Torque M8 bolt to 18 ft-lb. Reinstall the rubber bump stop to the metal cup by firmly pushing it into place.



Figure 8



19. Once the bump stop is installed, the remaining track bar bracket bolts can be torqued to spec, the M14 crossmember bolts will be torqued to 130 ft-lb and the M12 bolts in the frame rail will be torqued to 85 ft-lb.
20. On the passenger side of the vehicle, remove the three motor mount nuts shown in the image below. Once removed, place the new AEV bump stop support bracket over the motor mount studs, loosely secure the nuts back onto the motor mount studs.

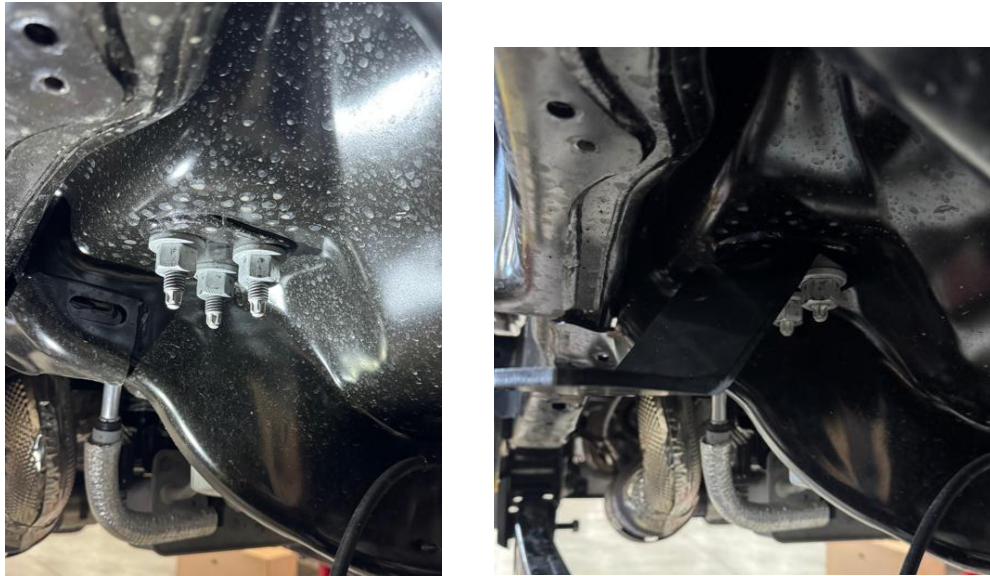


Figure 9

21. Take the metal bump stop cup and using the AEV Bump Stop Trim Template (found on AEV Ford Superduty Suspension Webpage to print), align the template to the bump stop cup's locating tab. Mark the trim location shown on the template. Remove the template and cut the metal cup along the trim line using a cutoff wheel. Treat the cut edge with rust preventative. NOTE: This step is needed on the passenger side bump stop cup as some vehicles may have clearance issues while the axle is at droop on a 2-post lift with the new AEV springs installed.



Figure 10

22. Place the AEV bump stop spacer between the frame and support bracket already installed. Place the trimmed metal bump stop cup on the bottom side of the support bracket, ensuring the locating tab on the top of the cup aligns with the locating slot on the support bracket, and secure to the frame using the provided M8 x 110mm bolt and washer. Once loose installed, torque the motor mount nuts to 110 ft-lb and M8 bolt to 18 ft-lb. Reinstall the rubber bump stop onto the metal cup once bolts are torqued.

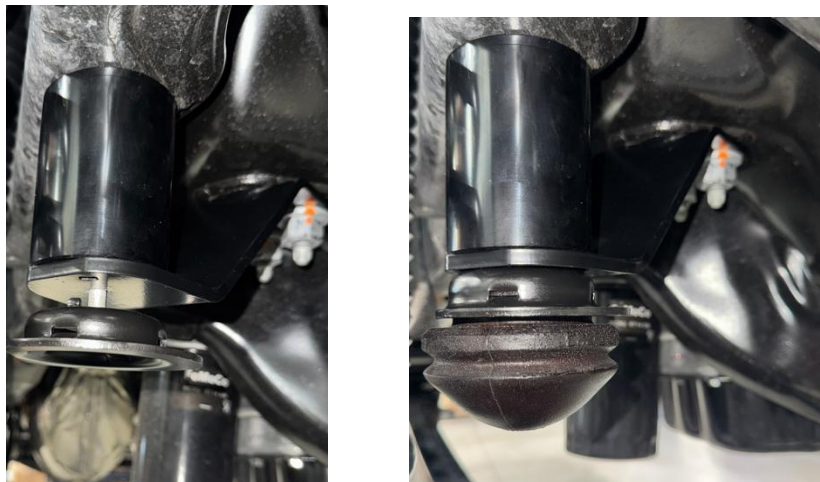


Figure 11



23. Radius Arm Relocation Brackets

- a. Work on one side of the vehicle at a time. Complete full relocation bracket installation on one side before moving on to the other side.
- b. Remove the frame-side radius arm bolt from the factory radius arm bracket. Set hardware aside for later use.



Figure 12

- c. Lower the axle using the trans jack. Lower the axle enough so that the radius arm is no longer in the factory radius arm frame bracket.
- d. Locate the factory hole shown below that was previously unused on the radius arm frame bracket. Drill the outboard and inboard hole that is directly in line with this on the inboard frame bracket to $\frac{1}{2}$ ". You will need to run a drill bit through the existing hole on the outboard bracket to reach the inboard hole. Treat with rust preventative. NOTE: On the passenger side of the vehicle, be careful not to drill too far past the inboard frame bracket as the exhaust is close to this inboard frame bracket.

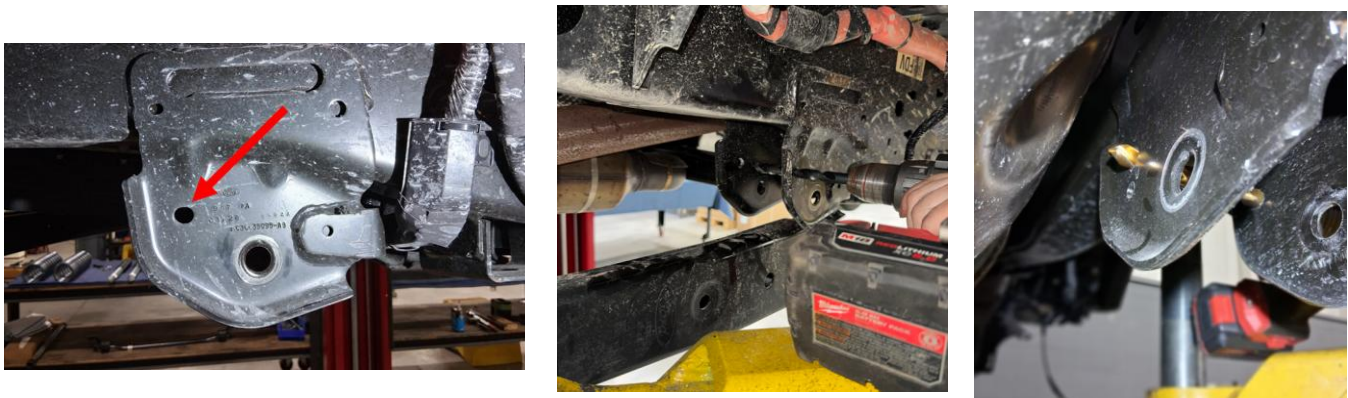


Figure 13



- e. Locate the new AEV Radius Arm Relocation Brackets. Ensure you have the correct bracket for each side of the vehicle.

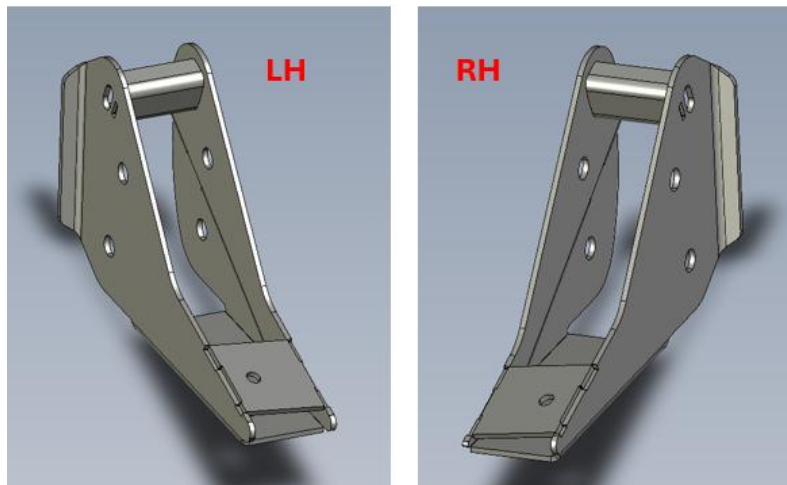


Figure 14

- f. Place the new AEV bracket into position by sliding it up into the factory radius arm frame bracket.

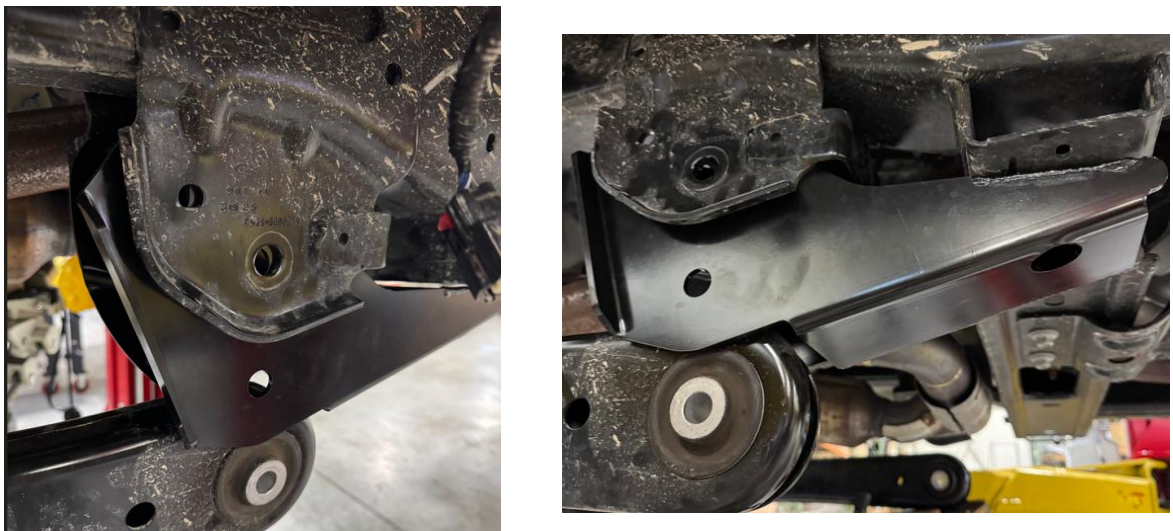


Figure 15



- g. Place the provided radius arm crush sleeve inside the bracket and align it to the factory radius arm hole. Insert the provided M18 x 130mm bolt and washer through the stock radius arm bracket hole and crush sleeve. Loosely secure with the provided M18 nut and washer.



Figure 16

- h. Rotate the bracket into position and place a provided M12 x 120mm bolt into the new 1/2" hole that was drilled in prior steps. Loosely secure with provided M12 nut.



Figure 17



- i. Locate the provided radius arm spacer puck and align this on top of the rearward stock frame bracket hole as shown below. Using a provided M12 x 35mm bolt and washer, feed this up through the AEV bracket and loosely secure with M12 nut on top of the spacer puck as shown.



Figure 18

- j. Align the radius arm to the new AEV radius arm bracket lower attachment hole. Once aligned, place the previously removed M18 radius arm bolt through the bracket and radius arm, loosely secure with m18 nut previously removed.



Figure 19



- k. Once all hardware is installed and the AEV bracket is in position, torque the middle M18 bolt to 240 ft-lb, and the M12 bolts to 80 ft-lb. Do not torque the M18 bolt attaching the Radius Arm to the AEV bracket until the vehicle is at ride height.
- l. Install the opposite side radius arm bracket using the same procedure.

24. Caster Alignment Sleeve

- a. Locate the factory caster alignment sleeve on the upper ball joint stud of the steering knuckle. Remove the cotter pin and castle nut securing this sleeve to the ball joint.



Figure 20

- b. Remove the factory caster sleeve. To assist, you can use an air hammer on the side of the sleeve, angled upwards, to carefully break it loose from the ball joint.



Figure 21



- c. Once removed, install the AEV provided sleeve. It is recommended to put a small amount of grease on the sleeve to aid installation. Ensure proper alignment with the split side of the sleeve facing rearward and carefully insert the sleeve. You can use a mallet to aid pressing the sleeve into position, but be careful to not damage any mating surfaces. Once in place, reinstall the castle nut and torque to 69 ft-lb. Install the provided cotter pin.



Figure 22

- d. Repeat process on opposite side of vehicle.

25. Front Track Bar

- a. Align the track bar to the new AEV track bar bracket and install the bolt through the front of the bracket so that the threads are facing rearward. Secure with the nut that was previously removed. To assist, raise the axle until the track bar aligns to the new track bar bracket attachment hole. Do not torque to spec until the vehicle is at ride height on the ground.



26. AEV Front Coil Springs

- a. Locate the AEV provided front coil springs and place the rubber spring isolator previously removed on the top of the new spring. The narrow (smaller diameter) end of the coil spring will be the bottom side of the spring that will onto the axle spring perch. Ensure the isolator is seated properly at the top of the spring with the molded 'stop' pressing against the end of the spring pigtail.
- b. Place the new spring and isolator into position on top of the stock axle spring perch.



Figure 23

- c. Rotate the spring so that the lower spring pigtail is resting against the axle spring perch stop.
- d. Do this on both sides of the vehicle while the axle is lowered.
- e. Once both springs are in place, using the trans jack, lift the axle slowly, checking that the spring seats properly to the upper spring mount.



27. Front Shocks

- a. Locate the AEV front shocks, part number 24-368742. Remove the hardware from the box and find the rubber bolt sleeve shown below. Take the loose metal bushing sleeve and press it into the rubber sleeve as shown.



Figure 24

- b. Slide the metal plate and then the rubber sleeve over the top of the bolt as shown.



Figure 25

- c. With the axle still supported and lifted enough to keep the springs seated, install the new AEV front shocks. Using the provided hardware, feed the upper shock stud and lower bushing/sleeve through the frame hole. Then place the upper half of the rubber bushing and the second cupped washer onto the stud followed by the provided nut. Loosely secure the nut.



Frame sits between these two halves of the bushing shown in image.



Figure 26

- d. Using the bolt and flag nut previously removed from the stock shock lower mount, secure the lower shock end to the lower axle shock mount.
- e. Torque the upper shock mount to 46 ft-lb and the lower shock mount to 111 ft-lb.

28. Reinstall the drag link to the AEV pitman arm. The drag link will be flipped from its stock position, so the stud should now be facing upward through the new pitman arm. Loosen the drag link sleeve towards the axle end of the link to rotate the drag link into this position. Place the drag link stud up through the pitman arm tapered hole and reinstall the nut that was previously removed and torque to 70 ft-lb.



Figure 27

29. AEV Steering Damper Relocation

- a. The factory steering damper will be re-used for this kit.



- b. Take the stock damper and grind off the stud retention plate on the backside of the stud. The stud will need to be pressed out of the bushing to replace with a metal bushing sleeve.
- c. Once the retention plate is ground down enough, the plate should be able to be pried off.



Figure 28

- d. Using a vice, place a socket adaptor (or similar shaped tool) on exposed backside of the ball stud. Tighten the vice as shown, keeping the socket adaptor tight to the stud, and place the opposite clamp edge of the vice onto the metal shock mount as shown. Slowly tighten the vice, pushing the stud out of the bushing.

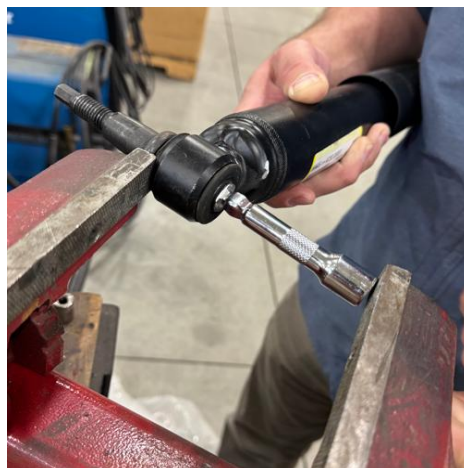


Figure 29



- e. Once the stud is removed, ensure the stock rubber bushing is seated and centered in the shock end. You can use a socket and vice to press the bushing back in if needed. It is recommended to use lubricant to assist pressing the bushing back into position.



Figure 30

- f. Locate the AEV provided metal shock bushing sleeve. Add lubricant to the rubber bushing and use the vice to press in the new sleeve. A large socket on the backside of the bushing can be used to aid this process as shown. If the bushing slips partially out of position while installing the sleeve, you can re-center it by clamping the sleeve in the vice and rocking the damper body back and forth to work the bushing back into position.



Figure 31



- g. Once the steering damper sleeve is installed and ready, locate the AEV machined steering damper relocation block. Loose install the relocation block to the drag link, there is a notch in the bottom of the block that will face towards the passenger side of the vehicle on the drag link. Using the provided M14 x 45mm flange bolt; install the bolt on the underside of the drag link hole and thread into the relocation block. Take the steering damper and using the end you had just installed the new sleeve in, use a provided M12 x 55mm bolt and washer to loosely secure the damper to the top of the steering damper block. Use blue thread locker on the two bolts.

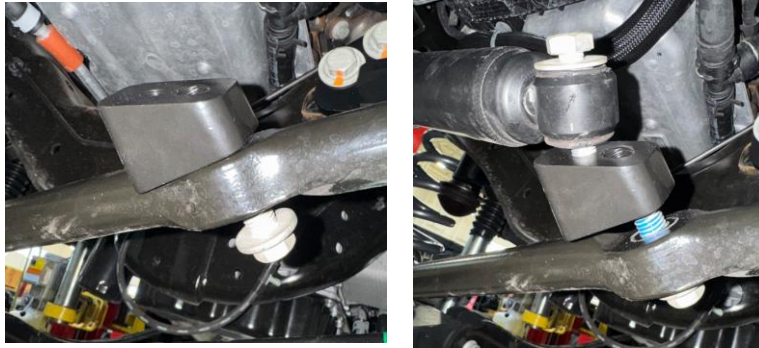


Figure 32

- h. With the damper loosely secured to the relocation block, secure the opposite end of the damper back to the frame in the original location using the M12 bolt that was previously removed.



Figure 33

- i. With all bolts in place, torque the M14 bolt first at the relocation block to 100 ft-lb. Then torque the M12 bolts at the frame end and relocation block to 80 ft-lb.



30. Front Sway Bar

- a. At this point, the front sway bar should be loose from the factory end links. Remove the sway bar at the frame by removing the saddle bushing nuts from the frame side retainer bolts.
- b. Remove the factory spring clip bolts from the frame and discard.
- c. Locate the two AEV sway bar retainer brackets and sway bar spacers. Using two of the provided M10 carriage bolts per side, place one carriage bolt into the square hole of the retainer plate as shown. Slide the retainer plate into the forward keyhole with the open-ended side of the bracket moving to the rearward keyhole as shown.



Figure 34

- d. Take the second carriage bolt and feed it up through the rearward keyhole. Rotate the plate to lock in the rearward carriage bolt to the slotted plate.



Figure 35



- e. Place the provided AEV sway bar spacer blocks over the top of the bolts, ensuring to keep the bolt tight to make sure the retaining bracket does not rotate. Place the sway bar saddle bushing back over the top of the new bolts and secure with provided M10 nuts. Use blue threadlocker and torque to 35 ft-lbs. Proceed with the same steps on the opposite side of the sway bar. Once installed, lift the axle enough to install the sway bar back onto the sway bar end links using the previously removed nuts. Torque to 59 ft-lb.



Figure 36

31. Front Brake Lines

- a. To minimize the loss of brake fluid, it is recommended to start by clamping the factory soft line near the caliper bolt connection. Remove the banjo bolt and soft line from the caliper. Route this soft line up high and secure out of the way while moving to frame side brake line attachment.



Figure 37



- b. Remove the soft brake line from the frame side brake hard line by loosening the hard line nut. Once loose, remove the brake line retaining clip and pull the soft line from the retaining bracket on the frame. Cap the hardline to keep the brake fluid from leaking and keep the soft line elevated to control the brake fluid from leaking.

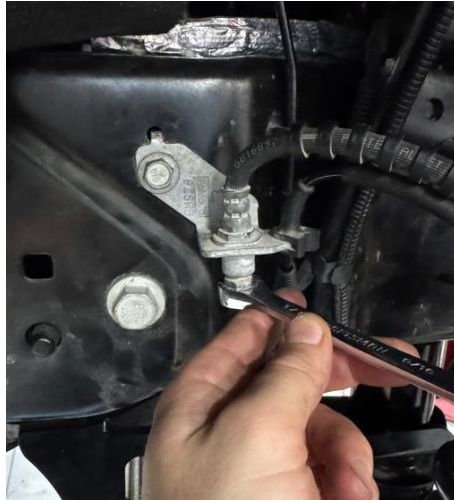


Figure 38

- c. Take the stock soft line and remove the factory banjo bolt from the fitting. You may need to pry off the old copper crush washers, AEV provides new crush washers in the kit so don't worry about damaging the old ones when removing the banjo bolt.
- d. Take the new AEV soft brake line and ensure you have the correct RH or LH line, the attachment brackets are unique to each side of the vehicle. See figure below, the bracket on the AEV soft lines have part numbers that designate RH and LH. (DB26 – Driver/LH side of vehicle; PB26 – Passenger/RH side of vehicle)



Figure 39



- e. Attach the new AEV line to the caliper using the banjo bolt you just removed and place new copper crush washers on either side of the banjo fitting. Ensure the metal brake line bracket is in the proper orientation. Torque to 35 ft-lb.



Figure 40

- f. Attach the new AEV brake line to the hard line at frame side. Install the new retaining clip and thread the hard line tube nut into the new fitting using a flare nut wrench. Do not over torque the fitting, you only need approximately 12-18 ft-lb to create a sufficient seal. Ensure you clock the new brake soft line hose towards the coil spring as best you can before torquing down nut to keep the brake line out of the tire sweep.



Figure 41



- g. Secure the new brake line retaining bracket to the spring perch using the hardware that was removed from the stock bracket.

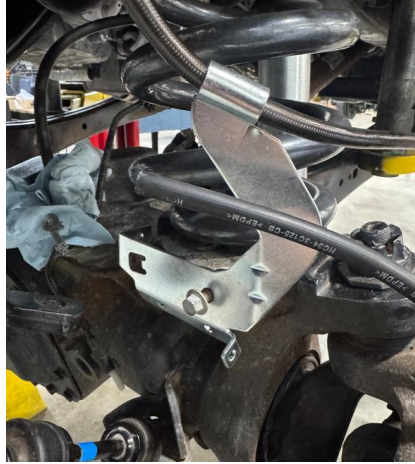


Figure 42

- h. Remove the ABS line from the frame side retaining bracket. Flip the line so that the plastic protection sleeve is facing upwards and re-attach to the retaining bracket. This adds extra slack to the ABS line to account for the new lift height.

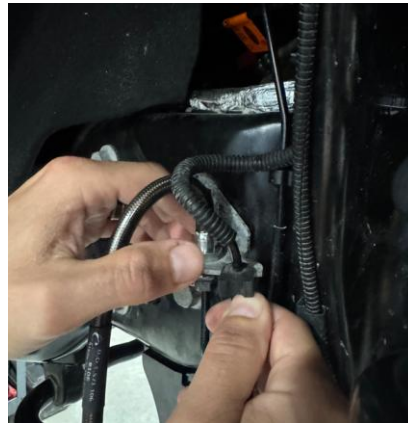
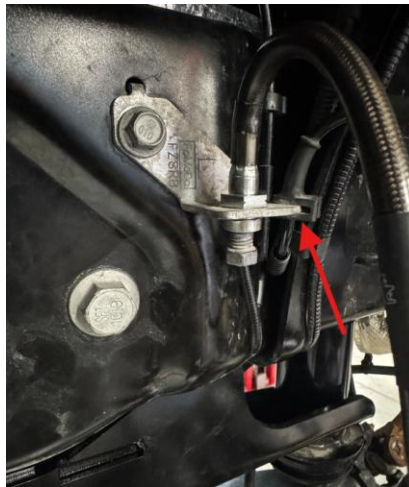


Figure 43



- i. Use provided cable ties to secure the ABS line to the new brake soft line in the positions shown. Before fully tightening the cable ties, the brake hose can be slid up or down within the metal bracket; ensure it has enough slack on both ends to account for suspension travel and steering.

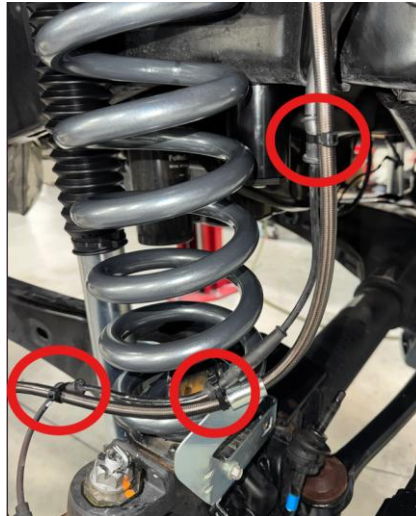


Figure 44

- j. Proceed to the opposite side of the vehicle and install the brake line using the same procedure. Once suspension installation is complete, bleed the brake lines starting at the right front, then proceed to the left front. Add additional brake fluid if needed, reference your trucks owner's manual for the correct fluid for your vehicle.
32. Disconnect and remove the stock 4WD hub vacuum line from the passenger side of the vehicle. This line is clipped to the frame cross member and runs to the passenger steering knuckle; remove the line at the fitting that was attached to the factory brake line bracket as shown. Pull the two rubber ends while gently twisting and the barbed fitting will release.



Figure 45



33. Locate the longer 28" AEV provided vacuum hose and attach this at the same point you just disconnected the old one from; you will reuse the plastic connector fitting from the factory line you removed. Carefully remove the white fitting and insert this into one end of the new provided vacuum line. Attach this to the new AEV brake line bracket as shown.

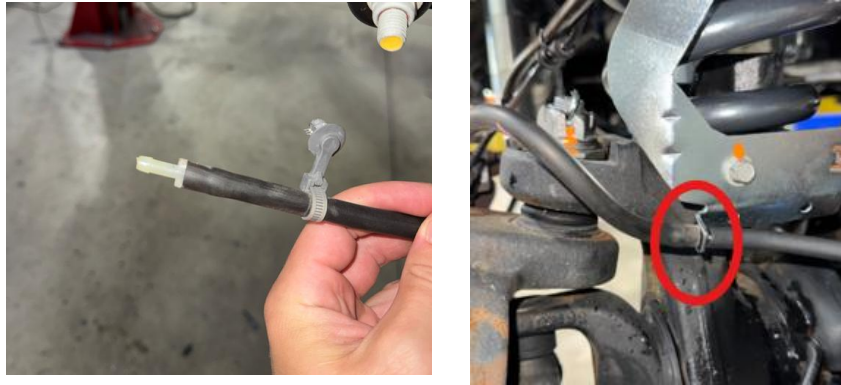


Figure 46

34. Now disconnect and remove the factory 4WD vacuum line from the frame side fitting as shown below. You can remove the factory fir tree clip connecting the line to the frame. Reusing the fitting, connect the new 28" vacuum line to this fitting.

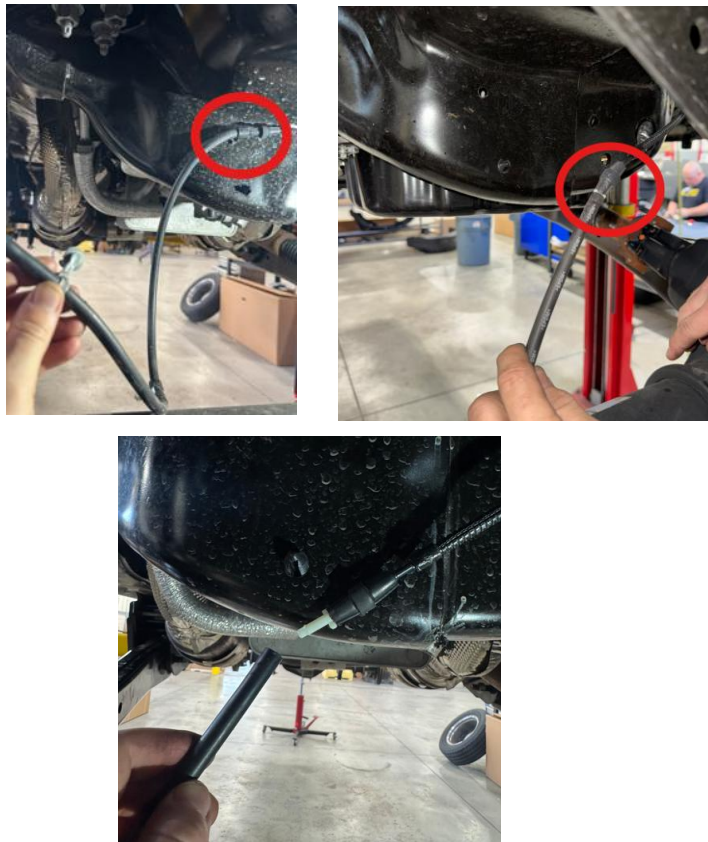


Figure 47



35. Use the provided larger fir tree cable tie to reattach the vacuum line to the frame.



Figure 48

36. Use a smaller fir tree cable tie provided and secure the new vacuum line to the axle bump stop bracket in the factory location previously used. Ensure there is some slack in the vacuum line from this attachment to the frame fir tree clip, you do not want the line to be too tight.



Figure 49



37. Moving to the driver side of the vehicle, locate the 4WD hub vacuum line going to the driver side steering knuckle. The upper portion of the rubber line going to the frame will be replaced with the shorter 18" vacuum line provided in the kit. The left figure below shows the line that is being replaced. Remove this line from the fitting on each end. If one of the fittings comes out with the factory line being replaced, remove it and insert it into one end of the new vacuum line. Once installed, use a provided larger fir tree cable tie and secure the lower fitting connection to the hole on top of the radius arm that was previously used.

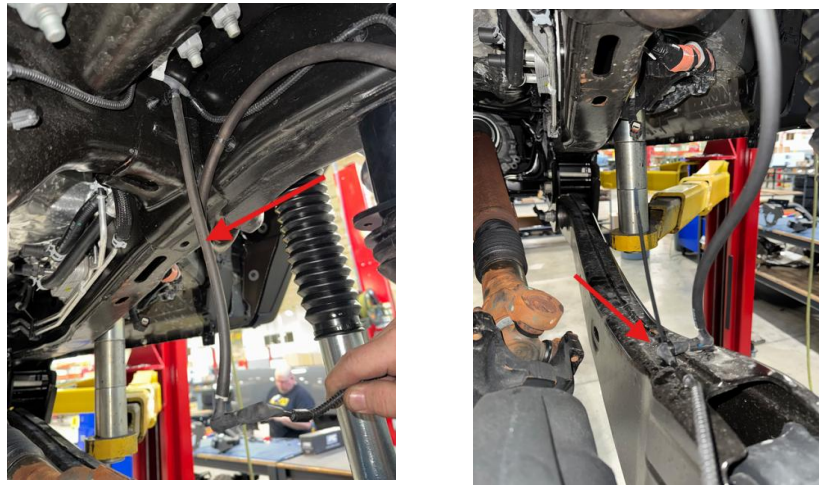


Figure 50

38. Locate the front axle vent hose that comes off the axle by the differential and is attached to the frame by a fir tree clip on the driver side of the vehicle. Remove the fir tree clip attaching this hose to the frame. Add another smaller fir tree cable tie provided in the kit to this hose and secure it to the attachment hole in the AEV track bar bracket, above the frame side bump stop cup. Ensure there is enough slack between the new attachment point and the axle attachment for full droop of the suspension.

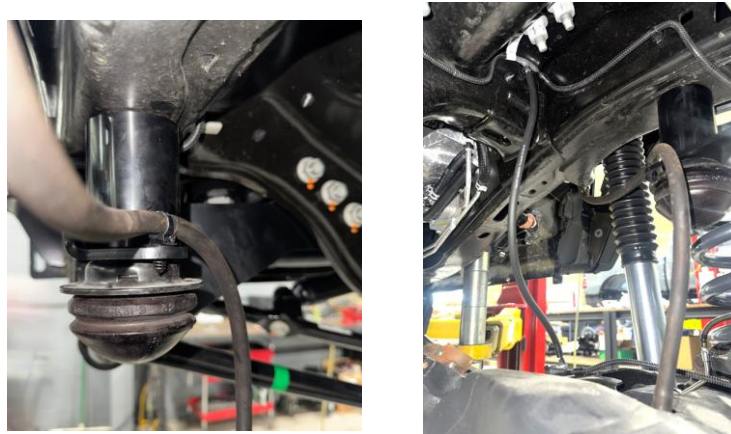


Figure 51



39. Lastly, re-secure the 4WD vacuum line by the driver side knuckle back to the new AEV brake line bracket.



Figure 52

40. Reconnect the front driveshaft to the pinion yoke. Reinstall the U-joint clamps previously removed with the factory hardware. Apply blue threadlocker and torque the clamps to 26 ft-lb.
41. Front suspension is complete. Once at ride height, torque the front radius arms and track bar to specifications found in the chart at the end of the installation sheet.
42. NOTE: If your vehicle was equipped from the factory with ride height sensors that you removed before starting the suspension installation, ensure you have the AEV Ride Height Sensor Relocation Kit and install the kit using the Sensor Relocation instruction sheet found on the suspension webpage.

Rear Suspension

1. Support the rear axle with trans jack.
2. Remove the factory shocks from both sides of the vehicle. Set hardware aside for later use.
3. NOTE: If you have factory equipped ride height sensors, remove the sensor bracket that sits on top of the leaf pack and save hardware. This can be re-installed once the new lift blocks and U-bolts are installed.
4. Working on one side of the vehicle at a time, remove the factory leaf spring U-bolts.



5. Slowly lower the axle using the trans jack. Remove the factory lift block. Locate the correct AEV lift block for the side of the vehicle you are working on. The lift block is labeled RH /LH and shows the direction with an arrow the block should be facing. The blocks are tapered, so ensure you are working with the correct block.



Figure 53

6. Lower the axle enough to place the AEV lift block into position on the factory axle pad. Begin lifting the axle, ensuring the lift block and leaf springs are sitting straight and aligned to the factory axle pad.



Figure 54



7. Install the provided AEV U-bolts, ensuring the bolts are sitting flush to the mount at the top of the leaf pack. Place the axle mounting castings previously removed over the ends of the U-bolts beneath the axle and secure with provided 5/8" flange nuts.

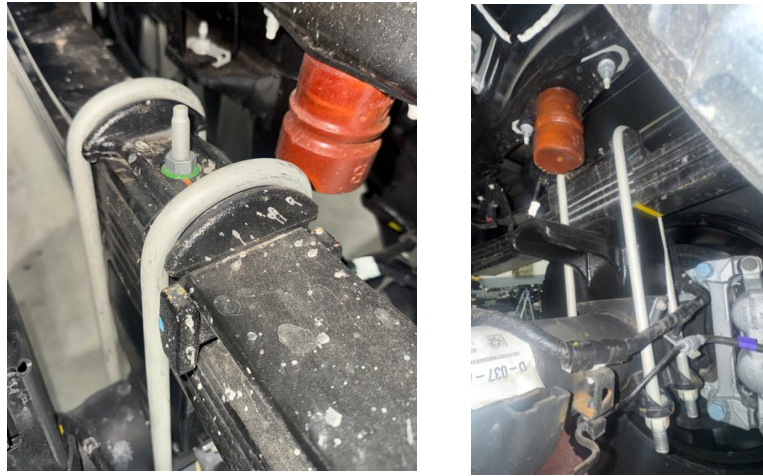


Figure 55

8. Begin tightening the U-bolt nuts in a criss-cross pattern in 3-4 progressive stages until you reach the final torque of 110 ft-lb on each nut.
9. Proceed to the opposite side of the vehicle and install the new lift block using the same steps.
10. Once complete, install the new AEV shocks (PN: 33-368757) using the factory hardware previously removed. Torque the upper shock mount to 52 ft-lb and the lower mount to 111 ft-lb.
11. NOTE: If your vehicle had factory ride height sensors, you can reinstall the sensor bracket back onto the top of the spring leaf pack.

Final Steps

1. Once the vehicle is back on tires at ride height, torque the front track bar and radius arms to specifications listed in the table below.
2. Take your vehicle to an alignment shop immediately after installation.
3. It is recommended to check and re-torque all newly installed AEV hardware after 500 miles of driving.
4. Ensure the front brake lines are not contacting other suspension components, tires, sharp points, or pinch points. If necessary, the upper portion can be clocked forward or backward by loosening the hardline connection and rotating the large nut on the soft line. Re-tighten once properly positioned, brakes may need to be re-bled at this point.



Torque Specifications

JOINT	TORQUE (FT-LB)
Pitman Arm to Sector Shaft	350
Drag Link to Pitman Arm	70
Track Bar to Frame Bracket	400
AEV Radius Arm Bracket M18 Bolts	240
AEV Radius Arm Bracket M12 Bolts	80
Radius Arm to AEV Bracket	240
AEV Track Bar Bracket to Frame M14 Bolts	130
AEV Track Bar Bracket to Frame M12 Bolts	85
Front Upper Shock to Frame	46
Front Lower Shock to Axle	111
Motor Mount Frame Bolts	110
AEV Bump stop to Frame	18
Caster Sleeve to Knuckle	69
Steering Damper Block M12 Bolt	80
Steering Damper Block M14 Bolt	100
Front Sway Bar to Frame	35
Rear Upper Shock to Frame	52
Rear Lower Shock to Axle	111
Rear Leaf Spring U-Bolts	110