



## INSTALLATION INSTRUCTIONS

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6511, 6512, 6513, 6514, 6515

4" Hanger and Shackle Kit

1999-Current Chevrolet Silverado/GMC Sierra

**NOTE: THESE KIT FITS SHORT BED TRUCKS ONLY**

**DO NOT USE THESE KITS FOR LONG BED TRUCKS**

Thank you for being selective enough to choose our high quality BELLTECH PRODUCT. We have spent many hours developing our line of products so that you will receive maximum performance with minimum difficulty during installation.

- Note: Confirm that all of the hardware listed in the parts list is in the kit. **Do not** begin installation if any part is missing. Read the instructions thoroughly before beginning this installation.
- Warning:** **DO NOT** work under a vehicle supported by only a jack. Place support stands securely under the vehicle in the manufacturer's specified locations unless otherwise instructed.
- Warning:** **DO NOT** drive vehicle until all work has been completed and checked. Torque all hardware to values specified.
- Reminder: Proper use of safety equipment and eye/face/hand protection is absolutely necessary when using these tools to perform procedures!
- Note: It is very helpful to have an assistant available during installation.

### RECOMMENDED TOOLS:

- Properly rated floor jack, support stands, and wheel chocks
- Combination wrench set
- Torque wrench: 0-100 lb ft. range
- Ratcheting socket wrench and sockets set
- Safety Glasses

Note: It is very helpful to have an assistant during installation.

**SAFETY REMINDER: PROPER USE OF SAFETY EQUIPMENT AND EYE/FACE/HAND PROTECTION IS ABSOLUTELY NECESSARY WHEN USING THESE TOOLS TO PERFORM PROCEDURES!**

### KIT INSTALLATION

As this is a relatively complex installation, **we recommend** that a qualified mechanic at a properly equipped repair facility perform it. We also recommend that the installation be performed on a firm, level surface, such as seasoned asphalt or concrete. **The use of safe and properly maintained equipment is very important!** In the interest of maintaining rear axle to chassis alignment, we recommend performing this installation on **only one side of the vehicle at a time.**

1. Block the front wheels of the vehicle with appropriate wooden blocks or wheel chocks. Loosen, but **DO NOT REMOVE** the rear wheel lug nuts.
2. From the rear of the vehicle, place a floor jack (properly rated for the vehicle's weight) under the center section of the rear axle housing (Photo 1). Raise the rear wheels of the vehicle with a floor jack.
3. Position a set of jack stands, one per side and rated for the vehicle's weight, so that they contact the

frame rail area forward of the front spring hangers as shown (Photo 2). Slowly lower the vehicle onto the stands and check that they properly and securely contact the frame rails.

4. Check for safe vehicle stability before proceeding under the vehicle to begin the following procedures.

Remove the rear wheels and tires.

5. Removal of the spare tire, mounted forward of the rear bumper, is recommended-but not required. Gaining access to areas of the rear chassis will be facilitated when the spare tire is removed. If removal of the spare tire is desired, follow the instructions described in your vehicle Owner's Manual.
6. If so equipped, remove the rear trailer hitch by loosening the bolts securing the assembly to the rear bumper and rear frame section. This step is necessary so that the upper rear shackle bolts can be removed from the rear shackles above the frame rails (See Steps below).
7. With the floor jack supporting the rear axle housing center section, raise the rear axle approximately 1 inch to unload the passenger's side leaf spring pivot bolt at the front spring hanger. **NOTE: DO NOT** lift the vehicle from the jack stand supports!
8. While supporting the forward leaf spring end, loosen and remove the forward leaf spring eyebolt and nut from the passenger's side of the vehicle (Photo 3). **To avoid injury, use caution when working with leaf springs as they may be loaded and under tension.**
9. With a pry bar, or other appropriate tool, disengage the forward eye of the leaf spring from the front spring hanger. Lower the rear axle housing to allow the spring to completely clear the forward spring hanger. **CAUTION: DO NOT allow the rear axle housing to drop to the point where any brake lines or hoses come under any tension.**
10. **NOTE:** Be careful to avoid damaging any lines and/or wires that are located around and behind the frame rail sections during the following steps...
11. **(Step A1)** Using a die grinder equipped with a cutoff wheel, or similar tool, carefully grind slots in the heads of the rivets that secure the forward spring hanger to the frame rail (Photo 4). Slotting the rivet heads facilitates rivet head removal in the following step. Be careful to avoid grinding sparks from contacting the exterior paint surfaces of the vehicle. **CAUTION: Always wear appropriate eye/face/hand protection when using power tools.**
12. **(Step A2)** Using an air powered chisel, or similar tool, remove the slotted heads of the stock hanger rivets, being careful not to damage the frame rail and/or mounting holes (Photo 5). **CAUTION:** Always wear appropriate eye/face/hand protection when using power tools.
13. **(Step A3)** Using an air powered hammer and punch, or other suitable tool, punch the remaining portions of the rivet shanks through the hanger and frame rail from the outside (Photo 6). Remove the stock hanger from the frame rail.  
**NOTE: Enlarging the chassis rivet holes by drilling is no longer required! Spring hangers and hardware have been modified to accept the stock rivet hole. Modified March 2005**
14. **(Step B1)** Place the kit-supplied hanger marked "R" for Right, (Passenger's side) over the front spring eye and align the holes in the hanger and spring eye (Photo 8). Install the forward spring pivot bolt, from the inside, through the hanger and the spring eye so that the nut faces the OUTSIDE. **NOTE:** The spring pivot bolt must be installed from the inside of the hanger prior to mounting hanger to frame rail, with the spring pivot bolt head located between the frame rail and new forward spring hanger. Using a wrench to hold bolt head between frame and hanger, install the nut but **do not completely tighten at this time.**
15. **(Step B2)** Using the jack, raise the rear end housing so that the hanger aligns with the mounting holes in the frame rail. It may be necessary to use a punch or similar object to help align the holes.
16. **(Step B3)** Install the four kit supplied 7/16-20 x 1 ¼ hex head bolts, 1/2" SAE flat washers under bolt heads and under nuts, and 7/16-20 lock nuts, and torque the bolts to 60 ft-lb. (Photo 9).

17. **(Step B4)** Place a wrench on the front spring pivot-bolt head, between the frame and spring hanger, and torque the nut to 142 ft-lb.
18. With the floor jack still supporting the rear axle housing center section, again raise the rear axle approximately 1 inch to unload the driver's side leaf spring pivot bolt at the front spring hanger.
19. While supporting the forward leaf spring end, loosen and remove the forward leaf spring eyebolt and nut from the driver's side of the vehicle
20. With a pry bar, or other appropriate tool, disengage the forward eye of the leaf spring from the front spring hanger. Lower the rear axle housing to allow the spring to completely clear the forward spring hanger. **CAUTION: Do not allow the rear axle housing to drop to the point where any brake lines or hoses come under any tension.**
21. Follow Steps A1-3 above to remove the driver's side front spring hanger from the frame. **CAUTION: When driving out the rivets on the driver's side of the vehicle, be aware that the fuel tank is located directly behind the frame rail. Be careful not to damage the fuel tank or other components located in this area of the vehicle.**
22. In order to install the driver's side front spring hanger, the fuel tank must be disengaged from its' frame mounts. The tank can then be shifted towards the center of the vehicle to gain access to the backside of the driver's side frame section. **CAUTION-CAUTION-CAUTION:** The fuel tank is heavy, especially when containing a full tank of fuel. Extreme care should be used when working with the fuel tank and other fuel system components. If possible, the following procedure should be conducted with a small amount of fuel in the tank. Remember that gasoline is flammable and its' vapors are explosive. Avoid all sources of ignition and/or flame when working with the vehicles fuel system
23. Support the fuel tank with properly rated stands or straps. If stands are used, place sections of wood under the tank to distribute its' weight over a larger portion of the tank's underside. Be careful not to damage the tank or other components of the fuel system.
24. So that the fuel tank can be lowered, open the gas filler door located on the driver's side bed panel, and remove two T-27 Torx™ head screws that attach the plastic filler neck to the bed (Photo 10). Also remove the plastic-retaining rivet, located below the fuel filler cap, by lifting out center and pulling out through hole in side bed panel.
25. Two straps that attach the fuel tank to the frame, located under the driver's side rear section of the vehicle, must also be removed.
26. Locate and remove the two bolts attaching the straps to the frame (Photo 11). These bolts are located between the driver's side frame section and the fuel tank.
27. Lower the tank slightly and move the tank towards the center of the vehicle, being careful to avoid damaging the wiring and fuel lines attached to the tank.
28. Follow Steps B1-5 above to install the driver's side front spring hanger to the frame. Be sure to install the front spring hanger marked "L" for left (driver's side).
29. Lift and locate the fuel tank back into its' original position.
30. Re-install the two tank straps and bolts. Tighten and torque the fuel tank strap bolts to 36 ft-lb.
31. Re-install the two T-27 Torx™ head screws that attach the plastic filler neck to the bed. From the inside of the wheel well, reach up and insert plastic-retaining rivet and push in center with other hand from outside to lock.
32. **(Step C1)** While supporting the rearward passenger's side leaf spring end, loosen and remove the rear leaf spring shackle (top) nut and rear leaf spring eyebolt and nut (bottom) (Photo 12). The top shackle eyebolt can be removed by raising the rear axle, with the floor jack, so that the leaf spring bolt can be removed over the top of the frame section, between the frame rail and the underside of the bed floor.
33. **(Step C2)** Install the kit supplied rear shackle over the eye of the leaf spring and align the holes.

34. **(Step C3)** Reinstall the original upper bolt through the shackle and spring from the inside (same orientation as when removed). Thread the original nut onto the bolt but **DO NOT COMPLETELY TIGHTEN** the nut at this time (Photo 13). The fasteners will be tightened later, after the suspension is loaded with the vehicles' weight (See Step F, below).
35. **(Step C4)** Using the floor jack as necessary, lower the spring end to align the holes in the rear spring hanger with the hole in the shackle bushing.
36. **(Step C5)** Re-install the original bolt from the inside and thread the original nut on from the outside. Again, **DO NOT TIGHTEN** the nut at this time (See Step F, below).
37. Repeat Steps C1-5 above for the driver's side of the vehicle.
38. Loosen the nut attaching the stock rear axle housing bump stop, located on the inside section of the passenger's side frame rail (Photo 14), and remove the stop.
39. Install the kit supplied bump stop to the frame rail using the same mounting hole used by the original bump stop (Photo 15). Torque the mounting nut to 18 ft-lb.
40. With the vehicle still supported by jack stands, brace the rear axle housing with a floor jack properly rated for the vehicle's weight.
41. **(Step D1)** Remove the passenger side (RH) U-bolt nuts, lower axle retaining plate, and the U-bolts (Photo 16) as necessary.
42. **(Step D2)** Lower the rear axle to gain access to the leaf spring pack center bolt. **CAUTION: Do not lower the rear axle to the point that any of the brake system components come under any tension.**
43. **(Step D3)** Secure the leaf spring packs together using C-clamps (Photo 17A), or other suitable tool, and removes the original spring center bolt (Photo 17B).
44. **(Step D4)** Install the kit supplied spring center bolt and spacer from the bottom side of the leaf spring pack (Photo 18). Install the kit supplied nut from the topside of the spring, (Photo 19) and while holding the bolt head with Vise grips® or other appropriate tool, torque to 45 ft-lb. If necessary, trim off any excess spring center bolt that extends through the nut using a die grinder equipped with a cutoff wheel or other appropriate tool. **CAUTION: Always wear eye protection when using power tools.**
45. **(Step D5)**(Standard Cab Models Only). Install the kit supplied 3° pinion angle correction wedge over the axle housing pad hole with the thicker portion of the wedge facing toward the FRONT of the vehicle (Photo 20)
46. **(Step D6)** Raise the rear axle housing up to capture the pinion wedge between the rear axle housing pad and the leaf spring pack. Check to make sure that the head of the new leaf spring pack center bolt properly seats and locates into the hole in the axle-housing pad.
47. **(Step D7)** Re-install the OEM U-bolts, lower axle retaining plate, upper U-bolt alignment plate, and U-bolt nuts as necessary. Tighten the U-bolt nuts enough to hold assembly together, but **DO NOT COMPLETELY** tighten until the opposite pinion wedge is installed.
48. Repeat steps D1-7 above for driver's side (LH) of the vehicle.
49. After completing steps D1-7, for both sides of vehicle, fully tighten and torque all eight (8) U-bolt nuts (four (4) per side) to 110 ft-lb. **IMPORTANT!** To insure vehicle safety, recheck U-bolt torque after 10, 100, and 1000 miles.
50. With the vehicle still supported by jack stands, brace the rear axle housing with a floor jack properly rated for the vehicle's weight.
51. **(Step E1)** Loosen, but **DO NOT REMOVE** the passenger side (RH) U-bolt nuts. Loosen the nuts just enough, so that the floor jack can be lowered to allow approximately 1 inch of space to be created between the leaf spring pack and the rear axle housing spring pad.

52. **(Step E2)** (Extended Cab Models Only). Install the kit supplied 1° pinion angle correction wedge over the axle housing pad hole with the thicker portion of the wedge facing toward the REAR of the vehicle (Photo 21)
53. **(Step E3)** Raise the rear axle housing up to capture the pinion wedge between the rear axle housing pad and the leaf spring pack. Check to make sure that the head of the OEM leaf spring pack center bolt properly seats and locates into the hole in axle housing pad.
54. **(Step E4)** Tighten the U-bolt nuts enough to hold assembly together, but **DO NOT COMPLETELY** tighten until the opposite pinion wedge is installed.
55. Repeat steps E1-4 above for driver's side (LH) of the vehicle.
56. After completing steps E1-4, for both sides of vehicle, fully tighten and torque all eight (8) U-bolt nuts (four (4) per side) to 110 ft-lb. **IMPORTANT!** To insure vehicle safety, re-check U-bolt torque after 10, 100, and 1000 miles.

### **Extended Cab Models: Driveline Vibrations**

The extended cab model GM trucks utilize a two-piece drive shaft design with a center-carrier support bearing assembly. GM extended cab driveline vibrations are due, we believe, to inherent manufacturing tolerance issues relating to new frame assembly technologies as well as the two-piece driveline configuration.

One significant factor is driveline center-carrier bearing support mount position. We have determined that many center-carrier support mounts are improperly positioned in such a way, that the bearing itself is not centered along the frame of the vehicle. That is, the carrier bearing is not centered left to right. This non-alignment of the driveline creates asymmetry in the system, and thus vibration. This condition can be relatively easily detected by stretching a string from the transmission centerline to the rear differential pinion centerline (Photo 29), and sighting the driveline from the rear of the vehicle. When a noticeable difference exists between the reference string and the driveline centerline, a vibration will almost surely be present. Typically, this condition cannot be significantly improved by normal methods of driveline/pinion angle correction.

**! WE RECOMMEND**, for vehicles exhibiting unacceptable vibrations, the following procedures be performed to check driveline alignment.

- 1.) Block the front wheels of the vehicle with appropriate wooden blocks or wheel chocks. Lift and support the vehicle (as described above).
- 2.) Stretch a string from the center of the transmission tail shaft to the center of the rear axle pinion housing. On the transmission tail shaft, use the casting parting line (Photo 28) for reference to determine centerline position. On the axle pinion housing, align the string with the center of the pinion yoke. Use tape to attach the string to the driveline components as shown
- 3.) With the transmission in neutral, rotate the rear wheels until the central U-joint bearing cap, located between the front and rear drive shafts just aft of the center-carrier, is aligned parallel to the ground surface (Photo 24).
- 4.) Measure the distance between the center of the U-joint bearing cap and the string. Make sure that the string is straight by sighting down it from the rear of the vehicle.
- 5.) If the driveline centerline offset exceeds ¼", we recommend installing our center-carrier alignment kit (P/N 4994). This kit allows fine-tuning of the side-to-side center-carrier bearing position to minimize driveline vibration.

After installing the Belltech 4" Rear Lowering Kit, shorter than stock shock absorber units are required to prevent bottoming out. We recommend using only quality Belltech Street Performance™ P/N 2212FF or NitroDrop2™ P/N 8504 high-performance shocks for your GM truck application.

- Re-install the factory hitch and spare tire (if removed).
- Re-install rear wheels and lug nuts. Lift vehicle with floor jack and remove jack stands.

Place vehicle on ground. Torque rear wheel lug nuts to 90-100 ft-lb. in a crossing pattern. **IMPORTANT!** Your GM Truck is equipped with four-wheel disk brakes. It is critical that lug nuts on disk brake systems be properly torqued to prevent warping brake rotors.

- (Step F) Tighten and torque rear shackle bolts to 90-100 ft-lbs. with suspension loaded with vehicle's full weight. **IMPORTANT!** To insure vehicle safety, re-check the rear shackle bolt torque after 10, 100, and 1000 miles.
- Road test the vehicle after completing this installation. **IMPORTANT!** To prevent any dangerous situations from occurring in the event of losing tire air pressure, make sure that no suspension/chassis components extend below the lower portion of the wheel rims.
- Check all fasteners after 10, 100, and 1000 miles.

### **Hardware List for Kits 6511, 6512, 5613**

Quantity	Part Number	Description
1	6512-010	LH Front Spring Hanger
1	6512-020	RH Front Spring Hanger
2	6400-100	Spring Shackle
8	110650	7/16"-20 x 1 1/4" Hex Head Bolt Grade 8
8	110303	7/16"-20 Stover Lock Nut
16	110645	7/16" Flat Washer
2	4915-001	Bump Stop
2	110257	Coupling Nut 3/8" -24 x 1 1/8"
2	112158	Spring Bolt 3/8" -24 x 3.5"
2	112432	Spacer Tube .625" x 120" x .25"
2	4976-001	Pinion Shim 3°

### **Hardware List for Kits 6514, 6515**

Quantity	Part Number	Description
1	4995-001	Center C.B. Hoop Bracket
1	4995-003	Center C.B. Vertical Bracket
1	4995-887	Template C.C.B. Install
2	6400-100	Shackle Assy W/Bushing
1	6512-010	Hanger LH
1	6512-020	Hanger RH
1	110060	HH Screw 1/4" x 1 1/2"
1	110100	Flat Washer 1/4"
4	110255	Nylon Insert Lock Nut 3/8" -16
8	110625	Flat Washer 3/8"
4	112098	HHCS 3/8" -16 x 1 1/2"

1	112432	Spacer Tube .625" x .120" x .25"
8	110303	Stover Lock Nut 7/16" -20
8	110650	HHCS 7/16" -20 x 1 1/4"
16	110645	Flat Washer 7/16"
2	4915-001	Bump Stop
2	4973-001	Pinion Shim 1°





