# Installation instructions



## 2" / 4"Coilover Installation Instructions

Ford F-250, F-350 Superduty 4WD | 2005-2016

## Read And Understand All Instructions And Warnings Prior To Installation Of System And Operation Of Vehicle.



Your truck is about to be fitted with the best suspension system on the market today. That means you will be driving the baddest looking truck in the neighborhood, and you'll have the warranty to ensure that it stays that way for years to come.

Thank you for choosing BDS Suspension!

#### **BEFORE YOU START**

BDS Suspension Co. recommends this system be installed by a professional technician. In addition to these instructions, professional knowledge of disassembly/ reassembly procedures and post installation checks must be known.

### **FOR YOUR SAFETY**

Certain BDS Suspension products are intended to improve off-road performance. Modifying your vehicle for off-road use may result in the vehicle handling differently than a factory equipped vehicle. Extreme care must be used to prevent loss of control or vehicle rollover. Failure to drive your modified vehicle safely may result in serious injury or death. BDS Suspension Co. does not recommend the combined use of suspension lifts, body lifts, or other lifting devices. You should never operate your modified vehicle under the influence of alcohol or drugs. Always drive your modified vehicle at reduced speeds to ensure your ability to control your vehicle under all driving conditions. Always wear your seat belt.

### **BEFORE INSTALLATION**

- Special literature required: OE Service Manual for model/year of vehicle. Refer to manual for proper disassembly/reassembly procedures of OE and related components.
- Adhere to recommendations when replacement fasteners, retainers and keepers are called out in the OE manual.
- Larger rim and tire combinations may increase leverage on suspension, steering, and related components. When selecting combinations larger than OE, consider the additional stress you could be inducing on the OE and related components.
- Post suspension system vehicles may experience drive line vibrations.
   Angles may require tuning, slider on shaft may require replacement,
   shafts may need to be lengthened or trued, and U-joints may need to be replaced.
- Secure and properly block vehicle prior to installation of BDS Suspension components. Always wear safety glasses when using power tools.
- If installation is to be performed without a hoist, BDS Suspension Co. recommends rear alterations first.
- Due to payload options and initial ride height variances, the amount
  of lift is a base figure. Final ride height dimensions may vary in
  accordance to original vehicle attitude. Always measure the attitude
  prior to beginning installation.



## TIRES AND WHEELS

4-1/2" backspace wheels with 12.50 width tire are recommended for tire to reservoir hose clearance. Stock wheels are not recommended.



## **BEFORE YOU DRIVE**

Check all fasteners for proper torque. Check to ensure for adequate clearance between all rotating, mobile, fixed, and heated members. Verify clearance between exhaust and brake lines, fuel lines, fuel tank, floor boards and wiring harness. Check steering gear for clearance. Test and inspect brake system.

Perform steering sweep to ensure front brake hoses have adequate slack and do not contact any rotating, mobile or heated members. Inspect rear brake hoses at full extension for adequate slack. Failure to perform hose check/ replacement may result in component failure. Longer replacement hoses, if needed can be purchased from a local parts supplier.

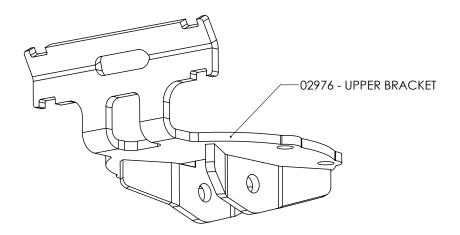
Perform head light check and adjustment.

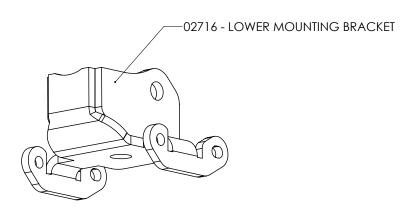
Re-torque all fasteners after 500 miles. Always inspect fasteners and components during routine servicing.

## **CONTENTS OF YOUR KIT**

Box Kit		
Part #	Qty	Description
02716	2	Lower Coilover Mount
02976	2	Upper Coilover Mounting Bracket
	6	Zip Tie
953	1	Bolt Pack
	2	14mm-2.00 x 30mm Bolt
	2	14mm Flat Washer
	2	7/16" Clamp w/ 0.281 Hole
	4	1/4"-20 x 3/4" Bolt
	4	1/4"-20 Nylock Nut
	8	1/4" SAE Washer
	4	#10-24 x 3/4" Machine Screw
	4	#10-24 Serrated Edge Flanged Nut
	4	#10 SAE Washer

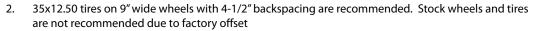
Box Kit			
Part #	Qty	Description	
976	1	Bolt Pack	
	4	1/2"-13 x 2-3/4" bolt - grade 8 - yellow zinc	
	8	1/2" SAE Thru Hardened washer - yellow zinc	
	4	1/2"-13 Prevailing Torque Nut - Yellow Zinc	
	8	7/16"-14 x 1-1/4" Bolt - grade 8 - yellow zinc	
	16	7/16" SAE Washer - yellow zinc	
	8	7/16"-14 Prevailing Torque Nut - Yellow Zinc	
	2	5/16"-18 x 3-1/2" bolt - grade 8 - yellow zinc	
	2	5/16"-18 x 4-1/2" Bolt - Grade 8 - yellow zinc	
	4	5/16" SAE Thru-hardened washers - yellow zinc	
	2	5/16"-18 Prevailing torque nut - yellow zinc	

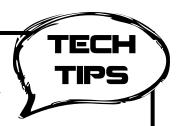




## TROUBLESHOOTING INFORMATION FOR YOUR VEHICLE

1. Kit is designed to work with 2" and 4" of lift, this is only the installation instructions for installation of the coilover shocks and mounting brackets, does not include the installation instructions for any other applicable kit components which must be purchased separately.





## INSTALLATION INSTRUCTIONS

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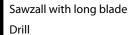
## SPECIAL TOOLS

1. Park vehicle on clean, flat, and level surface.

2. Raise front of vehicle and support frame rails with jack stands.

3. Remove the front wheels.

- 4. Support the front axle with a hydraulic jack.
- 5. Disconnect the sway bar links from the sway bar, this will allow the axle to droop out enough. (Fig 1)



## FIGURE 1



6. Remove the front shocks, retain lower shock hardware.

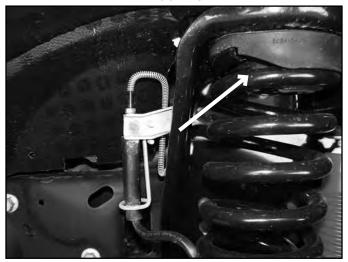
7. Disconnect the brake line bracket from the factory lower coil seat (Fig 2). Disconnect the ABS lines from the backside of the lower coil seat.

FIGURE 2



8. Lower the axle and remove the factory coil springs and upper coil spring isolator. Take care not to over extend any brake, ABS, or vacuum lines. (Fig 3)

FIGURE 3



9. Remove the lower coil spring seat from the top of the axle, it will not be reinstalled.

## **UPPER COIL BUCKET MODIFICATION**

10. Trim the upper coil spring centering tube from the factory mount with a sawzall. Ensure the cut is flush with the mounting surface. (Fig 4a, 4b)

FIGURE 4A



FIGURE 4B



- 11. Disconnect the module from the driver's side coil bucket (attached in 3 places), may not be present on all model years / engine configurations. Move the module up so that it is not damaged when the holes are drilled.
- 12. Place the upper coilover mounting bracket up to the upper mount. Rotate the bracket so that the reservoir bracket is parallel with the frame. (Fig 5)

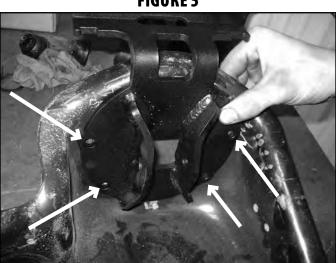
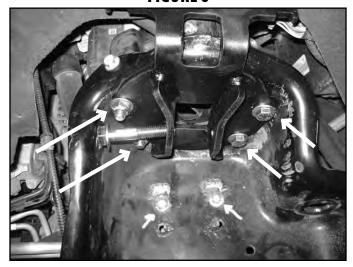


FIGURE 5

13. Mark the center of the holes, remove bracket, and drill out to 15/32" to ½". Make sure the drill does not damage the module on the driver's side (not present on all model year trucks).!

14. Install the bracket with 7/16" hardware, run the bolts from top-down. Do NOT tighten at this time, the mount needs to be loose to install the upper coilover hardware. Thread the nuts on by hand a couple of turns to hold the bracket in place. (Fig 6)

## FIGURE 6



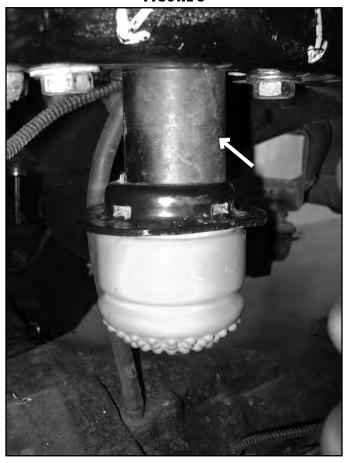
- 15. Install the lower bracket with new 14mm bolt (#953). Tighten to 75 ft-lbs.
- 16. Install the coilover into the upper mounting bracket with ½"x 2-3/4" bolt (#976). Coilovers are marked side specific. Bolt is a tight squeeze to fit into the bracket and between the stock bracket. It may be necessary to loosen the upper mount more to allow the bolt to fit into the mounting bracket.
- 17. Attach the coilover to the lower mounting bracket with  $\frac{1}{2}$ " x 2-3/4" hardware (#976).
- 18. Tighten all coilover and mounting bracket hardware at this time. 7/16" hardware: 45 ft-lbs, ½" 65 ft-lbs.
- 19. Attach the reservoir to the mounting bracket with the included hose clamps. Rotate the reservoir so that the hose is pointed slightly 'inward' for extra tire clearance. (Fig 7)





- 20. Remove the factory bump stop, remove the factory hardware that attaches the cup to the frame.
- 21. Install bump stop spacer (2" tall for 2" kits, 3" tall for 4" kits) and bump stop cup with new 5/16" x 3-1/2"hardware (2" kit) or 4-1/2" hardware (4" kit). Tighten to 25 ft-lbs.

## FIGURE 8



23. Attach the front axle lines to the new lower bracket with included ¼" hardware. Aftermarket brake lines will use the included wire clamp (shown in figure). Additional zip ties are included to retain any ABS / vacuum lines if necessary. (Fig 9) The ABS wire will attach with #10 hardware from bolt pack #953.

FIGURE 9



- 24. Install optional auxiliary shock in factory position with factory hardware if desired.
- 25. Reattach sway bar links to sway bar. Reinstall wheels.
- 26. Cycle steering at full droop and check for adequate clearances
- 27. Lower vehicle to the ground and torque lug nuts to factory specification. Cycle steering to check for adequate clearances.
- 28. Recheck all hardware for proper torque, recheck again after 500 miles.

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   Refer to manual for proper disassembly/reassembly procedures of OE and related components.
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- Larger rim and tire combinations may increase leverage on suspension, steering, and related components. When selecting combinations larger than OE, consider the additional stress you could be inducing on the OE and related components.
- Post suspension system vehicles may experience drive line vibrations.
   Angles may require tuning, slider on shaft may require replacement, shafts may need to be lengthened or trued, and U-joints may need to be replaced.
- Secure and properly block vehicle prior to installation of BDS Suspension components. Always wear safety glasses when using power tools.
- If installation is to be performed without a hoist, BDS Suspension Co. recommends rear alterations first.
- Due to payload options and initial ride height variances, the amount of lift is a base figure. Final ride height dimensions may vary in accordance to original vehicle attitude. Always measure the attitude prior to beginning installation.



## <u>TIRES AND WHEELS</u>

Designed to work with:

35x12.50x17(18)(20) Tire 4-1/2" ~ 5" Backspace Wheel



#### **BEFORE YOU DRIVE**

Check all fasteners for proper torque. Check to ensure for adequate clearance between all rotating, mobile, fixed, and heated members. Verify clearance between exhaust and brake lines, fuel lines, fuel tank, floor boards and wiring harness. Check steering gear for clearance. Test and inspect brake system.

Perform steering sweep to ensure front brake hoses have adequate slack and do not contact any rotating, mobile or heated members. Inspect rear brake hoses at full extension for adequate slack. Failure to perform hose check/replacement may result in component failure. Longer replacement hoses, if needed can be purchased from a local parts supplier.

Perform head light check and adjustment.

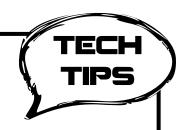
Re-torque all fasteners after 500 miles. Always inspect fasteners and components during routine servicing.

## CONTENTS OF YOUR KIT

123251 - Rad	123251 - Radius Arm Box Kit - DRV			
Part #	Qty	Description		
A241	1	Radius Arm Assembly - DRV Side		
02799	1	Superduty Radius Arm 2"-4"		
868190	1	Superduty Bushing		
97525A430	2	Rivets		
02802	1	Name plate - aluminum		
B1114	1	Bag Kit		
02421	4	Cam plate		
N18MPT	2	M18-2.5 Lock Nut		
02002ZP	2	M18-2.5 x 150 Bolt		
W34SAE	4	3/4" SAE flat washer		
099000	6	Zip Ties		
099002	2	Push Pin Zip Ties		
A242	1	Radius Arm Assembly - PASS Side		
02799	1	Superduty Radius Arm 2"-4"		
868190	1	Superduty Bushing		
97525A430	2	Rivets		
02802	1	Name plate - aluminum		

## TROUBLESHOOTING INFORMATION FOR YOUR VEHICLE

- 1. Recommended to only be used in the factory radius arm mounting locations with 2" to 4" of lift.
- 2. This is only a guide for installation of the radius arms, follow main box kit installation instructions for installation of arms with a complete kit.





## INSTALLATION INSTRUCTIONS

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### <u>SPECIAL TOOLS</u>

- Park the vehicle on a clean, flat surface and block the rear wheels for safety.
- General tools, jacks, jack stands.
- Raise the front of the vehicle and support under the frame rails with jack stands.

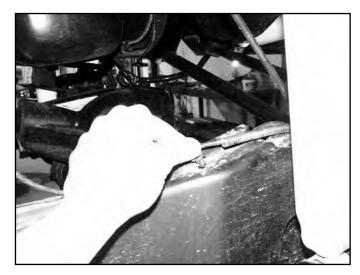
**Tip**As a result of the location of the long radius arm suspension, support locations are limited. Use your best judgment while supporting the vehicle with sufficient strength stands at appropriate locations. The radius arms will need to move freely during this installation as they will be replaced. This step is necessary to dislodge the tapered track bar mount in the follow step.

3. Remove the front wheels.

- Support the front axle with a hydraulic jack. With the axle supported this installation can be performed on both sides at the same time, but is not necessary.
- 5. Remove the ABS line from the metal retaining tab on the radius arm (Fig 1). Pull the plastic retaining clip free from the radius arm (Fig 2).

FIGURE 2 FIGURE 1



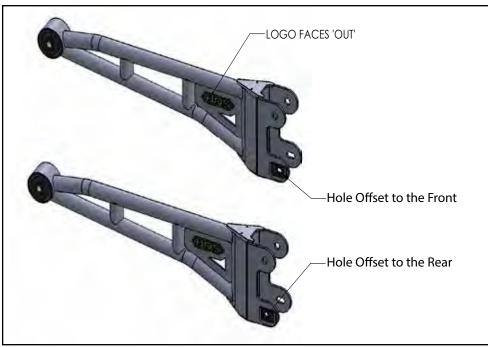


### **RADIUS ARM INSTALLATION:**

Working on one side of the vehicle at a time, remove the stock radius arm and replace with the new one. Install cams into the lower slots with new 18m hardware, and use one of the old lower 18mm nuts on the driver's side upper mount at the axle with factory hardware. Note: The upper bolt at the axle can be removed with the stock shock in place, however, certain aftermaker shocks may need to be disconnected to allow removal of the upper bolt. (Fig 3)

Note: 2005-2016 model year trucks with 2.5" kits hole offset to the rear or kits with front shocks 23" or less. 2005-2016 model year trucks with 4" kits hole offset to the front or kits with front shocks 23" or longer. 2017+ model year trucks with 2.5" or 4" kits hole offset to the rear.





Tighten the front hardware at the axle to 222 ft-lbs. Do not tighten the frame pivot hardware at this time.

- 8. Attach ABS wires to the radius arm with the included zip ties and push pin zip tie where the upper mount at the axle is located. Allow axle to droop out to check for adequate slack.
- 9. Reinstall wheels, lower vehicle to the ground.
- 10. Tighten the radius arm pivot hardware at the frame to 180 ft-lbs.
- 11. Check all hardware for proper torque.
- 12. Torque lug nuts to factory specification.
- 13. Recheck all hardware for proper torque, check again after 500 miles and at regularly scheduled maintenance intervals. An alignment for a caster check is now recommended, but not necessary.

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   Refer to manual for proper disassembly/reassembly procedures of OE and related components.
- Adhere to recommendations when replacement fasteners, retainers and keepers are called out in the OE manual.
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## TIRES AND WHEELS

35x12.50x17(18)(20) Tire 4-1/2" ~ 5" Backspace Wheel



#### **BEFORE YOU DRIVE**

Check all fasteners for proper torque. Check to ensure for adequate clearance between all rotating, mobile, fixed, and heated members. Verify clearance between exhaust and brake lines, fuel lines, fuel tank, floor boards and wiring harness. Check steering gear for clearance. Test and inspect brake system.

Perform steering sweep to ensure front brake hoses have adequate slack and do not contact any rotating, mobile or heated members. Inspect rear brake hoses at full extension for adequate slack. Failure to perform hose check/replacement may result in component failure. Longer replacement hoses, if needed can be purchased from a local parts supplier.

Perform head light check and adjustment.

Re-torque all fasteners after 500 miles. Always inspect fasteners and components during routine servicing.

## CONTENTS OF YOUR KIT

033251 - 2.5" Coil Springs			
	Part #	Qty	Description
	033251R	2	Coil Spring

123251 - Radius Arm Box Kit - DRV			
Part #	Qty	Description	
A241	1	Radius Arm Assembly - DRV Side	
02799	1	Superduty Radius Arm 2"-4"	
868190	1	Superduty Bushing	
97525A430	2	Rivets	
02802	1	Name plate - aluminum	
B1114	1	Bag Kit	
02421	2	Cam plate	
N18MPT	1	M18-2.5 Lock Nut	
02002ZP	1	M18-2.5 x 150 Bolt	
W34SAE	2	3/4" SAE flat washer	
099000	3	Zip Ties	

123252 - Radius Arm Box Kit - PASS			
Part #	Qty	Description	
A242	1	Radius Arm Assembly - PASS Side	
02799	1	Superduty Radius Arm 2"-4"	
868190	1	Superduty Bushing	
97525A430	2	Rivets	
02802	1	Name plate - aluminum	
B1114	1	Bag Kit	
02421	2	Cam plate	
N18MPT	1	M18-2.5 Lock Nut	
02002ZP	1	M18-2.5 x 150 Bolt	
W34SAE	2	3/4" SAE flat washer	
099000	3	Zip Ties	

123202- Front Adjustable Track Bar Kit			
Part #	Qty	Description	
A230	1	Adjustable Trackbar Assembly	
B1068	1	Bag Kit - Adjustable Track Bar	

069408 - Rear 4" Block Kit			
Part #	Qty	Description	
02786	2	4" Superduty Rear Block	
UBT4031	4	5/8" x 3-1/8" x 14" Semi Round U-bolts	

013519 - 5" Rear Block Kit (Optional)			
Part #	Qty	Description	
02414	2	5" Rear Superduty Block	
02415	2	Superduty Rear Spring Plate	
343581500RB	4	3/4" x 3-5/8" x 15" Round U-bolt	
B236	1	Bag Kit	
N34FLG	8	3/4" Serrated Edge Flanged Nut	

## TROUBLESHOOTING INFORMATION FOR YOUR VEHICLE

- 1. Trackbar mounting bolt requires 405 ft-lbs of torque, plan ahead on how to achieve this.
- 2. If installing optional coilovers, there is a seperate instruction sheet for coilover and bracket installation. Follow those steps when it is time to install coilover with bracket.



## INSTALLATION INSTRUCTIONS

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## <u>SPECIAL TOOLS</u>

 Park the vehicle on a clean, flat surface and block the rear wheels for safety.

General tools, jacks, jack stands.

Raise the front of the vehicle and support under the frame rails with jack stands.

**Tip**As a result of the location of the long radius arm suspension, support locations are limited. Use your best judgment while supporting the vehicle with sufficient strength stands at appropriate locations. The radius arms will need to move freely during this installation as they will be replaced. This step is necessary to dislodge the tapered track bar mount in the follow step.

3. Remove the track bar ball joint nut at the axle. (Fig 1) Thread the nut back on a couple of turns. Raise the axle a couple of inches with the jack. Place an appropriate sized pry bar between the axle mount and the track bar. (Fig 2) Lower the axle to pinch the pry bar between the track bar and axle mount. Take your hands off of the pry bar. Continue lowering the axle until the track bar unseats from the taper. Remove the nut and track bar from the ball joint. Save nut.

FIGURE 1



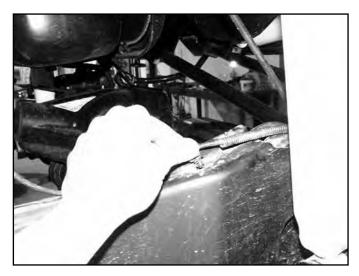
FIGURE 2



- 4. Disconnect the front track bar from the frame mount.
- 5. Remove the stock track bar. Retain all hardware.
- 6. Remove the front wheels.
- 7. Support the front axle with a hydraulic jack. With the axle supported this installation can be performed on both sides at the same time, but is not necessary.
- 8. Disconnect the sway bar links from the axle mounts. Retain hardware.
- 9. Remove the OE shock. Retain lower mounting hardware.
- 10. Remove the ABS line from the metal retaining tab on the radius arm (Fig 3). Pull the plastic retaining clip free from the radius arm (Fig 4).

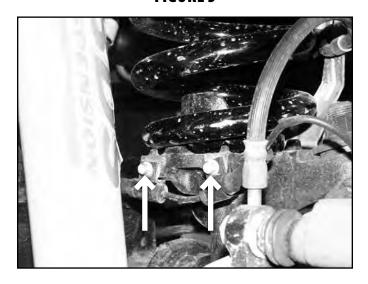
FIGURE 3 FIGURE 4





11. Remove the two bolts mounting the plastic ABS wire clips to the back side of the coil perch (Fig 5). Retain hardware.

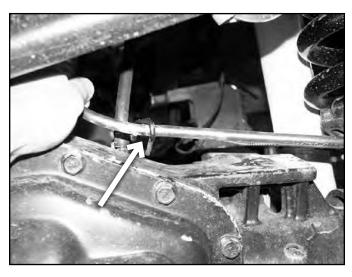
FIGURE 5 FIGURE 6





- 12. Disconnect the brake line bracket from the front of the coil perch (Fig 6). Retain hardware.
- 13. Free the hub vacuum line from the axle (Fig 7, 8).

FIGURE 7 FIGURE 8

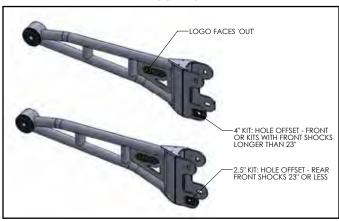




#### **RADIUS ARM INSTALLATION:**

14. Working on one side of the vehicle at a time, remove the stock radius arm and replace with the new one. Install cams into the lower slots with new 18m hardware, and use new 18mm nut on the driver's side upper mount at the axle. (Fig 9)





#### **COIL INSTALLATION**

Note: For Fox 2.5" Coilovers, see separate instruction sheet on how to install the coilovers and bracket at this time.

- 15. Lower the axle until the spring is free and remove the spring from the vehicle. Note: Do not over extend the brake lines.
- 16. Install new coils with the factory rubber isolators located on top of the coils.
- 17. Compress the coils slightly by using a hydraulic jack on the axle. Install new shocks with factory lower hardware and stem washers, bushings, and 1/2" fine thread nut on the upper mount. Tighten the upper mount until the bushings begin to swell. Tighten lower mount to 50 ft-lbs.
- 18. Reattach all brake and vacuum lines to the original locations with the OE mounting hardware. There are provided zip ties for attaching the ABS wire to the radius arm. The rubber grommets on the ABS wire can be slid by spraying the ABS wire with silicone spray.
- 19. Reattach the sway bar links to the axle with the OE hardware and tighten securely.
- 20. Install the wheels and lower the vehicle to the ground. Ensure that the lower cam is orientated correctly in the slot. Tighten radius arm hardware to 150 ft-lbs.

#### TRACKBAR INSTALLATION

- 21. Grease and install bushings and sleeves into track bar. Thread grease zerk into track bar. Remove (4) allen bolts and apply loc-tite to threads.
- 22. Adjust the track bar length (eye to eye) to 37-1/8" for 2-1/2" lift, 37-1/2" for 4" lift.
- 23. Install track bar into vehicle with the grease fitting facing down at the frame mount with factory bolt. Check the trackbar collar to frame crossmember for adequate clearance. A small amount of grinding on the frame crossmember lip may be required for clearance to the trackbar under compression clearance. (Fig Trackbar Clearance Check)

### FIGURE TRACKBAR CLEARANCE CHECK



- 24. Attach the axle mount to the track bar. It may be necessary to have an assistant turn the wheel to get the mount to line up. Square the mount up to the factory joint. Attach with factory nut. Tighten to 184 ft-lbs
- 25. Ensure the axle is square under the vehicle. Additional adjustment of the track bar collar may be required. Do not extend past 37-5/8" eye-eye measurement, due to the maximum length of the factory drag link.
- 26. Tighten pinch bolt collar. Tighten to 40 ft-lbs, check the turnbuckle to ensure that it will not rotate, additional tightening may be required.
- 27. Tighten track bar hardware at the frame to 405 ft-lbs. Grease the track bar mount at the frame.
- 28. Install new brake line drop brackets onto the side of the frame with factory hardware and clip. (Fig 10a, 10b)

FIGURE 10A FIGURE 10B





- 29. Check all hardware for proper torque.
- Adjust steering wheel to center.
- 31. Check hardware after 500 miles.

## **REAR INSTALLATION 4" BLOCK KIT (5" BLOCK - SEE 013518-013519 INSTRUCTION SHEET)**

Rear Installation Note: The factory rear block will vary depending on the vehicle model. F-250s will have a 1-7/8" block and F-350s will have a 3-3/4" block. In both cases, replacing the factory block with the new provided block will net the same level stance regardless of vehicle model.

- 32. Block the front wheels for safety.
- 33. Raise the rear of the vehicle and support with jack stands under the frame rails just ahead of the spring hangers.
- 34. Remove the wheels.
- 35. Support the axle with a hydraulic jack.
- 36. Remove the factory shocks. Retain all mounting hardware.
- 37. Disconnect the passenger's side spring u-bolts. (Fig 11)

## FIGURE 11



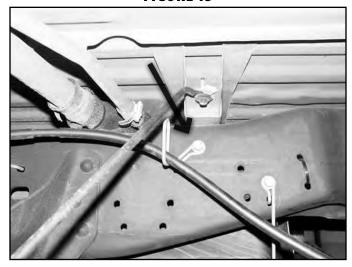
- 38. Remove the factory lift block. It will not be reused.
- 39. Lower the axle enough to place the provided 4" lift block between the axle and the leaf spring. Position the block so the bump stop wing faces inward.
- 40. Raise the axle to engage the block spring alignment pin. (Fig 12) Fasten the entire assembly with the provided u-bolts, high nuts and washers. Snug but do not torque the u-bolts at this time.



FIGURE 12

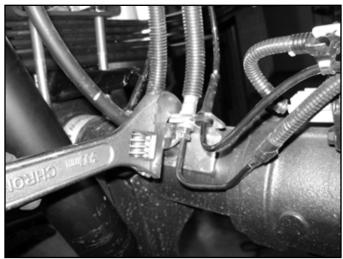
- 41. Repeat block installation of the driver's side. Take care not to over extend the brake lines.
- 42. If more parking brake cable slack is needed, remove the cable from the rear-most retaining bracket on the frame. (Fig 12)

## FIGURE 13



43. The brakelines may require additional slack. Located the factory bracket on the axle. Using an adjustable wrench, carefully bend the bracket so the fittings are positioned vertical to allow more slack. (Fig 14)

FIGURE 14



- 44. Install the new shocks with the original mounting hardware. Tighten to 55 ft-lbs.
- 45. Install wheels and lower the vehicle to the ground.
- 46. With the weight of the vehicle on the axle, torque the u-bolts to 130-150 ft-lbs.
- 47. Torque lug nuts to factory specification.
- 48. Recheck all hardware for proper torque, check again after 500 miles and at regularly scheduled maintenance intervals.