



**IMPORTANT! READ THIS FIRST!**

Installation of shock absorbers or other suspension components requires special tools and expert knowledge. Accordingly, installation of all BILSTEIN products must be performed by a professional automotive suspension technician.

When replacing other brands, BILSTEIN shock absorbers or other suspension components should always be installed as a set. All BILSTEIN products must only be used for the specific, intended application as indicated in the application guide. **Any use of any BILSTEIN product other than for its intended use may result in serious bodily injury or death.**

Always use a chassis hoist for the installation of BILSTEIN products and make certain that the raised vehicle is securely attached to the hoist and/or supported to prevent the vehicle from slipping, falling, or moving during the installation process.

**If you install any BILSTEIN product without the necessary special tools, expertise, and chassis hoist, you may subject yourself to the risk of serious bodily injury or death.**

BILSTEIN shock absorbers are gas-filled and are highly pressurized.

- Never place any BILSTEIN shock absorbers in a vise or use a clamp on any BILSTEIN shock absorber.
- Never apply heat near any BILSTEIN shock absorber.
- Never attempt to open or repair any BILSTEIN product, in order to prevent **serious bodily injury or death.**

Any attempt to misuse, misapply, modify, or tamper with any BILSTEIN suspension product voids any warranty and **may result in serious bodily injury or death.**

While installing any BILSTEIN product:

- Do not use impact tools for loosening or tightening fasteners, because this may destroy the screw threads.
- Self-locking fasteners must only be used **once!**
- Reuse original equipment components only if they are in good condition, otherwise replace them with new components.
- Never remove the slight film of oil on the shock absorber piston rod and seal.
- All mounting fasteners for shock absorbers and other suspension components must be securely tightened before tension is placed on the suspension system, unless otherwise specified in the manufacturer's service manual or in this instruction.

After installing any BILSTEIN product:

- The suspension caster and camber must be checked and/or adjusted to comply with the vehicle manufacturer's specifications.
- The (load dependent) brake compensator and the anti-lock brake system must be checked and/or reset to comply with the vehicle manufacturer's specifications.
- The headlight aim must be checked and adjusted. Or, if applicable, adaptive headlights must be checked and recalibrated to comply with the vehicle manufacturer's specifications.
- If applicable, any/all Advanced Driver Assistance Systems (ADAS) must be checked and recalibrated to comply with the vehicle manufacturer's specifications.

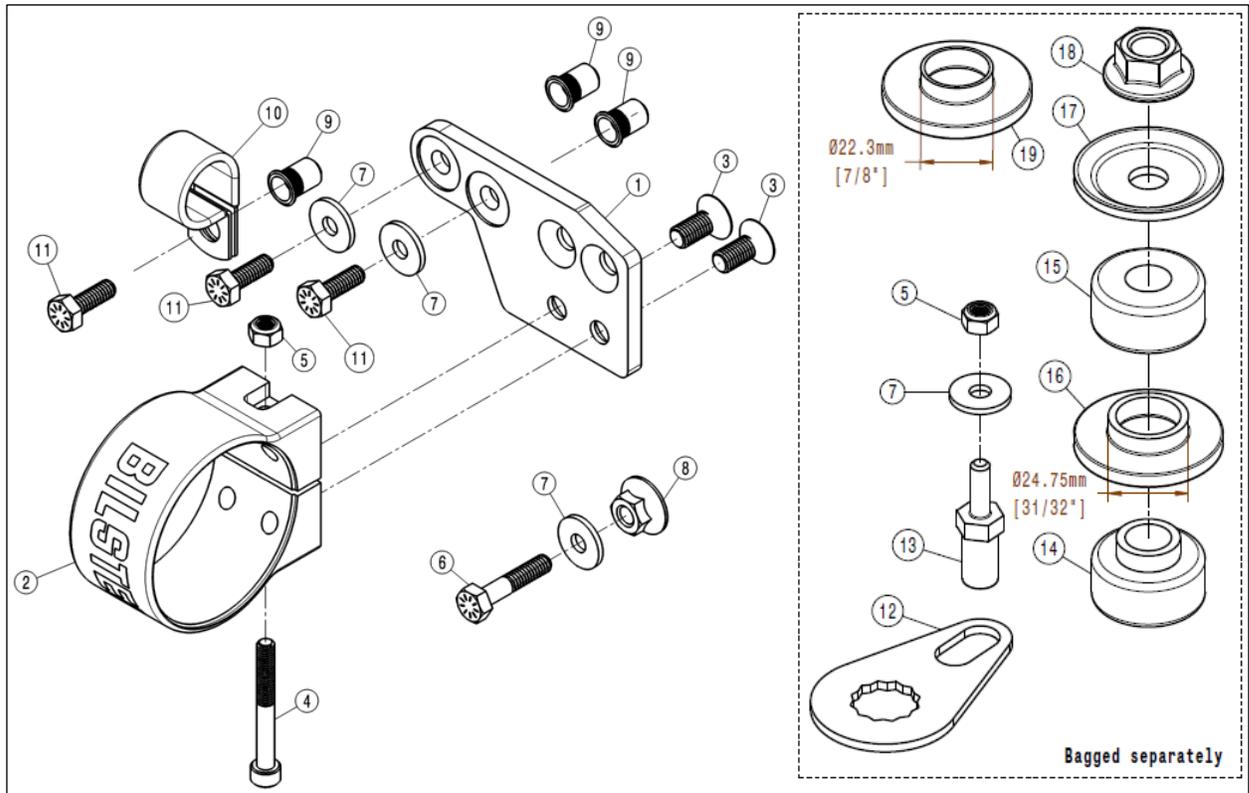
***CAUTION for COILOVER TYPE SUSPENSIONS!!!***

**If disassembling a coilover type suspension, refer to the vehicle manufacturer's service manual for proper procedures. The coil spring is preloaded and must be compressed with a spring compressor to release load before the upper mount is disassembled. Failure to follow the vehicle manufacturer's procedures may cause serious injury or death, and may damage the vehicle.**

***IMPORTANT!!!***

**This BILSTEIN product may or may not be compatible with non-BILSTEIN aftermarket products and/or vehicle modifications. It is the responsibility of the professional automotive suspension technician performing the installation to identify any non-OEM components and/or modifications on the vehicle that may interact with the suspension system. These must be evaluated for any potential physical static or dynamic interference with and/or effect on the function of this BILSTEIN product.**

# E-WM05-0000136 MOUNTING INSTRUCTION



<b>Bill of Materials</b>		
<b>Item #</b>	<b>Description</b>	<b>Qty</b>
1	Reservoir Bracket	1
2	Clamp, Reservoir	1
3	Flat Head Screw, M8x1.25 L=18mm	2
4	SHCS, M6x1, SS, 50mm	1
5	Nylock Nut M6x1, Class 8	2
6	Hex Head Cap Screw, 1/4"-20, L=1.25"	1
7	Washer; 1/4" ID x 3/4" OD	4
8	Serrated Flange Nut; 5/16"-18	1
9	Threaded Insert; 1/4"-20 Internal Thread	3
10	Loop Clamp; Hose; 7/8" Dia.	1
11	Hex Head Cap Screw, 1/4"-20, L=3/4"	3
12	Anti Rotation Plate	1
13	Anti Rotation Pin	1
14	Bushing; Lower	1
15	Bushing; Upper	1
16	Alignment washer	1
17	Concave Washer	1
18	Flange Locknut; M12X1.25	1
19	Alignment Washer	1

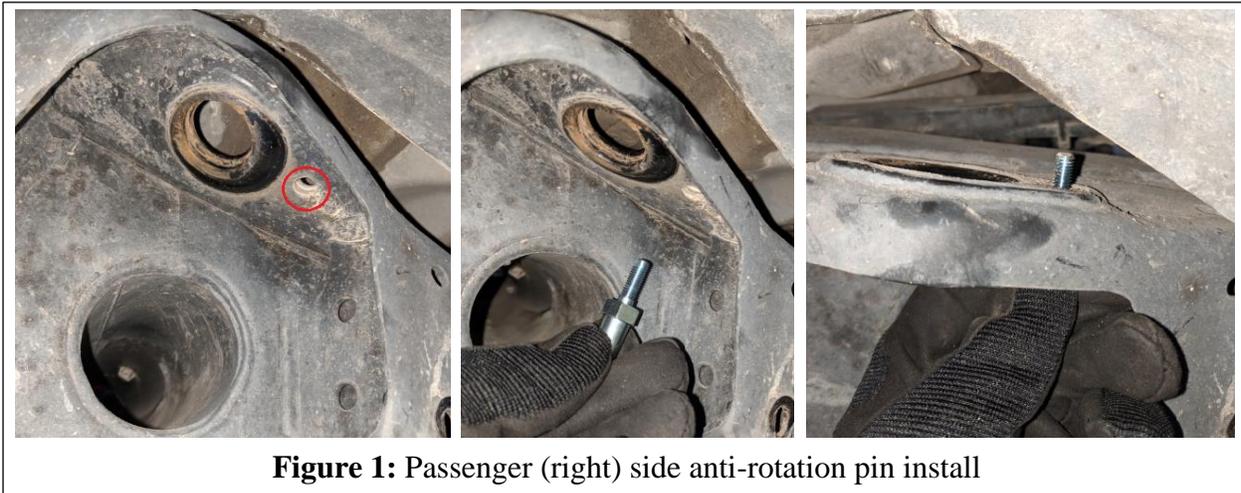
## Installation Procedure:

**Axle:** Rear

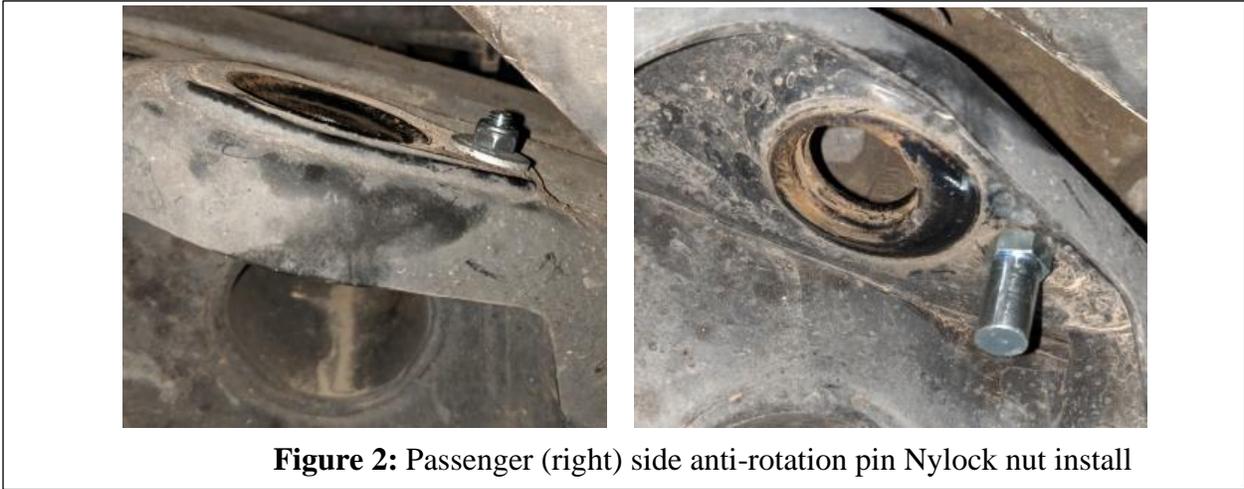
**Product:** B8 8100 Smooth Body

**A bill of materials of the included mounting part kits is shown on the previous page. See pages 18 and 19 for the end result.**

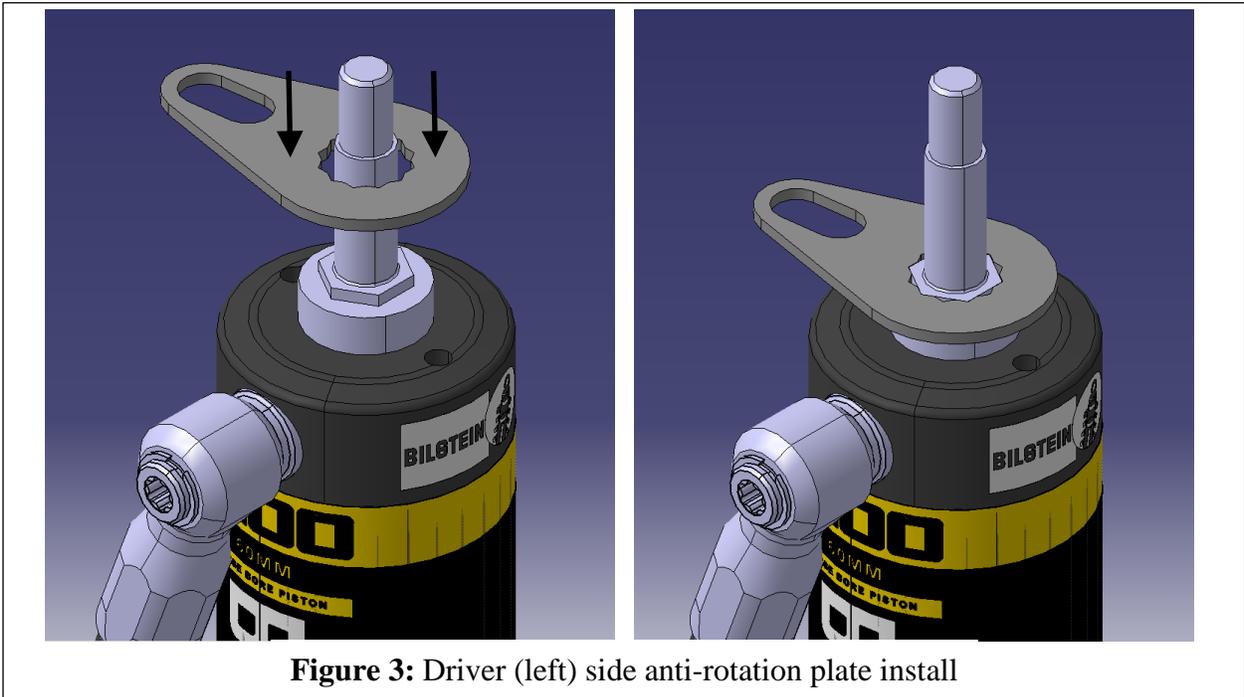
1. Remove the existing shock from the vehicle following all procedures in the vehicle manufacturer's service manual. Inspect the OE lower shock bolt/washer for any damage or excessive wear. If these components are in good condition, save them for reuse later. If damage or excessive wear is present on any of these components, purchase the required replacement OE components.
2. Place the Anti Rotation Pin (BOM item #13) into the frame hole circled in red below. This hole is towards the front of the shock mount hole. The right side is depicted. The left side is a mirror image.



3. Hold the Anti Rotation Pin with a 1/2" or 13mm deep socket. Place a Washer (BOM item #7) over the threaded stem from the top side of the frame. Thread the Nylock nut (BOM item #5) onto the stem. Then, hold the Anti Rotation Pin assembly towards the rear of the vehicle and tighten the Nylock nut with a 10mm ratcheting wrench. **Torque the Nylock nut to 7 ft-lb (10 Nm).** Right side depicted. Left side is a mirror image.



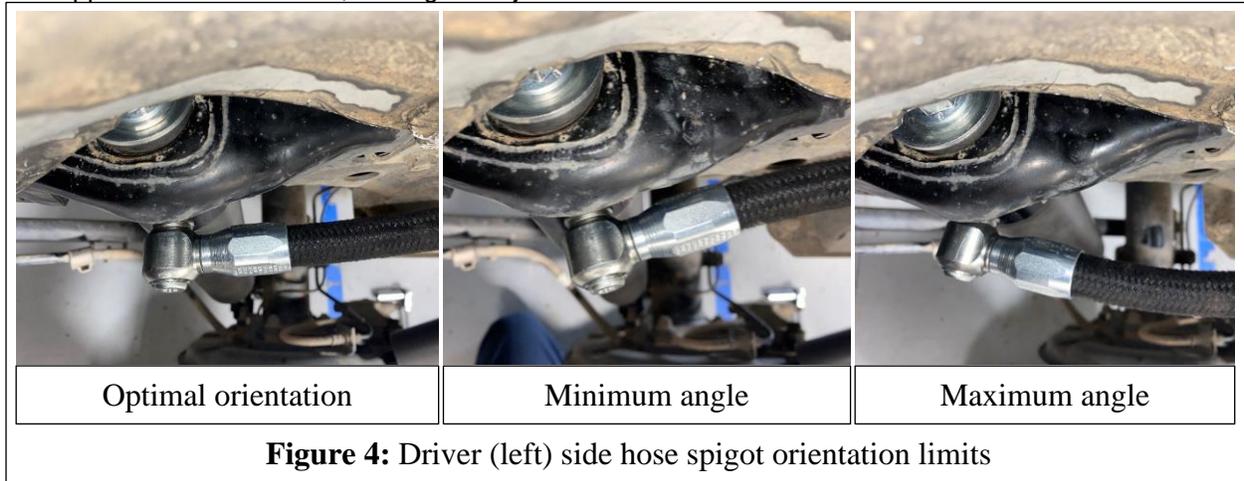
- Slide the Anti Rotation Plate (BOM item #12) over the threaded pin and onto the shock body as shown below. For the left (driver) side shock, the Anti Rotation Plate should be clocked about 90 degrees clockwise from the hose port and 90 degrees counterclockwise for the right side. Verify the double hex/twelve-point hole in the plate seats over the hexagonal boss at the base of the pin. Failure to lock this double hex/twelve-point into place as shown below may cause your shock to rotate and contact components on the vehicle.



- To ensure the hose spigot/shock body does not contact the chassis, it is essential to have proper clocking of the Anti Rotation Plate in relation to the hexagonal boss at the base of the mount pin. Shown below are three examples of an optimal, minimum and maximum hose spigot placement on the vehicle. An adjustment of the Anti Rotation Plate on the mount pin will be necessary if the Anti Rotation Plate is clocked too close to the chassis with a gap smaller than 6mm or too far away which

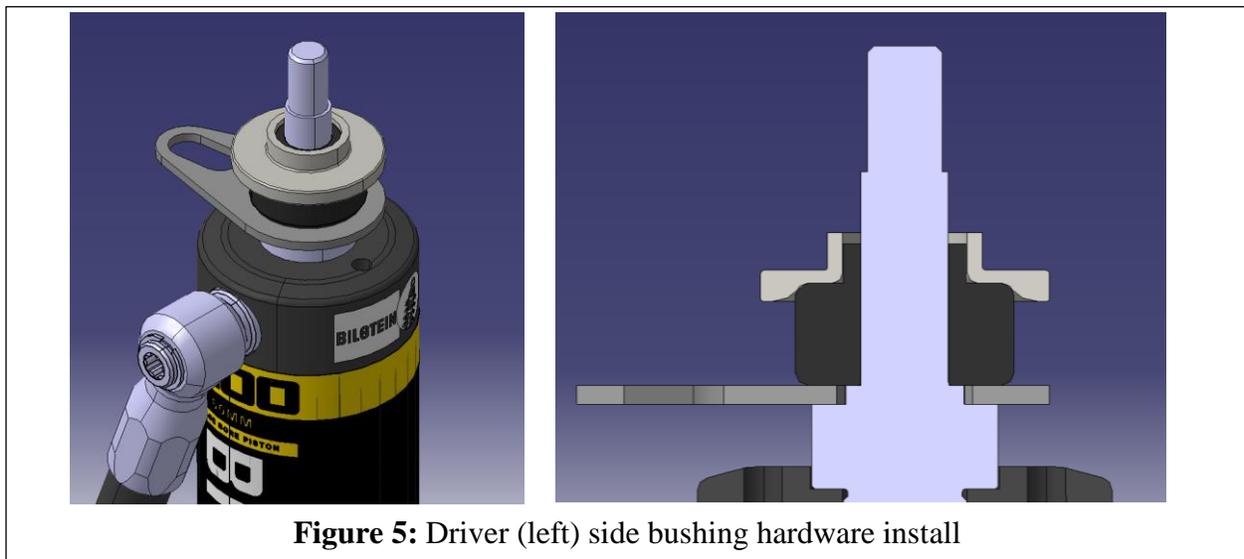


could lead to tire rubbing issues. Each notch on the double hex/twelve-point hole will give a resultant angle of 30 degrees to assist with proper alignment of the shock body. If necessary, the plate can be flipped to achieve a finer, 15-degree adjustment.



**Figure 4:** Driver (left) side hose spigot orientation limits

- Slide the Lower Bushing (BOM item #14) and the appropriate Alignment Washer for your vehicle (BOM item #16 or #19 depending on year; see BOM on page 2) over the threaded pin on the shock body as shown below. Left side depicted. Right side is a mirror image.



**Figure 5:** Driver (left) side bushing hardware install

- Install the lower shock mount and thread in the OE lower shock bolt/washer that was removed in step 1. Thread in until the lower shock mount is almost snug, but don't tighten yet.
- Using some force, compress the shock and place the threaded pin on the shock body through the chassis mount. Guide the Anti Rotation Plate (BOM item #12) so it captures the Anti Rotation Pin (BOM item #13) and carefully center the Alignment Washer (BOM item #16 or #19) in the chassis mount hole as shown below. Right side depicted. Left side is a mirror image.



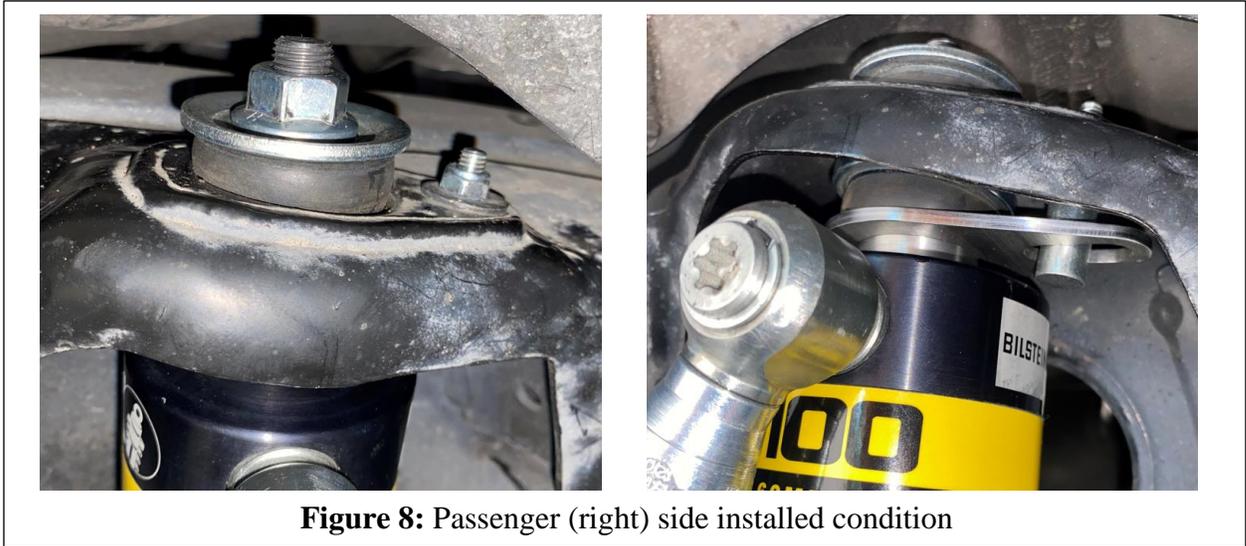
**Figure 6:** Driver (left) side upper shock pin alignment

- Slide the Upper Bushing (BOM item #15) over the threaded pin, followed by the Concave Washer (BOM item #17). Verify the Concave Washer is installed concave side up as shown below. Then thread the Flange Locknut (BOM item #18) onto the threaded pin on the shock body. Tighten the Flange Locknut using an 18mm ratcheting wrench.  
**Torque the Flange Locknut to 20 ft-lb (27 Nm).**

- Verify your current install and anti-rotation pin position looks like the following images

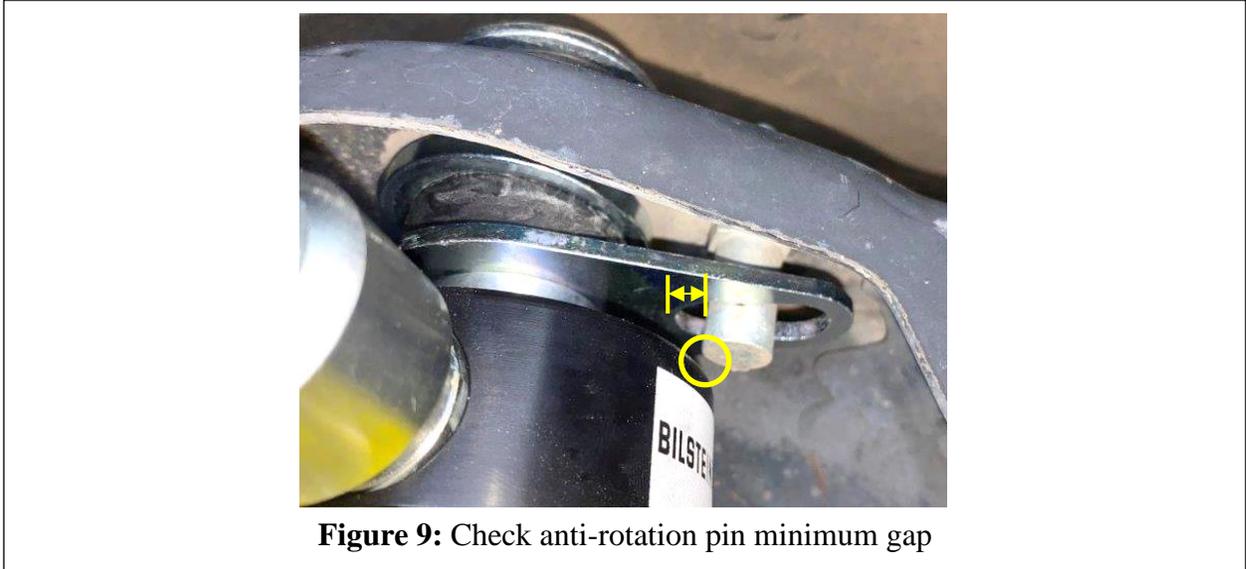


**Figure 7:** Driver (left) side installed condition



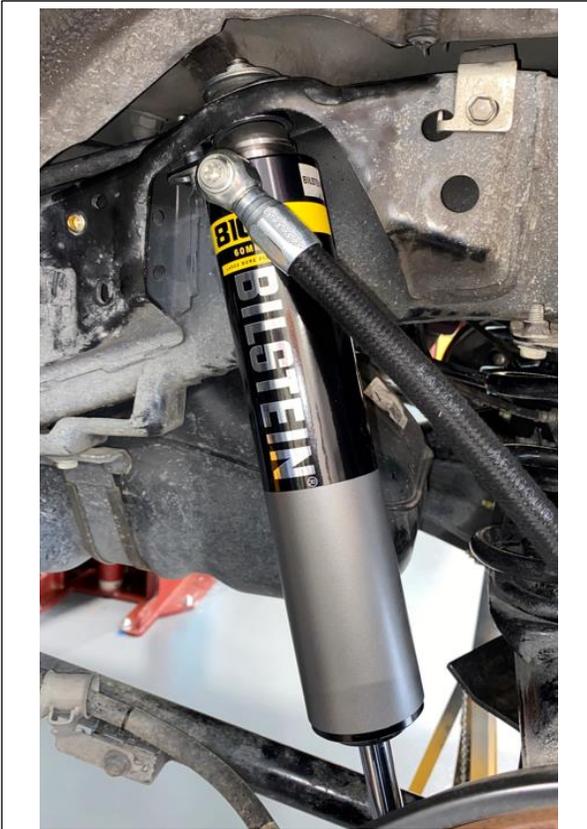
**Figure 8:** Passenger (right) side installed condition

- 11. With both upper and lower shock mounts secured, and with the rear suspension at full droop, make sure the Anti Rotation Pin is not contacting the ends of the Anti Rotation Plate slot or the shock body. If it is contacting, loosen the Nylock nut (BOM item #5) and slide the Anti Rotation Pin forward slightly until there is a small gap (~1/16"). Re-torque Nylock nut according to step 3.



**Figure 9:** Check anti-rotation pin minimum gap

- 12. You should now have both shocks installed as shown below.



**Figure 10:** Driver (left) side shock installed



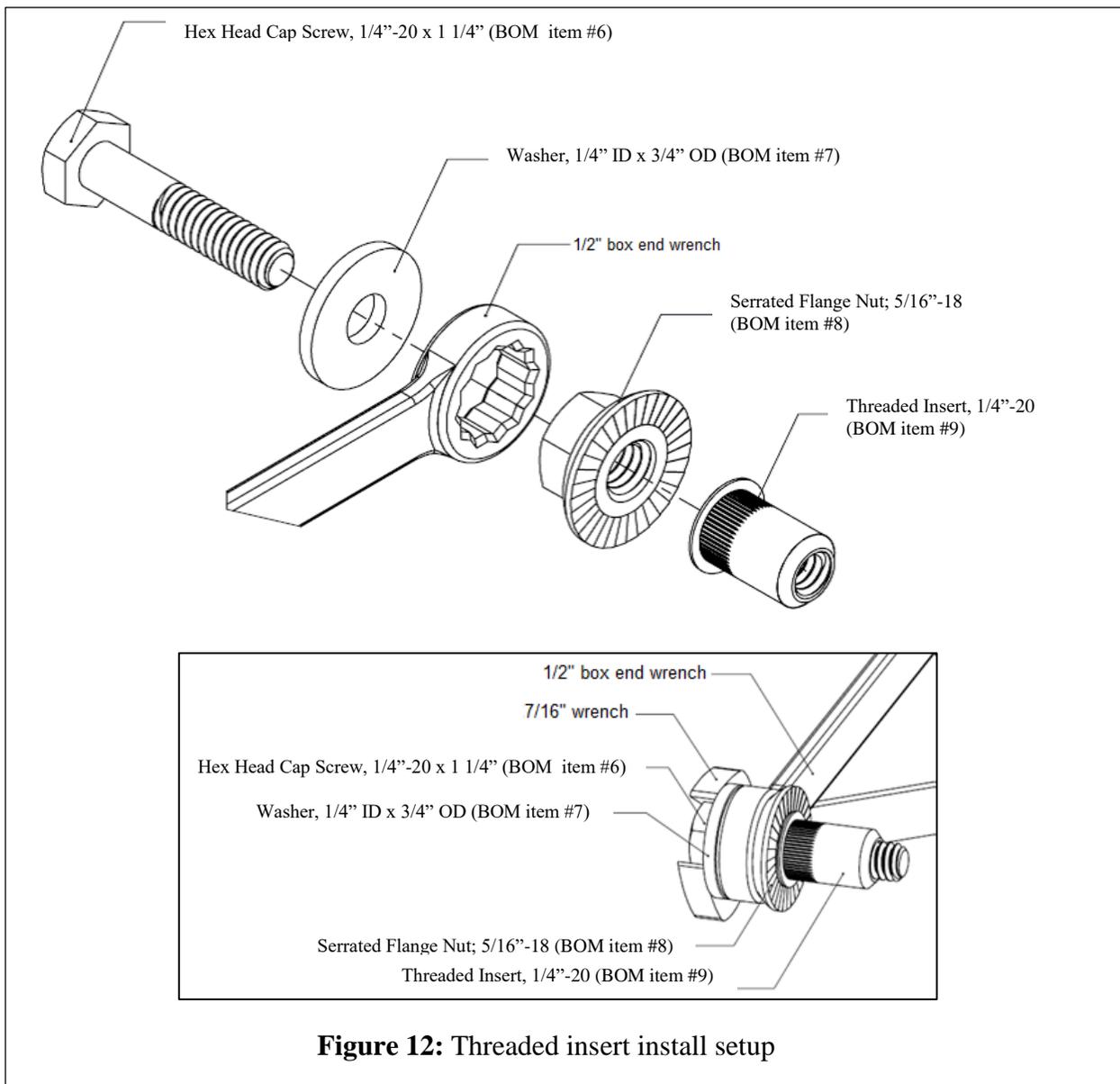
**Figure 11:** Passenger (right) side shock installed



## Threaded Inserts Installation Procedure (repeat this procedure for all Threaded Inserts)

13. If you have access to a threaded insert gun or pliers, that may be preferable to set the provided threaded inserts. Otherwise, using the BOM items shown below and a 1/2" box end wrench, arrange them as shown and turn the 1/4"-20 hex head cap screw by hand until it is snug.

Note that the screw will pass through the serrated flange nut without engaging the threads. The threads will instead engage the threaded insert. The serrations on the flange nut prevent the threaded insert from rotating while setting it.



14. Place the threaded insert (BOM item #9) into the hole.



15. While keeping the threaded insert flange firm and parallel against the frame rail, tighten the hex head cap screw (BOM item #6) using a 7/16" box end wrench or socket. Turn it 2.5 rotations to set the threaded insert. Tightening in 1/4 turn increments tends to work well.



16. Remove the screw, washer, and flange nut. The threaded insert should now be rigidly fixed in the hole as shown below.

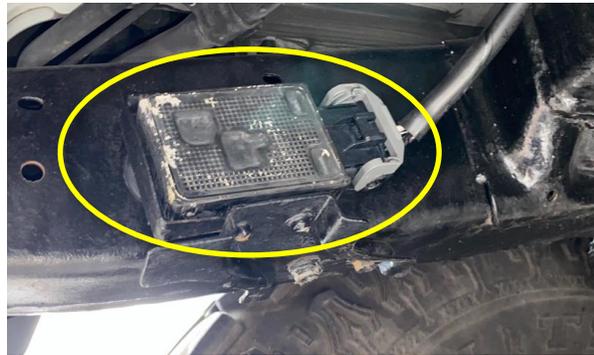


## Reservoir Installation Procedure

**Note:** The rear left fuel pump control module varies between model years. It should not affect installation but be aware as you use the pictures for reference. The 2008 Toyota FJ will not have a fuel pump control module. '09 - '14 years have one that varies by year as shown below.

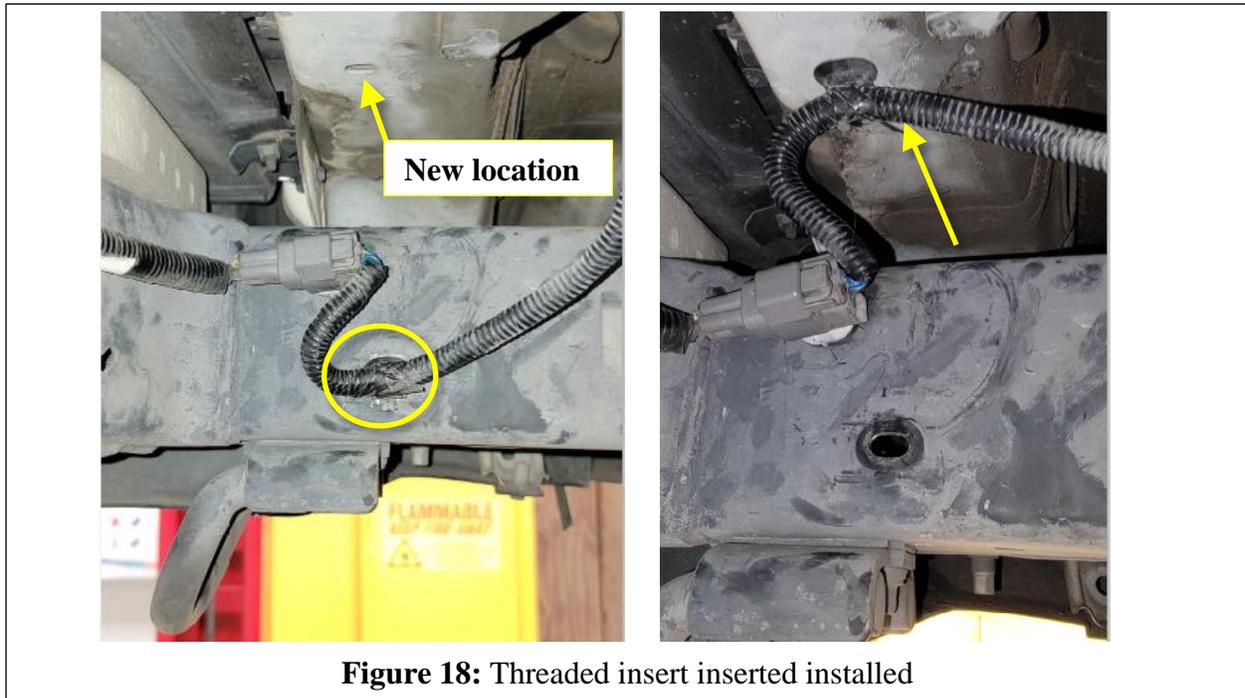


**Figure 16:** 09-13 Toyota FJ Fuel Pump Control Module



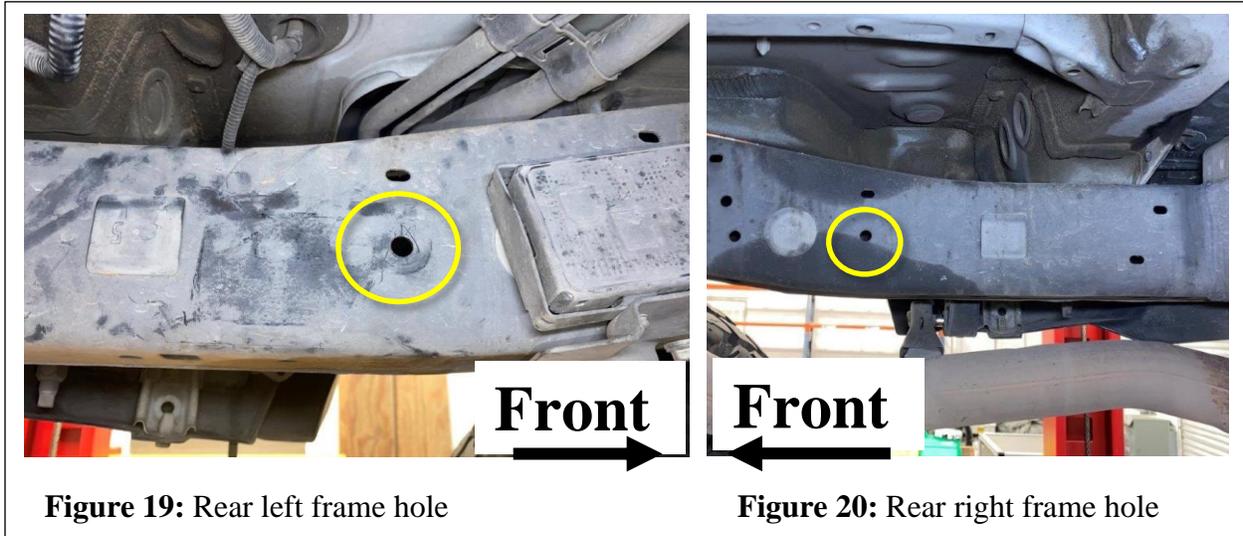
**Figure 17:** 2014 Toyota FJ Fuel Pump Control Module

17. A wire harness for towing is located on the rear left side of the vehicle near the tow hook. Relocate the wire harness mount (circled in yellow) to the new location indicated below.

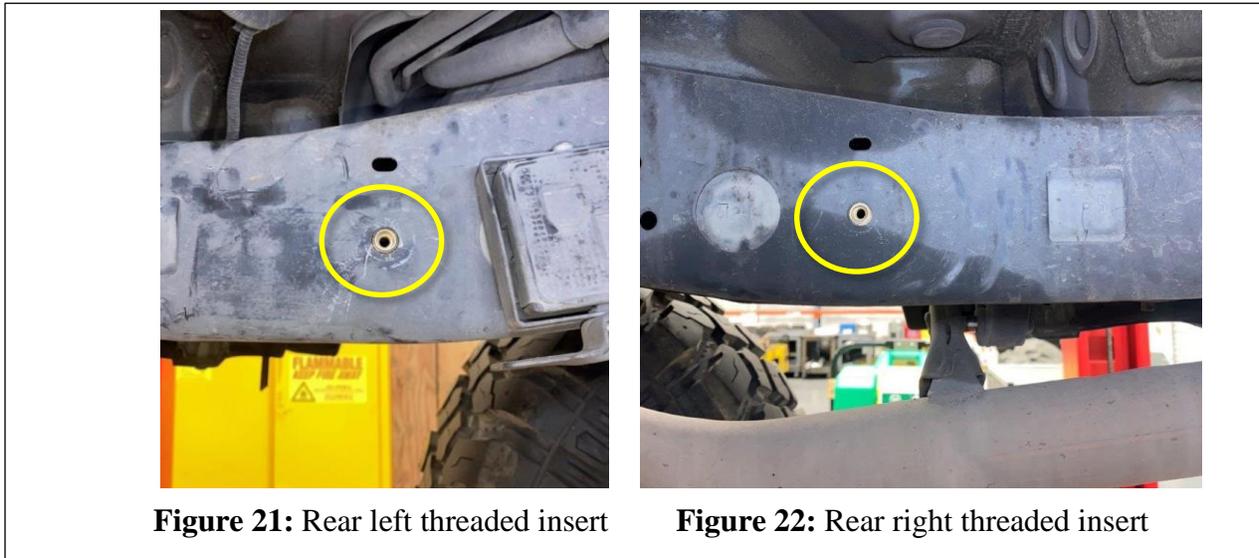


**Figure 18:** Threaded insert inserted installed

18. Continuing on the same side, locate the frame hole circled in yellow. Below is a 2014 Toyota FJ model shown.



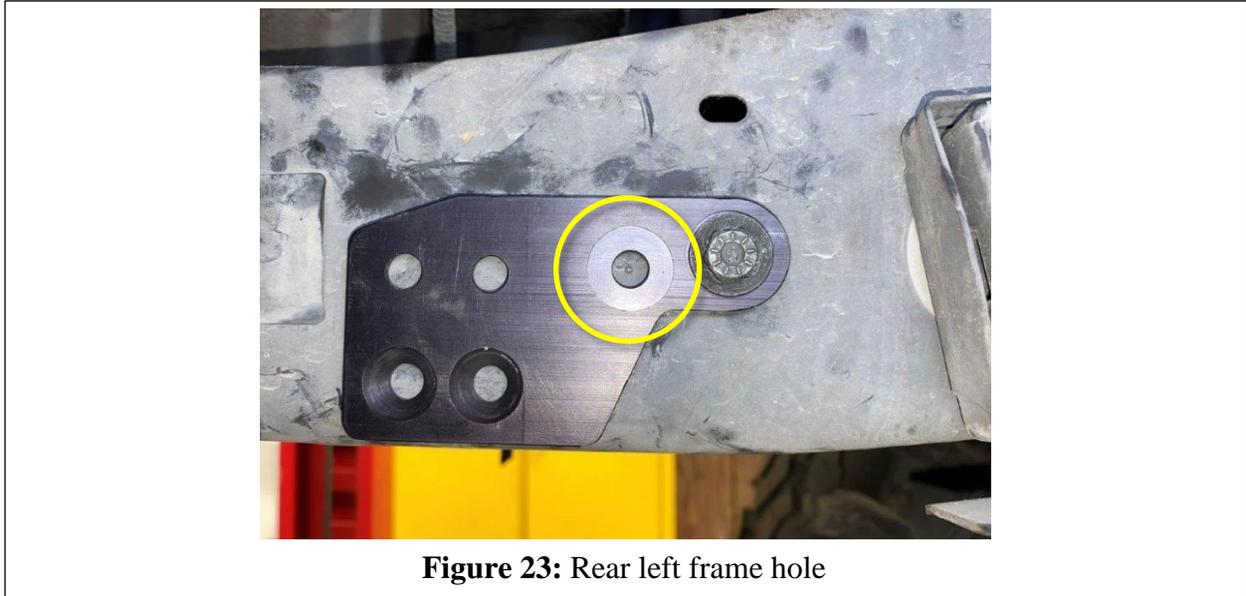
19. Install the provided 1/4-20 threaded inserts (BOM item #9) into the designated holes by following steps 13-16.



20. Mount the Reservoir Bracket (BOM item #1) to the 1/4-20 threaded inserts using a Hex Head Cap Screw (BOM item #11) and 1/4" ID Washer (BOM item #7). Do not tighten. Rotate the bracket level with the bottom of the frame and hand tighten the bolt to keep in place.

21. Mark the location of the circled hole. This location will be drilled out in a following step.

22. Repeat steps 20 and 21 for the other side of the vehicle.



**Figure 23:** Rear left frame hole

- 23. Remove the Reservoir Bracket (BOM item #1) and drill a 25/64" (10mm) hole at the marked locations.
- 24. Install the 1/4-20 threaded inserts (BOM item #9) provided into those holes. Refer to step 14-16 for threaded insert installation instructions. Install the threaded inserts on both sides of the vehicle.

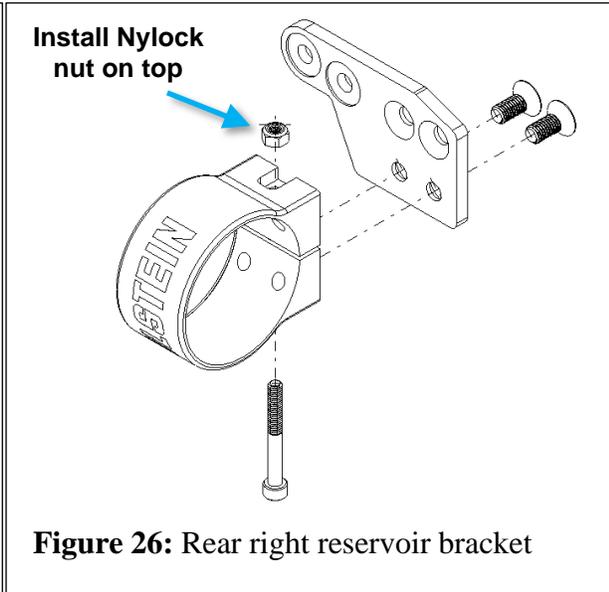
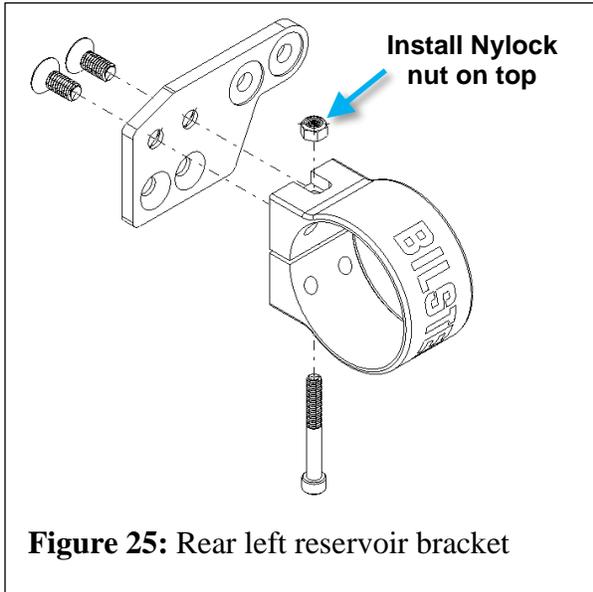


**Figure 24:** Rear left second threaded insert



**Figure 25:** Rear right second threaded insert

- 25. Prepare the assembly below by applying non-permanent thread locker to two flat head screws (BOM item #3). Mount the Reservoir Clamp (BOM item #2) to the reservoir bracket (BOM item #1) as shown below using the two flat head screws (BOM item #3). Tighten using a 5mm hex.  
**Torque both flat head screws to 16 ft-lb (22 Nm).**
- 26. Place the Nylock nut (BOM item #5) in the upper slot of the reservoir clamp (BOM item #2) as shown below. Then place the socket head cap screw (BOM item #4) through the hole in the reservoir clamp (BOM item #2), threading it into the Nylock nut (BOM item #5) by a few turns. Leave the cap screw loose enough so the reservoir can be installed later.



- 27. Mount the reservoir bracket assembly to each side of the vehicle, this time using the threaded insert at the drilled hole to mount it. Apply non-permanent thread locker to the hex head cap screw (BOM item #11).
- 28. Install a hex head cap screw (BOM item #11) and washer (BOM item #7) into the drilled mounting hole. Do not tighten at this point, the bracket should be able to rotate.



**Figure 27: Rear left bracket partial install**



**Figure 28: Rear right bracket partial install**

# E-WM05-0000136 MOUNTING INSTRUCTION



29. Slide the reservoir into the reservoir clamp, pivoting the bracket so that the second frame mounting hole is accessible as shown below. Apply non-permanent thread locker to the second hex head cap screw (BOM item #11). Install the screw along with a washer (BOM item #7) into the second frame mounting hole. Pictures of non-DSA and DSA shock variants are shown below.  
**Torque both hex head cap screws to 14 ft-lb (19 Nm).** Repeat this step for the other side of the vehicle.



**Figure 29:** (non-DSA) Rear left reservoir install



**Figure 30:** (non-DSA) Rear left reservoir bracket bolt



**Figure 31:** (DSA) Rear left reservoir install

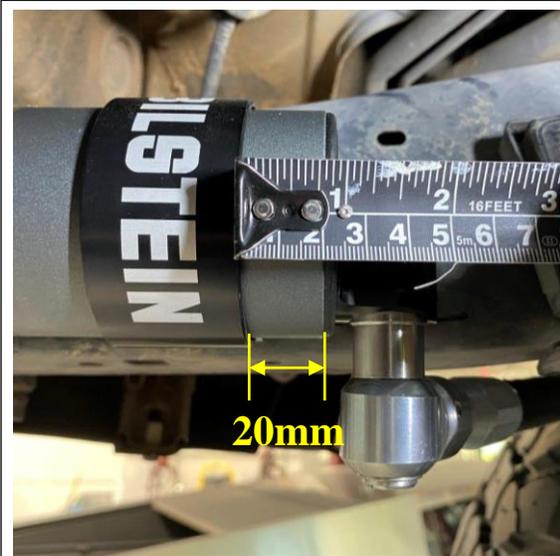


**Figure 32:** (DSA) Rear left reservoir bracket bolt

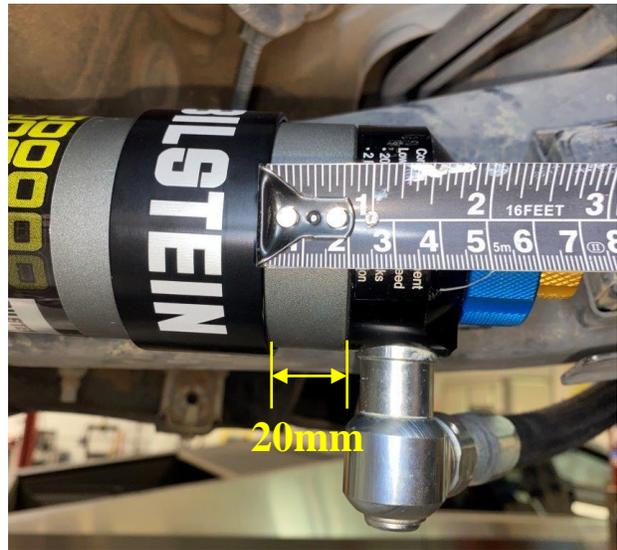
# E-WM05-0000136 MOUNTING INSTRUCTION



30. Position the reservoirs on both sides as shown and confirm it is not contacting anything on the vehicle. Tighten the socket head cap screw (BOM item #4) to secure the reservoir in place. **Torque the socket head cap screw to 6 ft-lb (8 Nm).** Repeat for the other side.



**Figure 33:** (non-DSA) Rear left reservoir positioning

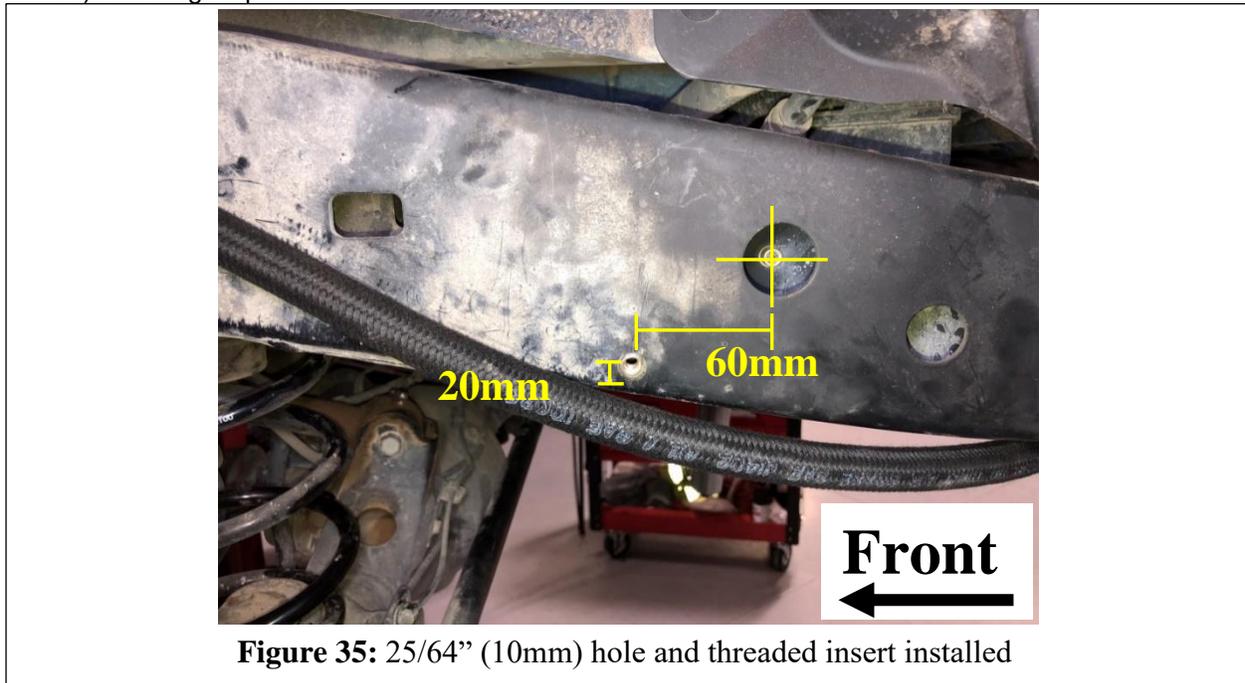


**Figure 34:** (DSA) Rear left reservoir positioning

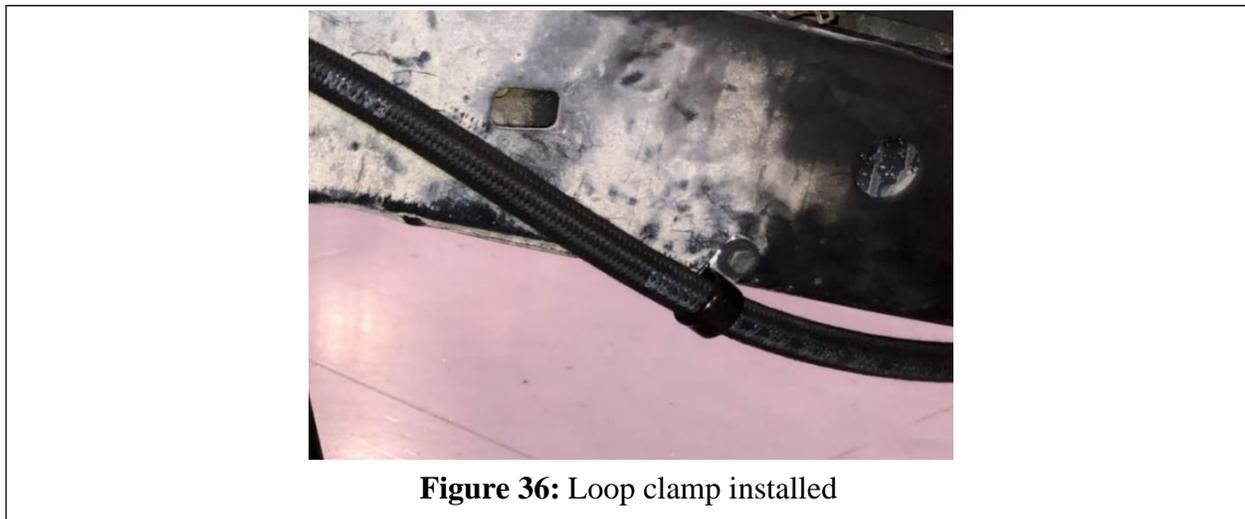
## Hose Clamp Installation Procedure

(Left side shown, right side is a mirror image)

31. From the outside of the frame drill a 25/64" (10mm) hole in the location depicted below. 60mm forward of the frame hole and 20mm from the bottom edge of the frame. Install one threaded insert (BOM item #9) following steps 14-16.



32. Place the loop clamp (BOM item #10) around the hose as shown below. Apply non-permanent thread locker to hex head cap screw (BOM item #11) and use a 7/16" wrench to mount the hose to the frame. **Torque the cap screw to 14 ft-lb (19 Nm).**



# E-WM05-0000136 MOUNTING INSTRUCTION



- 33. With the vehicle back on the ground, tighten the OE lower shock bolt/washer that was installed in step 7.  
**Torque OE lower shock bolt to factory specifications.**  
This completes the installation.

**Final rear left (driver) B8 8100 non-DSA and DSA shock installed on vehicle:**



OR



**Figure 37: Rear left shock installed**

Final rear right (passenger) B8 8100 non-DSA and DSA shock installed on vehicle:



OR



Figure 38: Rear right shock installed



**\* The following instructions apply to DSA dampers only \***

### **Dual Speed Reservoir Adjustment**

These dampers come equipped with independent high and low speed compression damping adjusters located on the reservoir. The high speed is the blue knob and is labeled as such, and the low speed is the gold knob and is labeled as such. The **FULL FIRM** setting for each adjuster knob is achieved when the knob is turned all the way **CLOCKWISE**. The **FULL SOFT** setting for each adjuster knob is achieved when the knob is turned all the way **COUNTER-CLOCKWISE**. To make high or low speed adjustments, simply turn each knob individually until the desired level of control is achieved. To stiffen the ride, turn the knobs clockwise. To soften the ride, turn the knobs counter-clockwise.

The factory setting of these adjusters are as follows:

- High Speed (blue knob) – 6 clicks counter-clockwise from fully firm.  
(10 total settings are available which translates to 9 clicks; 1 rotation)
- Low Speed (gold knob) – 13 clicks counter-clockwise from fully firm.  
(20 total settings are available which translates to 19 clicks; 2 rotations)

**Please note: It's normal for the high speed (blue) knob to become significantly more difficult to turn when progressing to the firmer end of the adjustment range; particularly during the last 3 to 4 settings/clicks. This increased difficulty is a result of the increasing preload of the high speed valve stack shims. To aid in ease of adjustment at the firmest end of the high speed range, it's optional to use Bilstein wrench part # E-XS01-0000004. This is included in most kits and if not, available separately. Additionally, it's normal for the clicks on the high speed (blue) knob to become less pronounced at the firmer end of the adjustment range.**



#### **B8 8100 service:**

For service of your B8 8100 shocks, please contact:  
THYSSENKRUPP BILSTEIN OF AMERICA  
Toll Free: 1-800-537-1085  
bilsteinus.com