

# E4-WM5-Y649A00

## MOUNTING INSTRUCTION



**This instruction is for both left front (driver) 41-298381 and right front (passenger) 41-298374 B8 8112 shocks. A bill of materials of the included mounting part kits is shown on the next two pages.**

### **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.

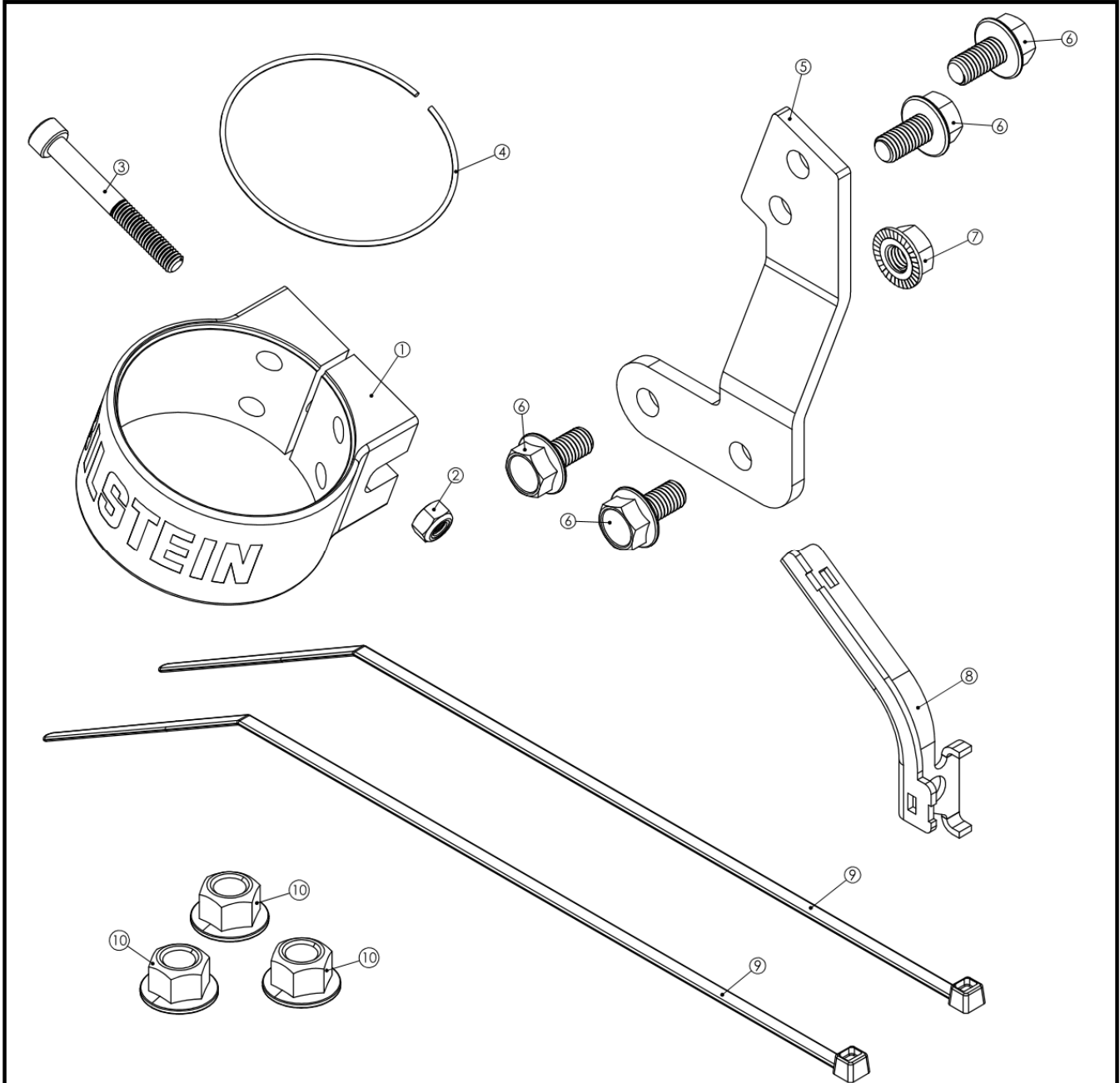
### **CAUTION for COILOVER TYPE SUSPENSIONS!!!**

**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!!!**

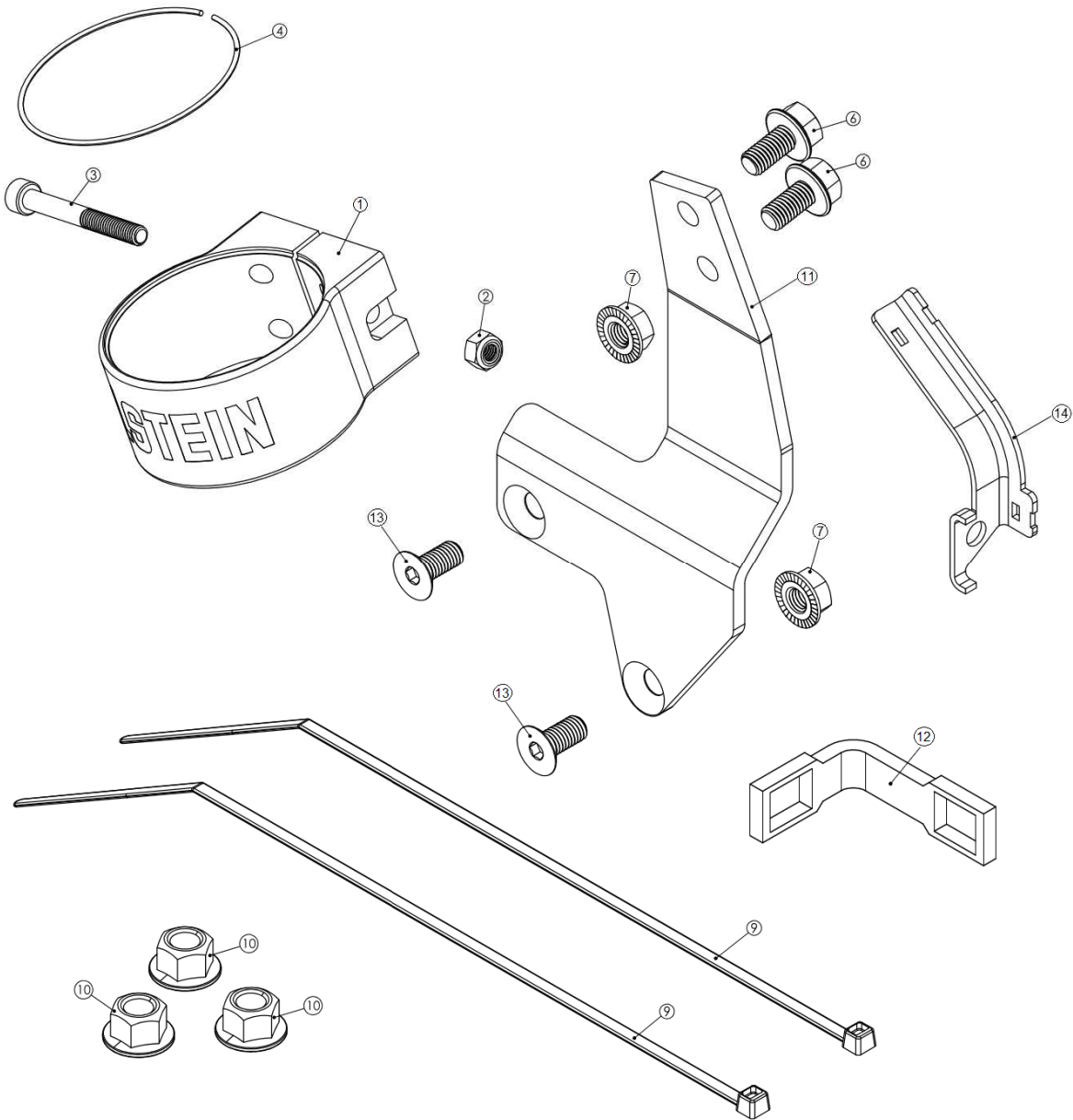
**This BILSTEIN product may or may not be compatible with non-BILSTEIN aftermarket products and/or vehicle modifications. It is the responsibility of the professional automotive suspension technician performing the installation to identify any non-OEM components and/or modifications on the vehicle that 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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<b>Bill of Materials- LEFT FRONT</b>		
<b>Item #</b>	<b>Description</b>	<b>Qty</b>
1	Reservoir Clamp	1
2	Nylock; M6x1	1
3	Socket Head Cap Screw; M6x1; L=50mm	1
4	Circlip	1
5	Reservoir Mount Plate; Left	1
6	Flange Head Cap Screw; M8x1.25; L=16mm	4
7	Serrated Flange Nut; M8x1.25	1
8	ABS Line Relocation Bracket; Left	1
9	Zip Tie	2
10	Flange Locknut; M10x1.5	3

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<b>Bill of Materials- RIGHT FRONT</b>		
<b>Item #</b>	<b>Description</b>	<b>Qty</b>
1	Reservoir Clamp	1
2	Nylock; M6x1	1
3	Socket Head Cap Screw; M6x1; L=50mm	1
4	Circlip	1
11	Reservoir Mount Plate; Right	1
6	Flange Head Cap Screw; M8x1.25; L=16mm	2
12	Installation Tool	1
7	Serrated Flange Nut; M8x1.25	2
13	Flat Head Screw; M8x1.25; L=18	2
14	ABS Line Relocation Bracket; Right	1
9	Zip Tie	2
10	Flange Locknut; M10x1.5	3

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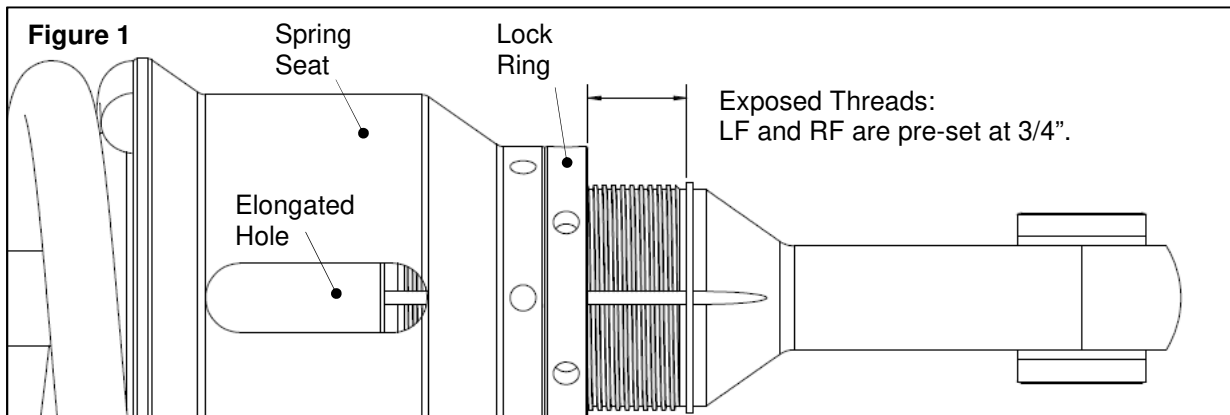


B8 8112 shocks feature a proprietary BILSTEIN zinc plated finish. This finish must be serviced in order to maintain its luster. Particularly in moist climates, a protective coating, such as a wax or lubricating oil should be periodically applied to prevent tarnishing. This finish is not covered under warranty.

It is normal to hear a slight audible clicking noise during compression and rebound strokes in the B8 8112 shocks, most notably during low velocity events. This is due to the internal pistons engaging each other creating the position sensitive compression and rebound zones.

### **B8 8112 Shock Installation Procedure:**

- A. Remove the existing shock module from the vehicle following all procedures in the vehicle manufacturer's service manual. Save the lower shock bolt and nut as they will be used later.
- B. Before installing the B8 8112 shock modules on the vehicle check if they are set at the desired lift height. The pre-set lift height is 2.5" for 4Runner KDSS models and 2.3" for GX460 models.
- C. If the above-mentioned pre-set lift height is not what is desired proceed to Step D. Otherwise, skip to Step K.
- D. Break the spring seat lock ring loose with the supplied spanner wrenches. Refer to Figure 1 below.
- E. Note the clocking of the lower mount relative to the studs on the upper mount (important for reassembly).
- F. Using an appropriate spring compressor, compress the spring until it can be rotated freely by hand. Then, spin the spring seat up or down depending on what the desired lift height is. Both sides should be adjusted to the same position (there is no need to correct for any inherent vehicle lean). See the lift height table below for a few points of reference between the amount of exposed thread and estimated lift height. **If the exposed thread dimension exceeds 1", chassis jounce bumper spacers are required (see steps MM-NN on page 18).**



Exposed Threads	Heavy Load B8 8112 Typical Lift Heights**	
	2010+ 4Runner KDSS	2010+ GX460
Left & Right Front		
1 9/32" (very top)	3.5" Lift	3.2" Lift
15/16"	2.9" Lift	2.7" Lift
5/8"	2.3" Lift	2.1" Lift
5/16"	1.8" Lift	1.6" Lift
0" (very bottom)	1.2" Lift	1" Lift

Lift heights shown include additional weight from aftermarket accessories listed below, and are measured with respect to a completely stock vehicle that has no extra weight added.

- aftermarket heavy duty steel front bumper and winch.
- aftermarket steel rear bumper.
- 400lbs of load centered over the rear axle.

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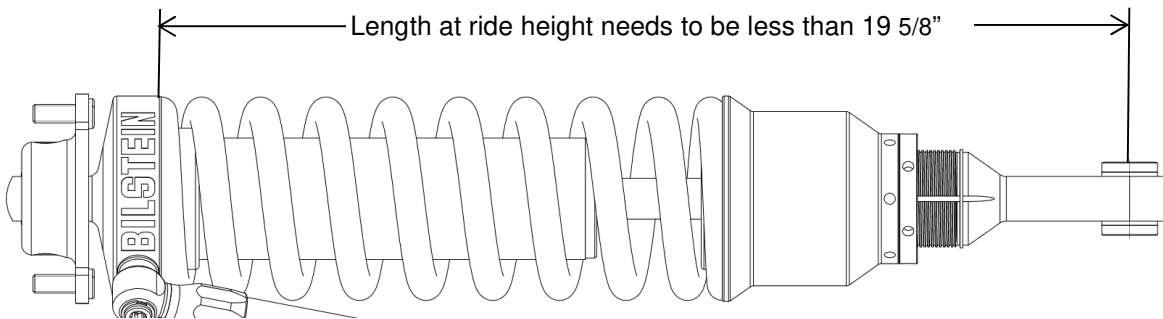
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\*\* Lift heights indicated are typical. Actual lift height is influenced by which factory suspension the vehicle is equipped with and its condition; optional equipment and accessories on your vehicle, and other vehicle modifications such as replacement coil springs, wheel and tire combinations, etc.

Modifying/lifting the suspension to your vehicle may raise its center of gravity and may make it more susceptible to loss of control and/or rollover, which may result in death or serious injury. We strongly recommend that you offset the loss of rollover resistance as much as possible by increasing tire track width, and that you equip the vehicle with a functional roll bar and cage system. Wear seat belts and shoulder harnesses at all times, and avoid situations where a side rollover may occur.

NOTE: make sure to measure the shock at ride height as shown below after the install. This is needed to insure there is at least 2" of droop travel from static ride height and so the stiffer rebound zone is not being engaged at ride height.



Left Front (driver) depicted

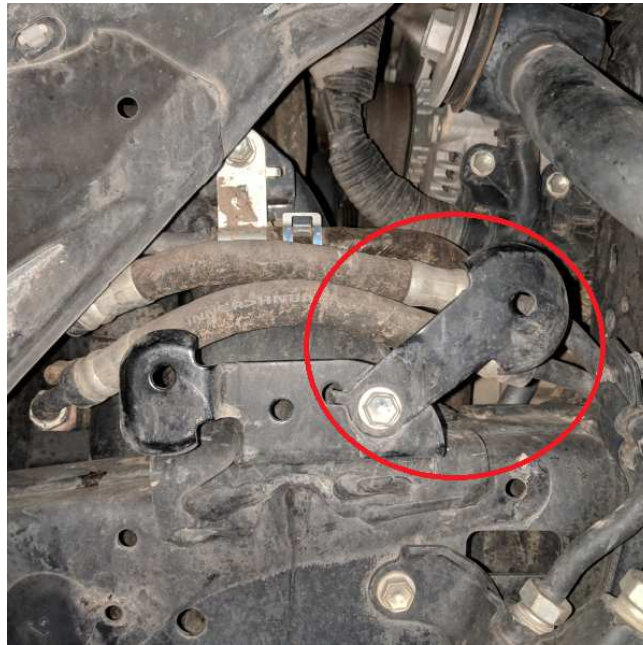
- G. Before finalizing the desired lift height, position the elongated hole (see Figure 1) in the spring seat so it will face inboard once installed on the vehicle.
- H. Once the desired lift height is set, tighten lock ring against spring seat using supplied spanner wrenches.  
**Torque lock ring to spring seat 37 ft-lb (50 Nm).**
- I. Rotate the lower shock mount so it is aligned with the upper mount studs as noted in step E.
- J. Slowly release the spring compressor.

## Left Front Shock Installation Procedure

- K. Remove the 7 clips holding the left side splash guard and remove splash guard.



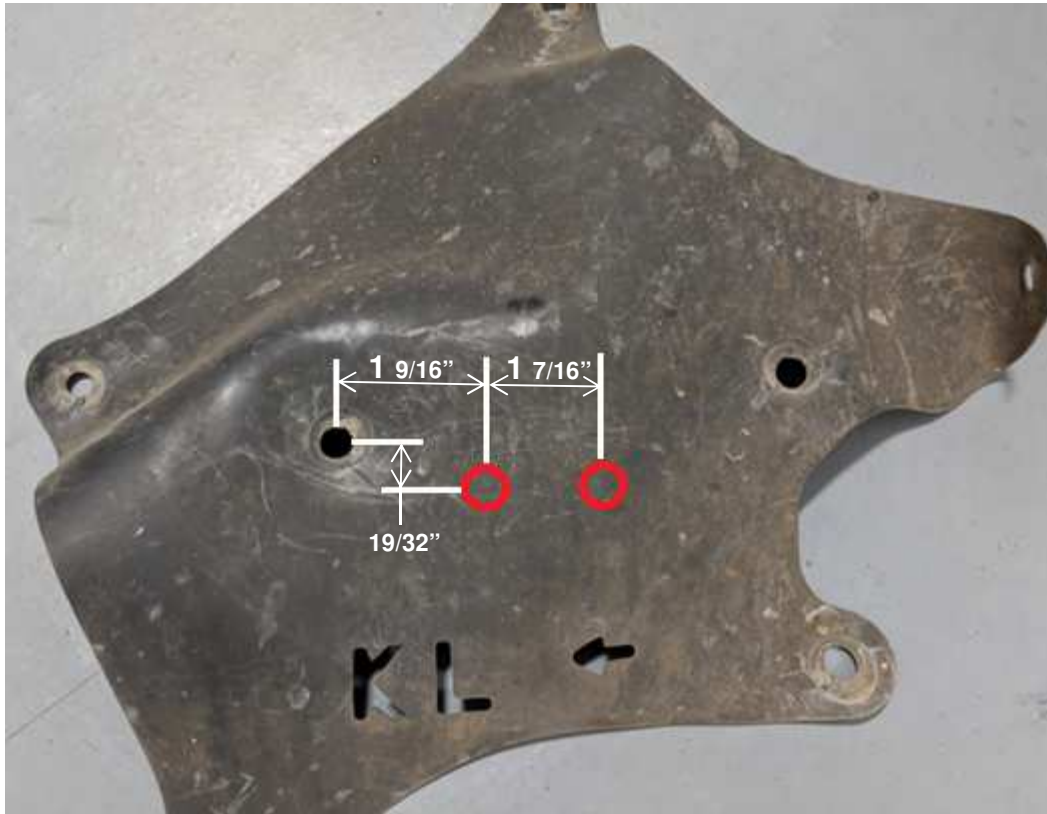
- L. Remove the bolt and bracket circled in red below. Both can be discarded.



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- M. Cut two holes in the splash guard where the red circles are depicted below. Tip: the splash guard can be folded in half and cut with wire cutters.



- N. The result should look something like shown below.



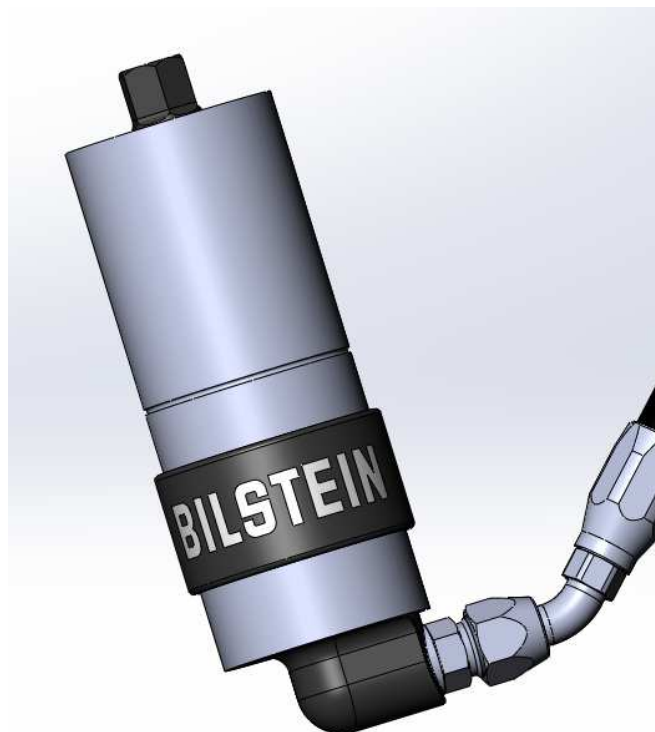
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- O. Reinstall splash guard using 6 of the 7 clips. You should now have access to two holes that will be used to install the Reservoir Mount Plate.



- P. Slide the Reservoir Clamp (BOM item #1) over the reservoir as shown below.

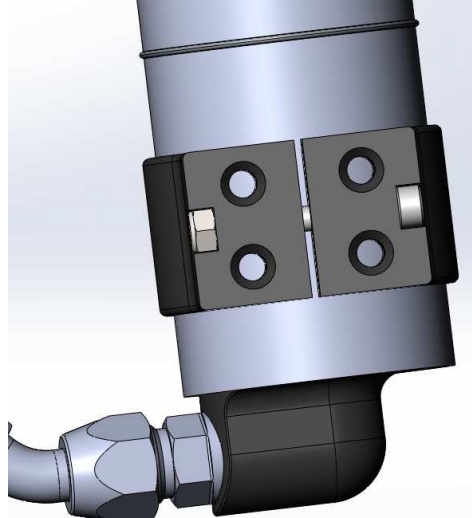




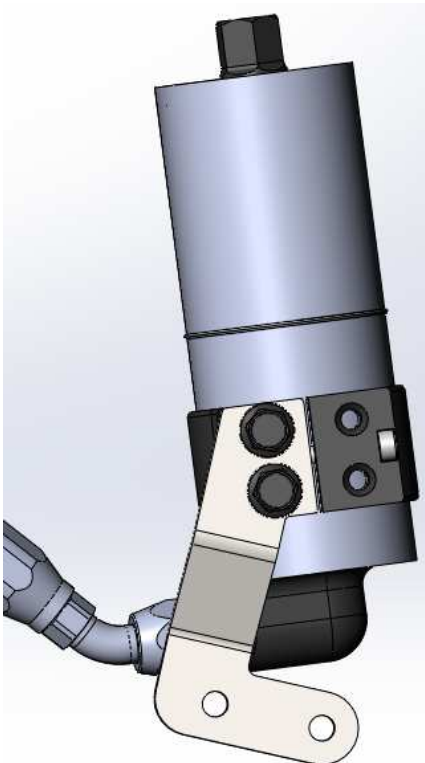
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- Q. Place the Nylock (BOM item #2) in the slot in the Reservoir Clamp as shown below. Then place the Socket Head Cap Screw (BOM item #3) through the hole in the Reservoir Clamp, threading it into the Nylock. Thread in a few turns for now with a 5mm hex but leave loose enough so the Reservoir Clamp can be slid up and down. Install the Circlip (BOM item #4) on the external groove located at the center of the Reservoir.



- R. Prepare the following assembly by applying non-permanent thread locker to two Flange Head Cap Screws (BOM item #6). Mount the Reservoir Clamp to the Reservoir Mount Plate (BOM item #5) as shown below using the two Flange Head Cap Screws. Tighten using a 13mm socket.  
**Torque both Flange Head Cap Screws to 18 ft-lb (25 Nm).**



back side view



front side view

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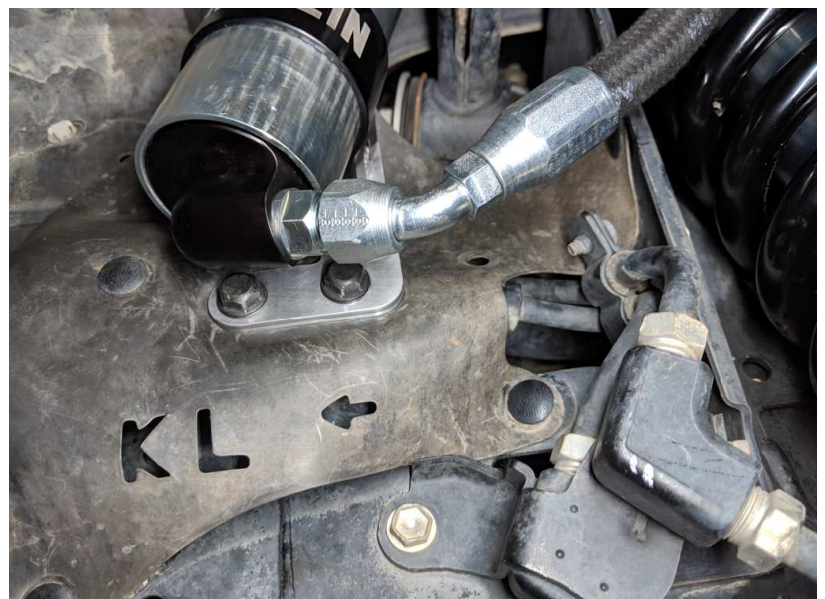
- S. Install the shock onto the vehicle as shown below. Use the three Flange Locknuts (BOM item #10) and a 15mm socket to attach the upper mount. Leave reservoir hanging temporarily.  
**Torque Flange Locknuts to 33 ft-lb (45 Nm).**
- T. Attach the lower shock mount with the OE shock bolt and nut that was removed in Step A.  
**Torque lower OE shock bolt and nut to service manual specification.**



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- U. Mount the reservoir assembly using the two holes under the splash guard that were shown in step O. Apply non-permanent thread locker to two Flange Head Cap Screws (BOM item #6). Mount the reservoir assembly as shown below using the two Flange Head Cap Screws and one Serrated Flange Nut (BOM item #7). Place one Flange Head Cap Screw through the right side hole in the Reservoir Mount Plate and thread into the threaded hole on the vehicle (this is the same hole that the OE bolt was removed from in step L). Place the other Flange Head Cap Screw through the left side hole in the Reservoir Mount Plate and through the existing hole on the vehicle. Thread on the Serrated Flange Nut from the backside. Tighten both Flange Head Cap Screws using a 13mm wrench. The serrations will hold the nut in place while the left screw is torqued.  
**Torque Flange Head Cap Screws to 18 ft-lb (25 Nm).**



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- V. Re-attach and torque outer tie rod (if removed) and upper control arm to knuckle ball joint nut according to service manual specifications.
- W. Slide the reservoir down in the clamp so the Circlip is resting on the top side of the clamp. Position the reservoir as shown on the previous page in step U and confirm it is not contacting anything on the vehicle. Confirm the reservoir hose is not contacting the upper control arm (at full droop). If it is, create some clearance by rotating the reservoir so it pulls the hose fitting in-board. Tighten the Socket Head Cap Screw (BOM item #3) that was installed in step Q.  
**Torque the Socket Head Cap Screw to 6 ft-lb (8 Nm).**

## Right Front Shock Installation Procedure

- X. Remove the splash guard clip and rectangular frame hole plug circled in red below. Tuck back splash guard.



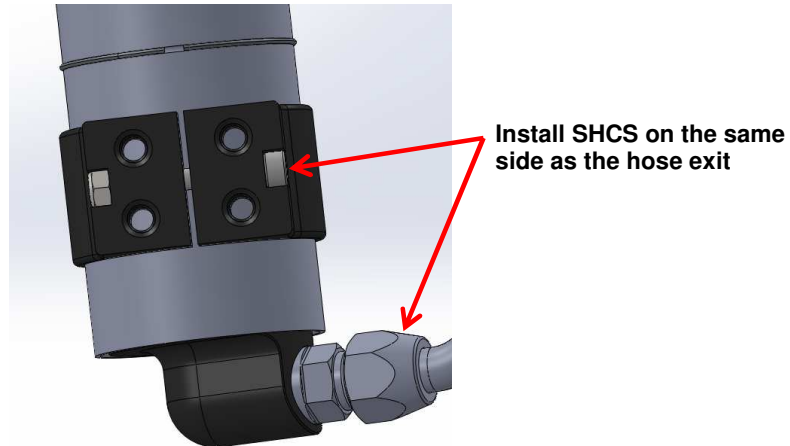
- Y. Slide the Reservoir Clamp (BOM item #1) over the reservoir as shown below.



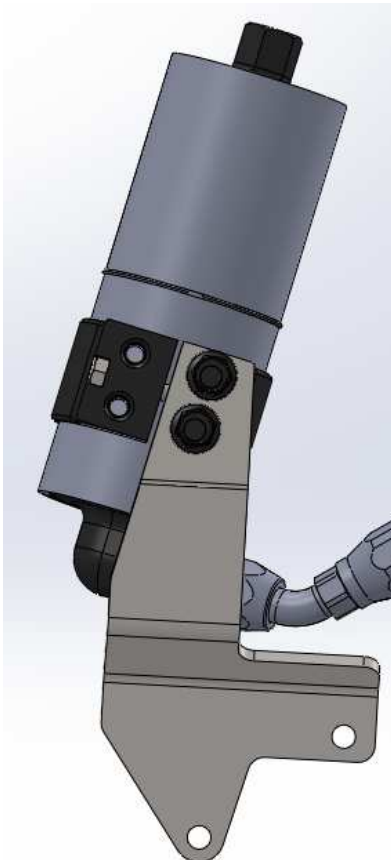
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- Z. Place the Nylock (BOM item #2) in the slot in the Reservoir Clamp as shown below. Then place the Socket Head Cap Screw (BOM item #3) through the hole in the Reservoir Clamp, threading it into the Nylock. Thread in a few turns for now with a 5mm hex but leave loose enough so the Reservoir Clamp can be slid up and down. Install the Circlip (BOM item #4) on the external groove located at the center of the Reservoir.



- AA. Prepare the following assembly by applying non-permanent thread locker to two Flange Head Cap Screws (BOM item #6). Mount the Reservoir Clamp to the Reservoir Mount Plate (BOM item #11) as shown below using the two Flange Head Cap Screws. Tighten using a 13mm socket.  
**Torque both Flange Head Cap Screws to 18 ft-lb (25 Nm).**



back side view



front side view

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BB. Install the shock onto the vehicle as shown below. Use the three Flange Locknuts (BOM item #10) and a 15mm socket to attach the upper mount. Leave reservoir hanging temporarily.

**Torque Flange Locknuts to 33 ft-lb (45 Nm).**

CC. Attach the lower shock mount with the OE shock bolt and nut that was removed in Step A.

**Torque lower OE shock bolt and nut to service manual specification.**



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DD. Mount the reservoir assembly to the frame with the two holes shown below. Apply non-permanent thread locker to two Flat Head Screws (BOM item #13). Have another set of hands hold the reservoir assembly in place. Hold the Serrated Flange Nuts (BOM item #7) on the inside of the frame through the rectangular hole with the Installation Tool (BOM item #12). Then, thread the two Flat Head Screws through the holes in the Reservoir Mount Plate and frame, and into the Serrated Flange Nuts. Tighten down the Flat Head Screws with a 5mm hex. Once they are snug, the Installation Tool can be removed. The serrations will hold the nuts in place while the screws are torqued. **Torque Flat Head Screws to 16 ft-lb (22 Nm).**



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- EE. Re-install the rectangular frame hole plug that was removed in step X.
- FF. Re-attach and torque outer tie rod (if removed) and upper control arm to knuckle ball joint nut according to service manual specifications.
- GG. Slide the reservoir down in the clamp so the Circlip is resting on the top side of the clamp. Position the reservoir as shown above and confirm it is not contacting anything on the vehicle. Confirm the reservoir hose is not contacting the upper control arm (at full droop). If it is, create some clearance by rotating the reservoir so it pulls the hose fitting in-board. Tighten the Socket Head Cap Screw (BOM item #3) that was installed in step Z.  
**Torque the Socket Head Cap Screw to 6 ft-lb (8 Nm).**



## ABS Line Relocation Bracket Installation (Both Sides)

Pictures are shown of the right front. The left front is a mirror image.

HH. Clip and remove the OE zip tie shown in the image below (circle #1) and remove ABS line from bracket (circle #2). Be careful to not damage the ABS line during this process.



- II. Remove OE ABS line bracket by removing the hex head cap screw with a 10mm socket. Note: picture is of non-KDSS 4Runner model, disregard sway bar end link.
- JJ. Install the ABS Line Relocation Bracket (BOM item #14) as shown below with the same hex head cap screw that was removed in the previous step. Secure ABS line with two zip ties (BOM item #9) as shown below. Trim excess zip tie length after installation.



front view



back view

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KK. Repeat steps HH to JJ for the left front with BOM item #8.

LL. Check wheel alignment and adjust to the vehicle manufacturer's specifications. This completes the installation, unless the "exposed thread" dimension shown in Step F (page 4) is set higher than 1".

**If the "exposed thread" dimension shown in Step F (page 4) is set higher than 1", continue on to steps MM and NN:**

MM. Remove original chassis jounce bumpers (one per side) according to vehicle manufacturer's procedures.

NN. Install the supplied spacer washers (located in the plastic bag with this instruction) as shown in two the pictures below and reinstall the jounce bumpers in their original positions. Torque to 27 N·m (20 lb·ft).



**Final left front (driver) 41-298381 B8 8112 shock installed on vehicle:**



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Final right front (passenger) 41-298374 B8 8112 shock installed on vehicle:

