

E-WM05-0000178AA

MOUNTING INSTRUCTION



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.

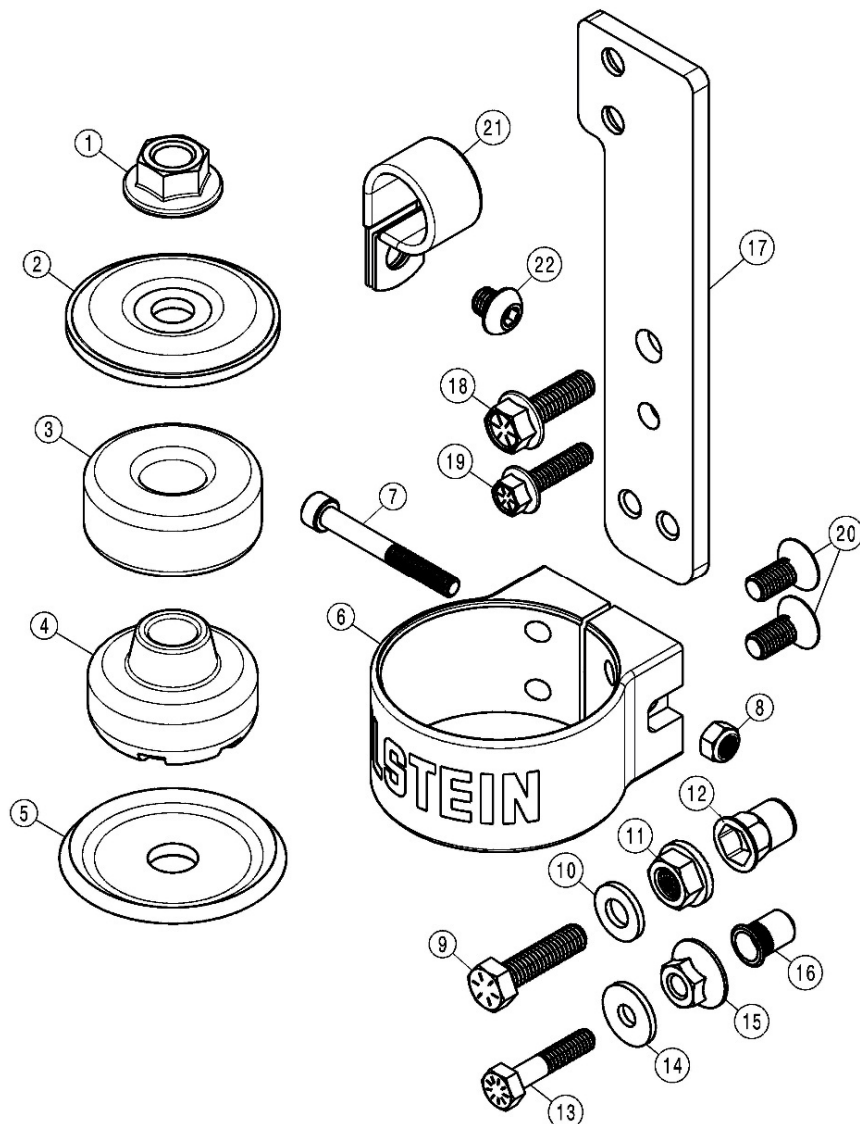
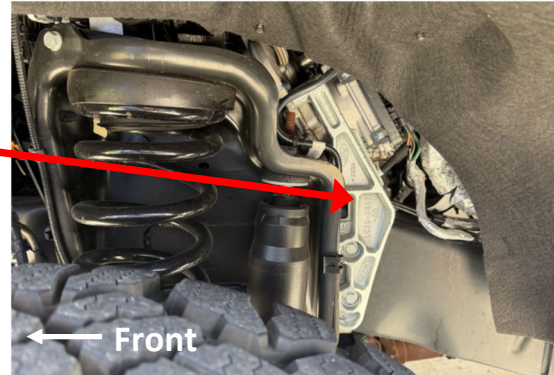
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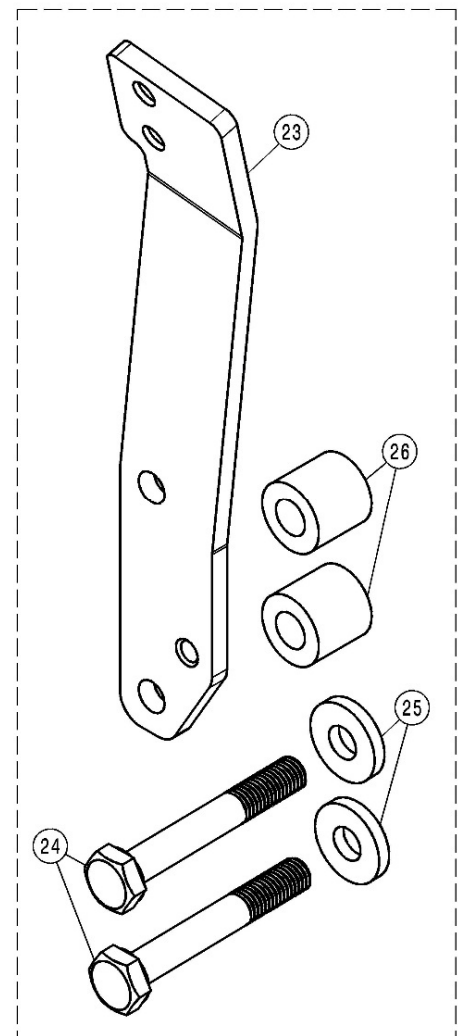


The remote reservoir mounting components depicted in the dashed box below should only be used on the left (driver) side if your vehicle is equipped with the electric steering assist module. For the right (passenger) side installation, these components will not be used and can be discarded.

electric steering assist module



electric steering assist
module specific parts:



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Bill of Materials		
Item #	Description	Qty.
1	Flange Locknut; M12x1.25	1
2	Upper Stem Washer	1
3	Upper Stem Bushing	1
4	Lower Stem Bushing	1
5	Lower Stem Washer	1
6	Reservoir Clamp	1
7	Socket Head Cap Screw; M6x1; L=50mm	2
8	Nylon Insert Locknut; M6x1	1
9	Hex Head Cap Screw, 5/16"-18, L=1.25"	1
10	Washer, 5/16" x 11/16"	1
11	Serrated Flange Nut, 3/8"-24	1
12	Threaded Insert, hex, 5/16"-18	1
13	Hex Head Cap Screw, 1/4"-20, L=1.25"	1
14	Washer, 1/4" x 3/4"	1
15	Serrated Flange Nut, 5/16"-18	1
16	Threaded Insert, 1/4"-20	1
17	Reservoir Mount Plate	1
18	Hex Flange Cap Screw, 5/16"-18, L=1"	1
19	Hex Flange Cap Screw, 1/4"-20, L=1"	1
20	Flat Head Cap Screw, M8x1.25, L=18mm	2
21	Loop Clamp, Hose	1
22	Button Head Socket Cap Screw, M8x1.25, L=8mm	1
23	Electric Steering Assist Module Reservoir Mount Plate	1
24	Hex Head Cap Screw, M10x1.5, L=70mm	2
25	Washer, M10 x 25mm	2
26	Electric Steering Assist Module Mount Plate Spacer	2

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IMPORTANT!!!

This BILSTEIN product is NOT compatible with OE wheel backspacing. Wheels with a maximum of 4.75" backspacing must be used (equates to a 8.5" width wheel with a zero offset). The largest tire size that will clear the hose and reservoir with a 4.75" backspaced wheel is a 37x12.5". Final installation must be evaluated for any potential physical static or dynamic interference between the hose, reservoir and the wheel/tire. Additional modifications may be needed to prevent the tire from rubbing on the chassis and body mount components.

In addition, due to the extended down travel of the front shocks, 2-2.5" lift springs or 2-2.5" spring spacers are required for DIESEL vehicles, and 1-2.5" lift springs or 1-2.5" spring spacers are required for GAS vehicles. For guaranteed fitment on DIESEL vehicles use Bilstein spring kit # 53-317308.

It is normal to hear a slight audible clicking noise during rebound strokes in the B8 8100 shocks, most notably during low velocity events. This is due to the internal pistons engaging each other creating the position sensitive rebound zone.

Note: The shocks and hardware depicted herein may differ slightly in appearance from the supplied components. In addition to common hand tools, the following tools will be required to complete the installation:

- Drill
- 25/64" (~10mm) and 1/2" (~13mm) drill bits
- Centerpunch and/or marker
- 1/2" and 9/16" box-end wrenches (or nutsert installation tool)
- Non-permanent high strength thread-locking compound

B8 8100 shock installation procedure:

[NOTE: Steps A-E apply to all vehicle variants]

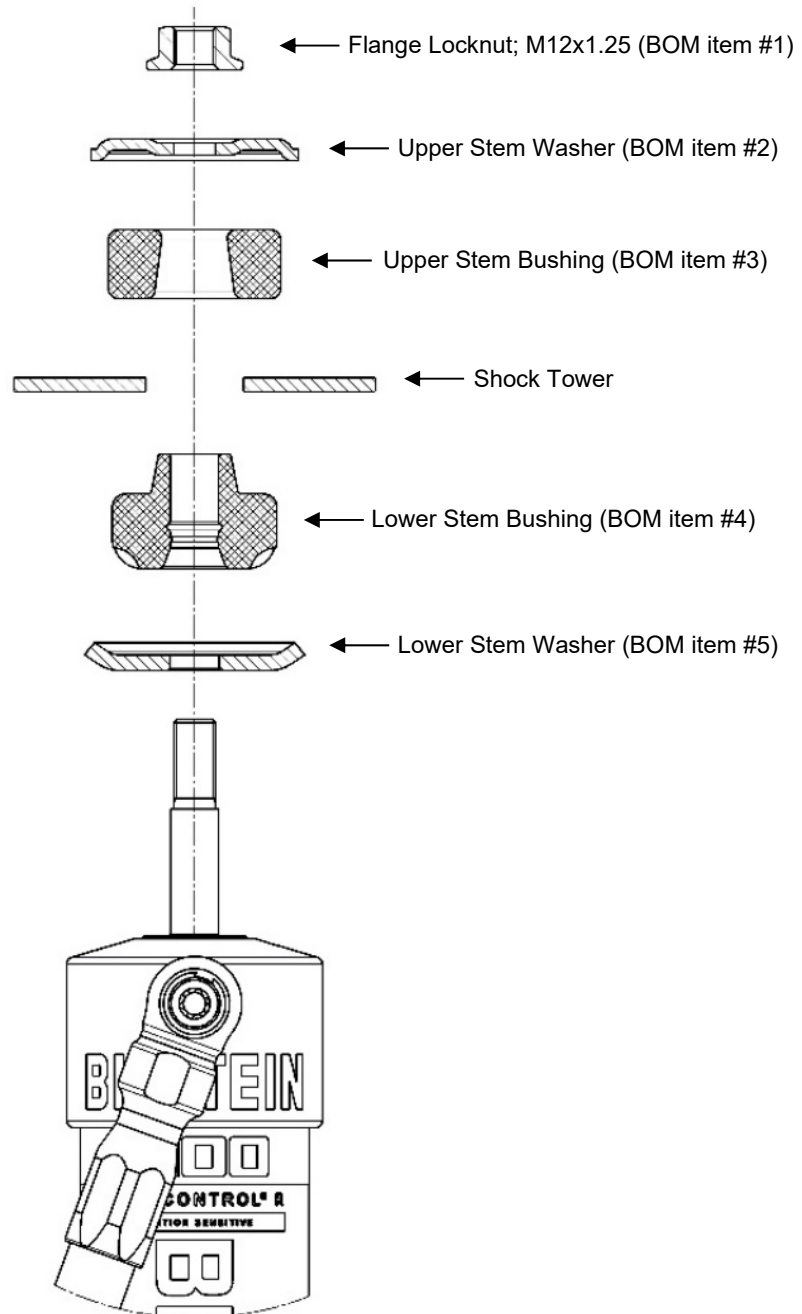
- A. Remove the fender liner from the front wheel well and save all mounting hardware to be used later for installation.
- B. Remove the existing shock from the vehicle following all procedures in the vehicle manufacturer's service manual.
- C. Slide the lower washer (BOM item #5) and the lower bushing (BOM item #4) over the threaded mount pin on the shock body as shown in Step D. Verify the lower washer is installed concave side up.

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- D. With the above complete, slide the threaded pin of the shock body through the chassis mount and carefully center the lower bushing (BOM item #4) in the mount hole. Slide the upper bushing (BOM item #3) over the threaded mount pin, verify the tapered ID of the upper bushing is oriented correctly as shown below. Then install the upper washer (BOM item #2) concave side down. Thread the M12x1.25 flange nut (BOM item #1) onto the threaded pin on the shock body. Using a wrench, thread the flange nut down the threaded pin until the slack in the bushings/washers is taken up. Do not torque the nut at this time.

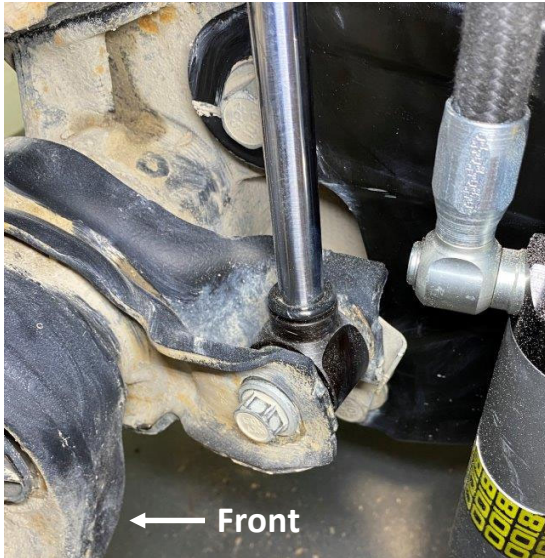


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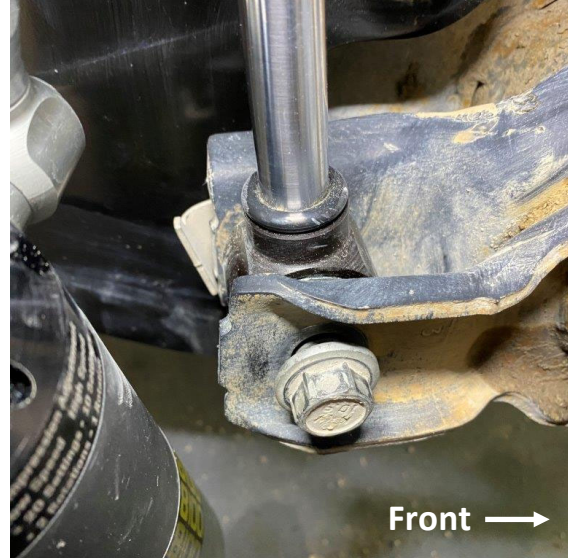
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- E. Align the lower shock mount in the front mount clevis. Install the OE shock bolt that was removed in Step B (1 per side) making sure the hex head of the bolt is facing outboard. Thread the bolt into the OE captured flange nut, while maintaining proper orientation of the OE captured nut's alignment tab, until the slack between the components is taken up (shown below). Do not torque the bolt and flange nut at this time (the lower mount hardware should still rotate freely).



Left (Driver) Lower Mount



Right (Passenger) Lower Mount

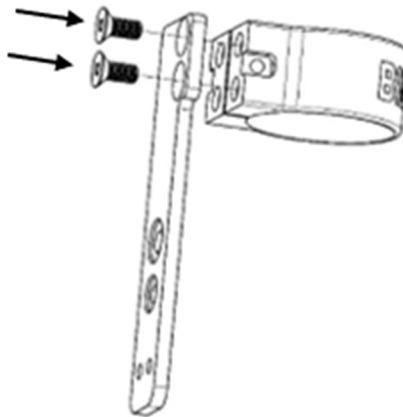
[NOTE: If your vehicle is NOT equipped with the electric steering assist module:

- Follow Steps F-Q and skip Steps R-U for both driver and passenger side.

If your vehicle IS equipped with the electric steering assist module:

- For passenger side, follow Steps F-Q and skip Steps R-U
- For driver side, skip Steps F-Q and go straight to Steps R-U]

- F. Prepare the reservoir mounts as shown below. Attach the reservoir clamp (BOM item #6) to the mount plate (BOM item #17) using the two M8x1.25 flat head cap screws (BOM item #20). Apply thread-locking compound and **torque Flat Head Cap Screws to 19 ft-lb (25 Nm)**.

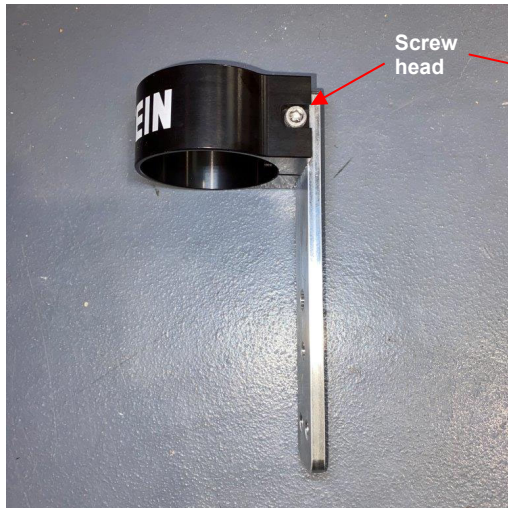


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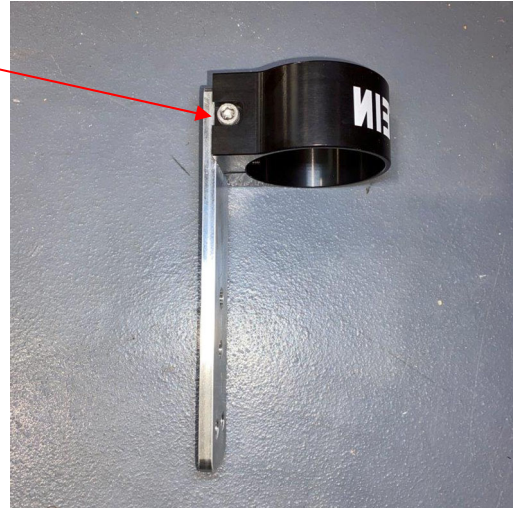
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- G.** Place the M6 nylon-insert locknut (BOM item #8) in the slot on the backside of the reservoir clamp (BOM item #6). Then, install the M6x1 socket head cap screw (BOM item #7) through the hole in the reservoir clamp and into the locknut. Ensure the locknut is located on the inside of the assembly with the screw head facing toward the rear of the vehicle once installed as you will need access to the screw head once the assembly is on the vehicle. Thread the socket head cap screw in a few turns for now but leave loose enough so the reservoir can be installed in the following steps.



Left (Driver) Mount Plate and Clamp

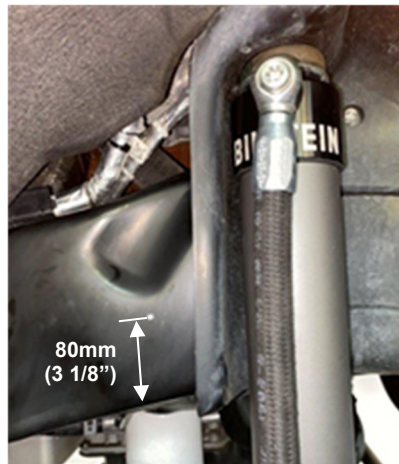


Right (Passenger) Mount Plate and Clamp

- H.** Depending on model year, the frame may already have a factory hole for the reservoir mount. If the frame has these holes (pictured below left), skip this step and proceed to Step I. Otherwise, if the frame *does not*, mark the position for the top hole (pictured below middle). Align the hole left/right using the mount plate as a guide. Drill using a 1/2" (13mm) drill bit.



**Right (Passenger) Side
w/ Holes**



**Right (Passenger) Side
w/o Holes – Height Marked**



**Right (Passenger) Side
w/o Holes – Left/Right**

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- I. Using the mount plate as a guide mark the second lower mount plate hole. Drill using a 25/64" (10mm) drill bit.



Right (Passenger) Side

- J. If you have access to a nutsert gun or pliers, that may be preferable to set the provided nutserts. Otherwise, using the items shown in Figure 1 and a 7/16" wrench, arrange them as shown and turn the 1/4"-20 screw by hand until it is snug (Figure 2). Note that the screw will pass through the serrated flange nut without engaging the threads. The serrations on the flange nut prevent the nutsert from rotating while setting it.

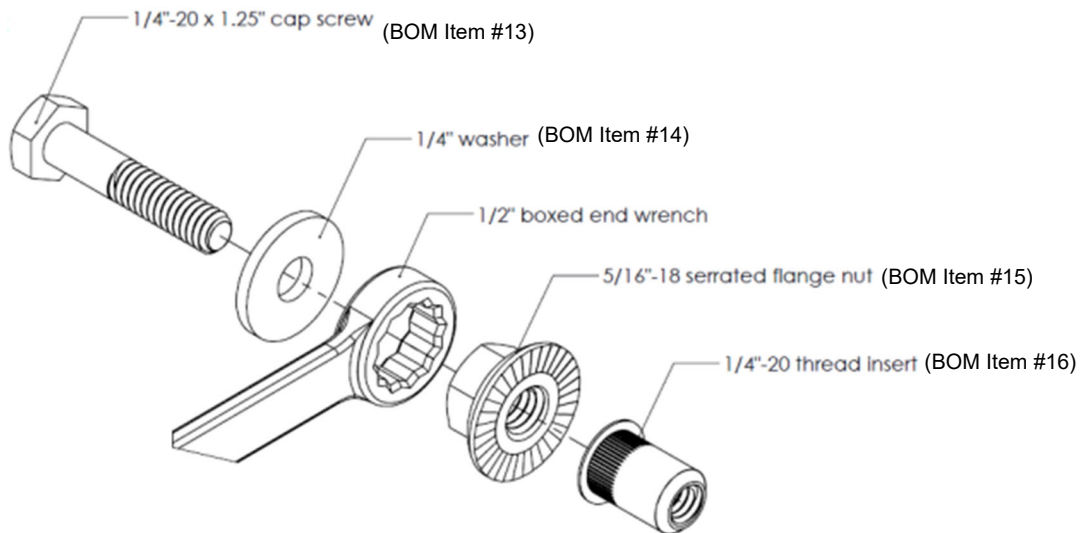


Figure 1

E-WM05-0000178AA MOUNTING INSTRUCTION

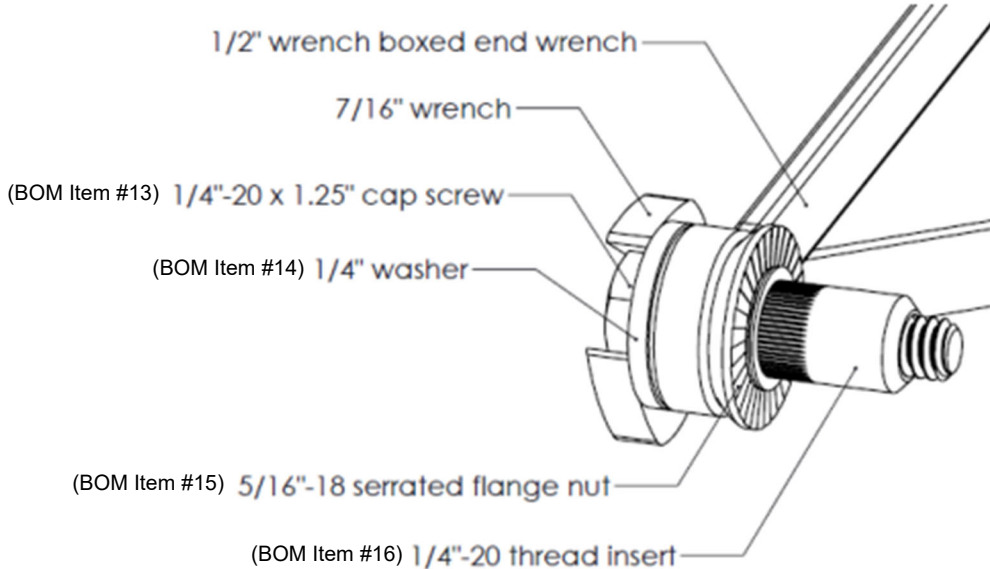


Figure 2

- K.** Insert the 1/4"-20 threaded insert into the bottom hole as shown in figures 2 and 3. While keeping the threaded insert flange firm and parallel against the frame, tighten the screw using the 7/16" wrench or socket. Hold the 1/2" box-end wrench stationary and turn the 7/16" wrench two full rotations to set the threaded insert. Tightening in 1/4-turn increments tends to work well.

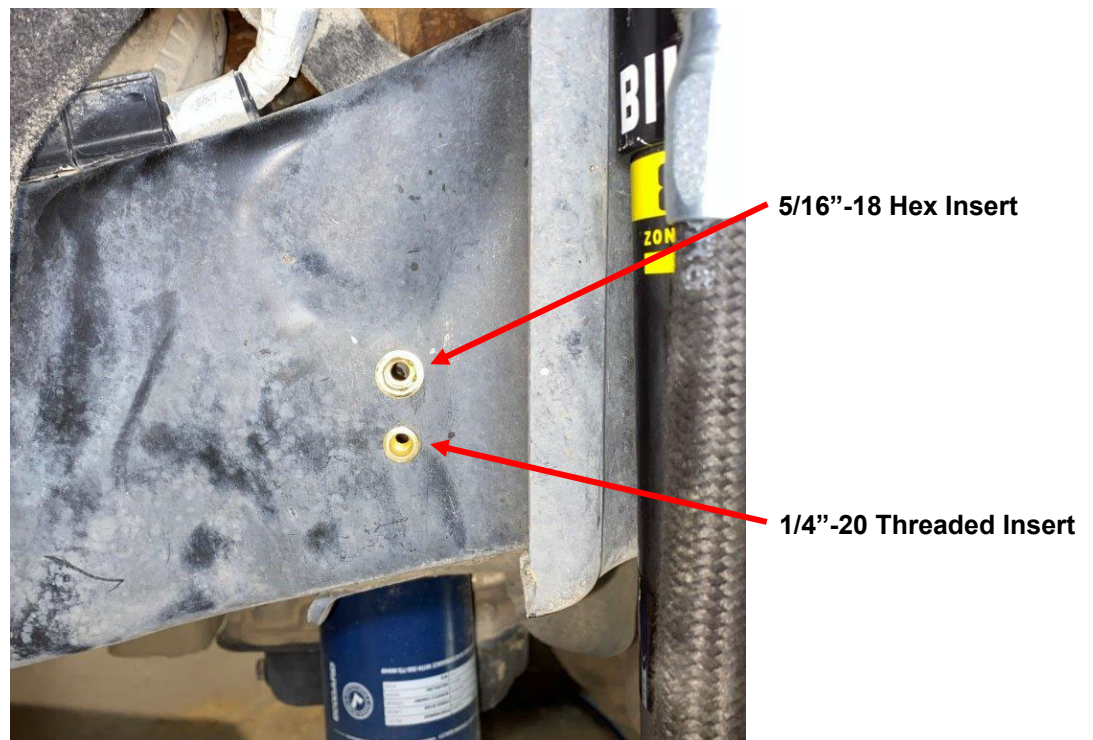


Figure 3: Right (Passenger) Side Depicted

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- L.** Remove and discard the screw (BOM item #13), washer (BOM item #14), and serrated flange nut (BOM item #15). The threaded insert (BOM item #16) should now be rigidly fixed in the hole.
- M.** Assemble the 5/16"-18 hex screw (BOM item #9), 5/16" flat washer (BOM item #10), a 9/16" box-end wrench, 3/8" serrated flange nut (BOM item #11) and hex threaded insert the same way shown in figures 1 and 2.
- N.** Insert the 5/16"-18 hex threaded insert into the top hole as shown in figures 2 and 3. While keeping the hex threaded insert (BOM item #12) flange firm and parallel against the frame, tighten the screw (BOM item #9) using a 1/2" box-end wrench or socket. Turn it two rotations to set the hex threaded insert. Tightening in 1/4-turn increments tends to work well.
- O.** Remove and discard the screw (BOM item #9), washer (BOM item #10), and serrated flange nut (BOM item #11). The hex threaded insert (BOM item #12) should now be rigidly fixed in the hole.
- P.** Install the assembled reservoir mount from Step G onto the passenger-side frame using the 1" 5/16-18 hex flange cap screw (BOM item #18) and the 1/4-20 hex flange cap screw (BOM item #19). Repeat steps H-P on the driver's side if applicable (vehicles not equipped with the electric steering assist module).



Left (Driver) Side Depicted – Holed Frame Vehicle and Installed Mount Plate

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- Q. Slide the reservoir up into the clamp so there is 30mm between the end of the tube and the bottom of the clamp as pictured below. If the reservoir does not slide easily in the clamp, loosen the M6x1 Socket Head Cap Screw (BOM item #7) slightly to allow the clamp to open a little.



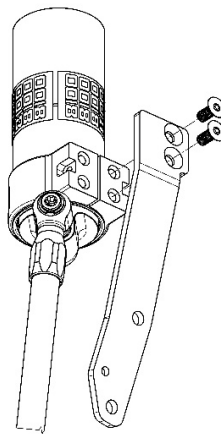
Left (Driver) Reservoir Placement



Left (Driver) DSA Reservoir Placement

[NOTE: Steps R-U only apply to the driver side of vehicles equipped with the electric steering assist module. Skip steps R-U if your vehicle is NOT equipped with this component]

- R. Slide the reservoir clamp (BOM item #6) onto the reservoir. Then, attach the reservoir clamp and reservoir to the bent mount plate (BOM item #23) using the two M8x1.25 flat head cap screws (BOM item #20). Apply a thread-locking compound and **torque Flat Head Cap Screws to 19 ft-lb (25 Nm)**.



electric steering assist module bent plate – Left (Driver) Side

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- S. Remove the two OE bolts holding the electric steering assist module to the frame as shown below.

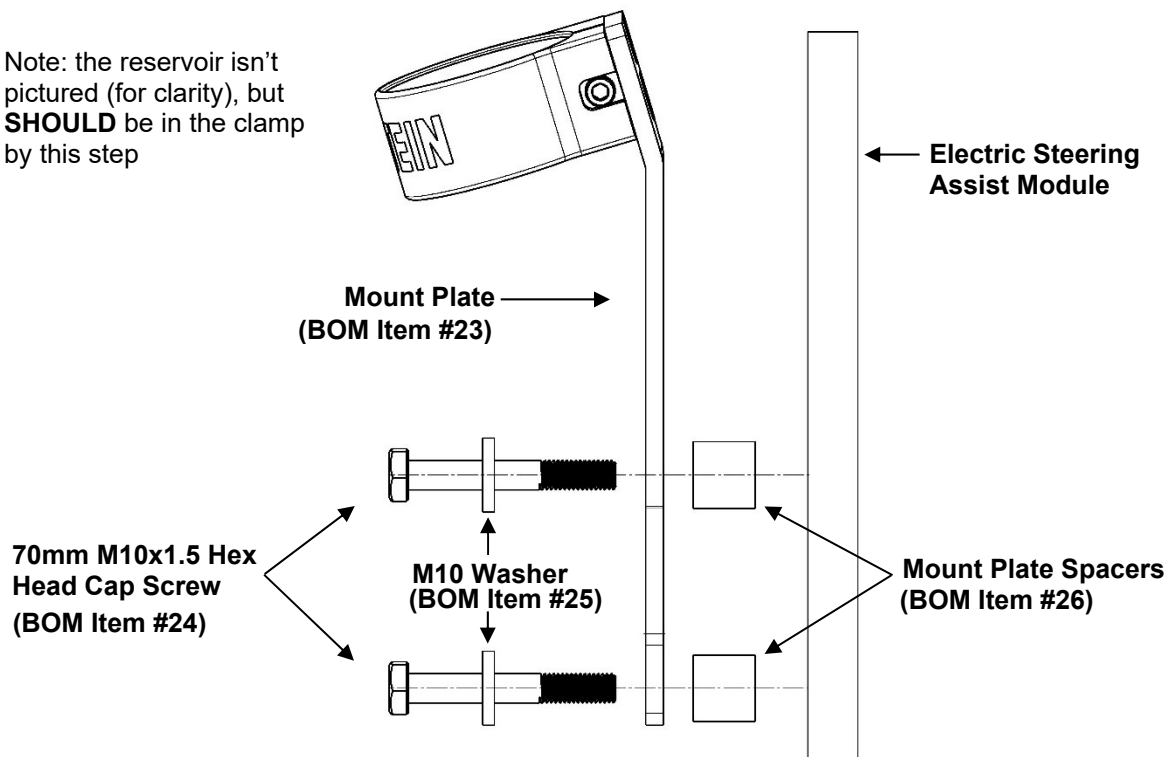


Remove OE Bolts

Electric Steering Assist Module – Left (Driver) Side

- T. Install the bent mount plate (BOM item #23) into the existing steering module holes with the hardware shown below. **Apply thread-locking compound and torque the hex head cap screws according to the vehicle manufacturer's service manual specification.**

Note: the reservoir isn't pictured (for clarity), but **SHOULD** be in the clamp by this step

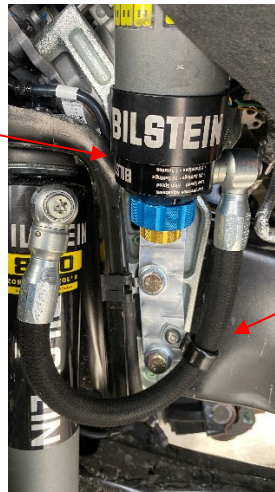


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- U. Slide the reservoir into the clamp and adjust its position such that there is little to no gap between the cap and bottom of clamp. Orient the reservoir banjo fitting rearward and angled slightly inboard so the hose nearly contacts the steering module as shown below. Install the hose clip (BOM item #21) using the 8mm M8x1.25 button head socket cap screw (BOM item #22) threaded directly to the mount plate. Apply thread-locking compound and tighten the clamp using a 5mm Allen wrench. **Torque to 6 ft-lb (8 Nm).**

Clamp flush with
end of tube



Install hose clip as
shown

Electric Steering Assist Module - Reservoir Install

[NOTE: Steps V - AA apply to all vehicle variants]

- V. Replace the fender liner in the front wheel well removed in Step A. With some vehicles, it may be necessary to trim the wheel well plastic shroud at this point. If this is the case, it's recommended to trace the area around the reservoir and cut along that line using a cutting tool as shown below.



Right (Passenger) Side Depicted

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- W.** Rotate the reservoir in the clamp so the hose spigot is nearly touching the frame as shown in Step Q. Install the hose clip (BOM item #21) using the 8mm M8x1.25 button head socket cap screw (BOM item #22) threaded directly to the mount plate using thread-locking compound. Tighten the clamp using a 5mm Allen wrench and **torque to 6 ft-lb (8 Nm)**.



Left (Driver) Hose Clamp Install (DSA Pictured)

Final Shock Mounting (applies to all vehicle variants):

- X.** After mounting the reservoir, ensure the main shock body is still oriented properly as shown in the final install pictures on the next two pages. The hose port should be clocked slightly rearward towards the reservoir (from directly outboard). There should be sufficient slack in the hose.
- Y.** Once the shock body orientation is verified, lower the vehicle so its full weight is on the suspension. Then, tighten the Flange Locknut (BOM item #1) that was installed onto the threaded pin on the shock body in Step D. Use a 6mm Allen key to keep the threaded pin from rotating while torquing the locknut. **Torque the Flange Locknut to 34 ft-lb (45 Nm).**

****** DO NOT USE AN IMPACT WRENCH TO TIGHTEN THE LOCKNUT! ******

- Z.** Fully tighten the lower shock bolt to the torque specified in the manufacturer's service manual.
- AA.** Cycle the suspension and steering through their full range of motion and check for any dynamic interference between the shock bodies, reservoir hoses, reservoirs, and surrounding components. Make any necessary adjustments to the shock alignment and/or reservoir position. The mounting locations depicted are appropriate for this application; however, some aftermarket components such as tires and/or lift kit combinations may create interference problems. It is the responsibility of the installer to determine if there is a potential for interference.

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Final left (driver) front 25-344790 B8 8100 DSA shock installed on vehicle

Without Electric Steering Assist Module:



With Electric Steering Assist Module:



Note: Non-DSA 8100s are installed in the same fashion, but lack the reservoir adjustment knobs pictured above.

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Final right (passenger) front 25-344790 B8 8100 DSA shock installed on vehicle:



Note: Non-DSA 8100s are installed in the same fashion, but lack the reservoir adjustment knobs displayed above

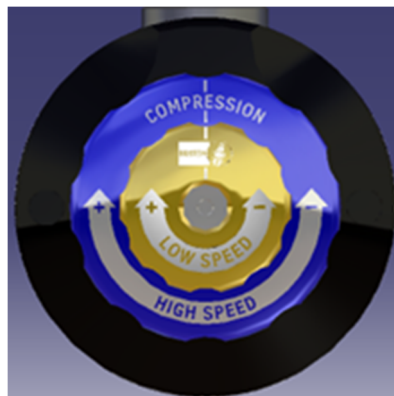
Dual Speed Reservoir Adjustment

DSA 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 **COUNTERCLOCKWISE**. 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 counterclockwise.

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.



Dual Speed Reservoir Adjuster

B8 8100 service:

For service of your B8 8100 shocks, please contact:

THYSSENKRUPP BILSTEIN OF AMERICA

Toll Free: 1-800-537-1085

bilsteinus.com