

## For Rancho Suspension System **RS6514 (B)**: Ford Super Duty

Requires coil spring kit RS80117 or RS80119 for a complete installation

*READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION*



### **IMPORTANT NOTES!**

**WARNING:** This suspension system will enhance the off-road performance of your vehicle. It will handle differently, both on and off-road, from a factory equipped passenger car or truck. Failure to drive this vehicle safely may result in serious injury or death to the driver and passengers. ALWAYS WEAR your seat belts, REDUCE your speed, and AVOID sharp turns and other abrupt maneuvers.

A. Before installing this system, have the vehicle's alignment and frame checked by a certified technician. The alignment must be within factory specifications and the frame of the vehicle must be sound (no cracks, damage or corrosion).

B. Do not install a body lift kit with this suspension system or interchange Rancho components with parts from another manufacturer.

C. Do not powdercoat or plate any of the components in this system. To change the appearance of components, automotive paint can be applied over the original coating.

D. Each hardware kit in this system contains fasteners of high strength and specific size. Do not mix hardware kits or substitute a fastener of lesser strength. See bolt identification table on page 2.

E. Compare the contents of this system with the parts list in these instructions. If any parts are missing, contact the Rancho Technical Department at 1-734-384-7804.

F. Install all nuts and bolts with a flat washer. When both SAE (small OD) and USS (large OD) washers are used in a fastener assembly, place the USS washer against the slotted hole and the SAE washer against the round hole.

G. Apply a drop of thread locking compound to all bolts during installation. CAUTION: Thread locking compound may irritate sensitive skin. Read warning label on container before use.

H. Unless otherwise specified, tighten all nuts and bolts to the standard torque specifications shown in the table on page 2. USE A TORQUE WRENCH for accurate measurements.

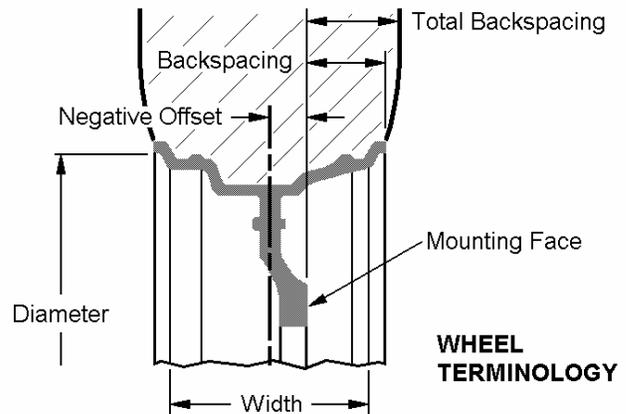
I. Some of the service procedures require the use of special tools designed for specific procedures. The following tools and supplies are recommended for proper installation of this system:

- Ford Service Manual
- Steering Arm Puller T64P-3590-F
- Torque Wrench (406 FT-LB capacity)
- 1/2" Drive Ratchet and Sockets
- 1/2" Drive Breaker Bar
- Combination Wrenches
- Heavy Duty Jack Stands
- Hydraulic Floor Jack (2)
- Wheel Chocks (wooden blocks)
- Center Punch
- Hammer
- Wire Brush (to clean bracket mounting surfaces)
- Tape Measure
- Safety Glasses--Wear safety glasses at all times

J. Suspension components that use rubber or urethane bushings should be tightened with the vehicle at normal ride height. This will prevent premature failure of the bushing and maintain ride comfort.

K. The required installation time for this system is approximately 5 to 6 hours. Check off the box (  ) at the beginning of each step when you finish it. Then when you stop during the installation, it will be easier to find where you need to continue from.

L. This suspension system was developed using a BFGoodrich® All-Terrain™ 37x12.5R17/D tire on a 17" wheel with 6.25" of backspacing. Before installing any other combination, consult your local tire and wheel specialist. Actual tire size varies by manufacturer.



M. Interference with the catalytic converter may prevent installation on 2008 Super Duty vehicles equipped with the 6.8L V10 engine.

N. Important information for the end user is contained in the consumer/installer information pack. If you are installing this system for someone else, place the information pack on the driver's seat. Please include the installation instructions when you finish.

O. Thank you for purchasing the best suspension system available. For the best installed system, follow these instructions. If you do not have the tools or are unsure of your abilities, have this system installed by a certified technician. RANCHO IS NOT RESPONSIBLE FOR DAMAGE OR FAILURE RESULTING FROM IMPROPER INSTALLATION OF THIS SUSPENSION SYSTEM.

STANDARD BOLT TORQUE & IDENTIFICATION						
INCH SYSTEM			METRIC SYSTEM			
Bolt Size	Grade 5	Grade 8	Bolt Size	Class 9.8	Class 10.9	Class 12.9
5/16	15 FT-LB	20 FT-LB	M6	5 FT-LB	9 FT-LB	12 FT-LB
3/8	30 FT-LB	35 FT-LB	M8	18 FT-LB	23 FT-LB	27 FT-LB
7/16	45 FT-LB	60 FT-LB	M10	32 FT-LB	45 FT-LB	50 FT-LB
1/2	65 FT-LB	90 FT-LB	M12	55 FT-LB	75 FT-LB	90 FT-LB
9/16	95 FT-LB	130 FT-LB	M14	85 FT-LB	120 FT-LB	145 FT-LB
5/8	135 FT-LB	175 FT-LB	M16	130 FT-LB	165FT-LB	210 FT-LB
3/4	185 FT-LB	280 FT-LB	M18	170 FT-LB	240FT-LB	290 FT-LB

<p><b>1/2-13x1.75 HHCS</b></p> <p>D T L X</p> <p>G = Grade Marking (bolt strength) D = Nominal Diameter (inches) T = Thread Pitch (threads per inch)</p>	<p>Grade 5 Grade 8</p> <p>L = Length (inches) X = Description (hex head cap screw)</p>	<p><b>M12-1.25x50 HHCS</b></p> <p>D T L X</p> <p>P = Property Class (bolt strength) D = Nominal Diameter (millimeters) T = Thread Pitch (thread width, mm)</p>	<p>L = Length (millimeters) X = Description (hex head cap screw)</p>
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## PARTS LIST

<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
	<b>Box 1 of 3</b>				
176323	Left Radius Arm	1		Cotter Pin	1
176324	Right Radius Arm	1	860578	Thread Lock	2
176325	Bump Stop Spacer	2		Hardware Kit	1
176420	Brake Line Bracket	2		Bushing	4
860516	Hardware Kit	1		Sleeve	4
	M8-1.25 x 25 HHCS	2		Washer	8
	M8-1.25 Nyloc Nut	2		M8-1.25 x 130 HHCS	2
	8mm Washer	4		M8-1.25 Nyloc Nut	2
	Thread Lock	2		M18-2.5 Nyloc Nut	1
	Tie Wrap	6		5/16 USS Washer	2
94180	Information Pack	1		5/16 SAE Washer	2
780281	Rancho Decal	1	176223	<b>Box 3 of 3</b>	
88514	Instructions	1	740021	Carrier Bearing Spacer	1
94119	Consumer/Warranty Information	1	860244	5/8-18 x 3.62 x 14.75 U-bolt	4
94177	Warning Sticker	1	15102	Winged Riser Block Kit	1
	<b>Box 2 of 3</b>		15103	Left Riser Block	1
176005	Sway Bar End Link	2	860449	Right Riser Block	1
176499B	Track Bar Bracket	1		Hardware Kit	1
7790	Pitman Arm	1		5/8-18 Nyloc Nut	8
860517	Hardware Kit	1	860482	5/8 Washer	8
	M14-2.0 x 80 HHCS	3		Hardware Kit	1
	M14-2.0 Stover Nut	3		Sleeve	2
	M14 Washer	6		7/16-14 x 3.5 HHCS	2
				7/16 SAE Washer	2

## FRONT SUSPENSION

### Vehicle Preparation

1.  Park the vehicle on a level surface. Set the parking brake and chock rear wheels.
2.  Disconnect the trackbar from the driver side frame bracket. See illustration 1.

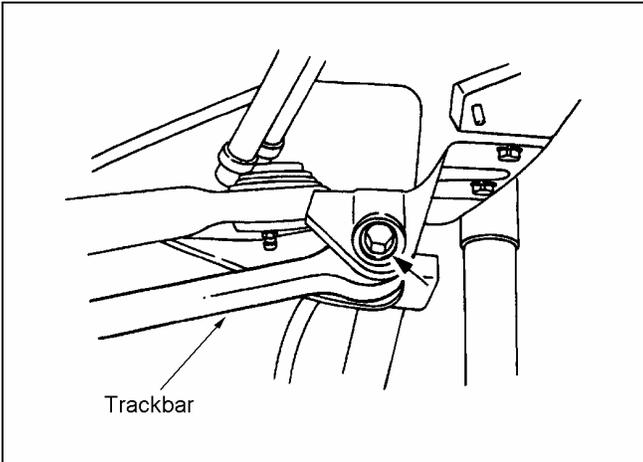


Illustration 1

3.  Disconnect the sway bar end links from the sway bar and axle bracket. See illustration 2. Remove end links.

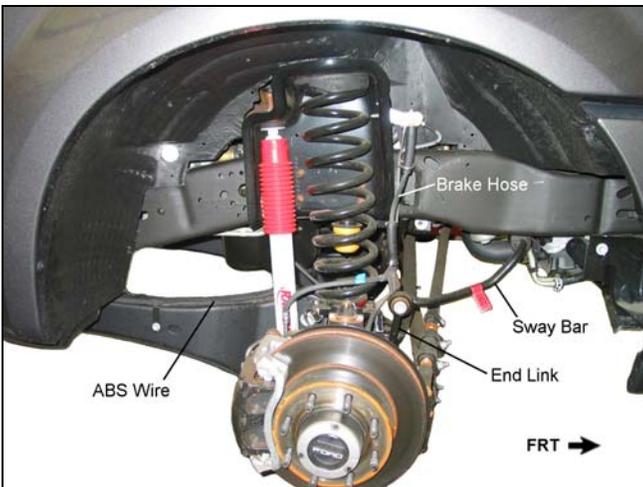


Illustration 2

4.  Raise the front of the vehicle and support the frame with jack stands. Remove front wheels and set them aside.
5.  Remove bump stop from cup shaped bracket. Remove bracket from frame rail.
6.  Separate the brake hose brackets from the frame rail.
7.  Disconnect the ABS sensor wire from the lower spring seat and the radius arm.

8.  If equipped with auto hubs, disconnect the vacuum hose from the axle hub and frame.

9.  Repeat steps 5 through 8 for the other side.

### Radius Arm Removal & Installation

1.  Support the front axle with two floor jacks, one under each coil spring.

2.  Remove the front shock absorbers. Carefully lower the axle enough to relieve the tension on the coil springs.

**CAUTION:** Do not allow the front axle to hang from any cables, lines or hoses.

3.  Using a ratchet and deep socket remove the bolt that holds the lower spring seat to the axle. See illustration 3. Remove the coil spring and lower seat as an assembly. Repeat for other side.



Illustration 3

4.  Support both radius arms with jack stands. Remove the rear mounting bolts and lower the radius arms out of the frame brackets.

**CAUTION:** Always support at least one radius arm with a jack stand to keep the axle from rotating downward.

5.  Remove the driver side radius arm from the front axle.

6.  Loosely attach left radius arm 176323 to the front axle on the driver side. Use the original hardware and the 18mm nut from kit 860514. See illustration 4.

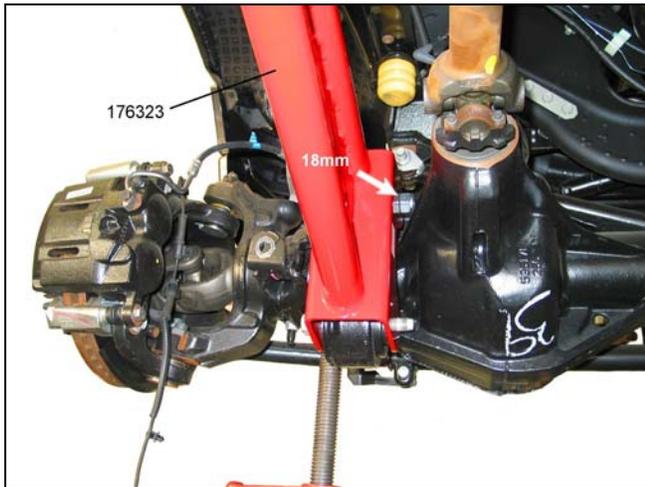


Illustration 4

7.  Loosely attach the right radius arm 176324 to the front axle on the passenger side. Use the original hardware.
8.  Lift radius arms into frame brackets. Install the original bolts and nuts. Do not tighten until vehicle is at normal ride height.

### Coil Spring Installation

1.  Install original rubber washer on top of coil spring 696(diesel) or 698(gas). Align pigtail and install lower spring seat on bottom of coil spring.

NOTE: Coil springs are not included with this kit and must be purchased separately.

2.  Insert coil spring assembly into upper bracket and onto front axle. Reattach lower spring seat.
3.  Repeat steps 1 and 2 for the other side.
4.  Carefully raise axle until springs are snug. Install new front shock absorbers.

**CAUTION:** Do not lift the vehicle off of jack stands.

5.  Reattach the brake lower line brackets to the lower spring seats. If applicable, reconnect the vacuum hose to the axle hub.

NOTE: Readjust vacuum hose clips as necessary.

6.  Reconnect the ABS wires to the lower spring seat. Attach wires to radius arms with tie wraps. See illustration 5.

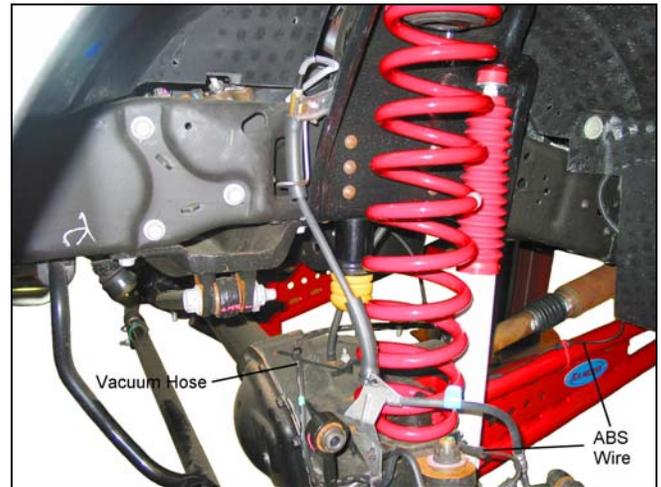


Illustration 5

### Brake Hose Drop Bracket installation

1.  Attach brake hose to drop bracket 176420 with the hardware from kit 860516. See illustration 6.



Illustration 6

2.  Using the original bolt and location, attach brake hose drop bracket 176420 to the frame rail. Tighten nuts and bolts securely.
3.  Repeat for other side.

### Bump Stop Spacer & End Link Installation

1.  Insert spacer 176325 between frame rail and bracket. See illustration 7. Align tab on bracket with hole in spacer. Using the 8 mm bolt and smaller washer from kit 860578, attach bump stop bracket to spacer and frame rail. Tighten bolt.
2.  Install the larger washer and 8mm nut on top. Tighten nut.

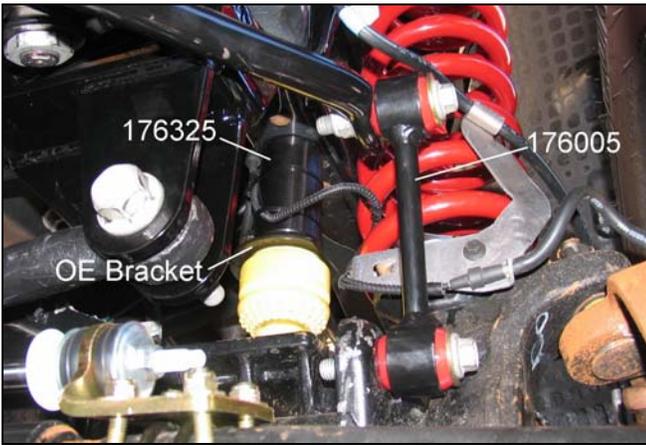


Illustration 7

3.  Insert bump stop into bracket.
4.  Apply silicone spray or a mild solution of soap and water to a bushing and sleeve from kit 860578. Press bushing then sleeve into new sway bar end link 176005. See illustration 8. Repeat for other end.

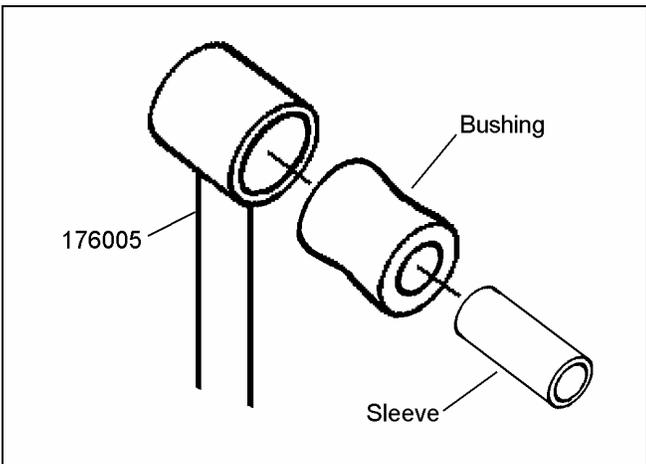


Illustration 8

5.  Using the washers from kit 860578, attach new end link assembly to the sway bar and axle bracket with the original bolts. Refer back to illustration 7. Tighten nuts and bolts to specifications.
6.  Repeat steps 1 through 5 for the other side.

### Track bar Bracket & Pitman Arm Replacement

1.  Remove the two mounting bolts holding the track bar bracket to the driver side frame rail. See illustration 9.
2.  Remove the nuts and bolts attaching the track bar bracket to the crossmember. See illustration 10. Remove the track bar bracket.

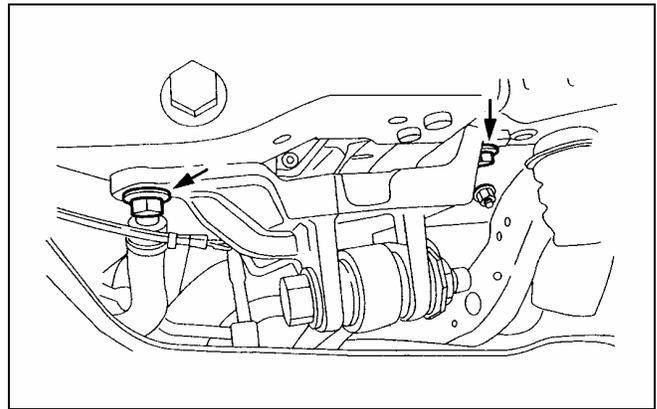


Illustration 9

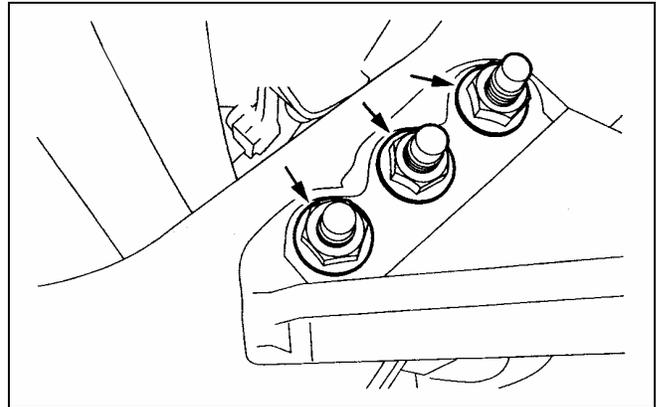


Illustration 10

3.  Center the steering wheel and secure. Remove the cotter pin and castellated nut from the drag link ball stud at the pitman arm.
4.  Using steering arm puller T64P-3590-F, separate the pitman arm from the drag link. See illustration 11.

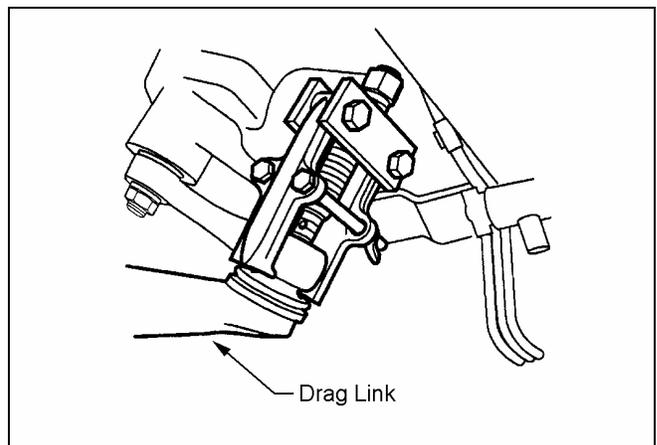


Illustration 11

5.  Remove the nut from the steering gear sector shaft. Remove the pitman arm using steering arm puller T64P-3590-F.

## REAR SUSPENSION

6.  Install new pitman arm RS7790 on the sector shaft in the same position as the original arm. See illustration 12. Apply thread lock and tighten the sector shaft nut to 350 ft.-lbs.

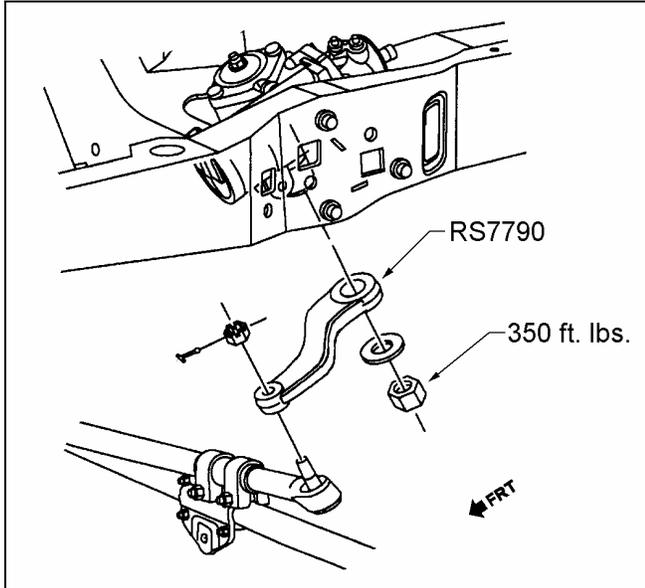


Illustration 12

7.  Attach the drag link to the new pitman arm. Tighten the castellated nut to 148 ft. lbs. and install a new cotter pin.
8.  Attach new track bar bracket RS176449B to the frame with the original bolts and to the crossmember with the hardware from kit RS860517. See illustration 13. Tighten the nuts and bolts to 129 ft. lbs.

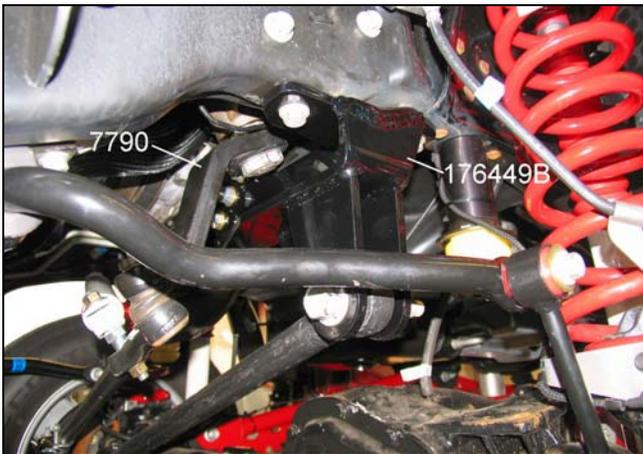


Illustration 13

9.  Install front wheels and lower the vehicle to the ground. Tighten lug nuts to 165 ft. lbs.
10.  Attach track bar to bracket RS176449B with the original hardware. Tighten bolt to 406 ft. lbs.
11.  Tighten radius arm bolts to 222 ft. lbs.

1.  Chock front wheels. Raise the rear of the vehicle and support the frame with jack stands. Remove rear wheels and set them aside.

2.  Support the rear axle assembly with a hydraulic jack. Remove both rear shock absorbers. **Do not reuse OE shock absorbers.**

3.  Remove the U-bolt retaining nuts on the passenger side of the vehicle only. See illustration 14. Remove the U-bolts.

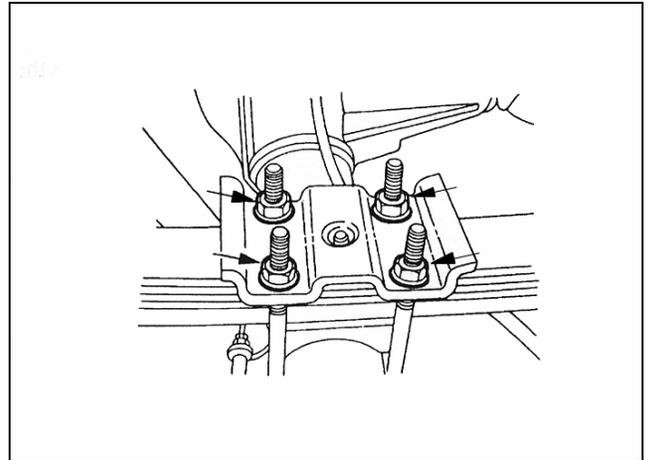


Illustration 14

4.  Carefully lower the rear axle and remove the OE riser block.

5.  Install riser block 15103 on axle pad. See illustration 15.

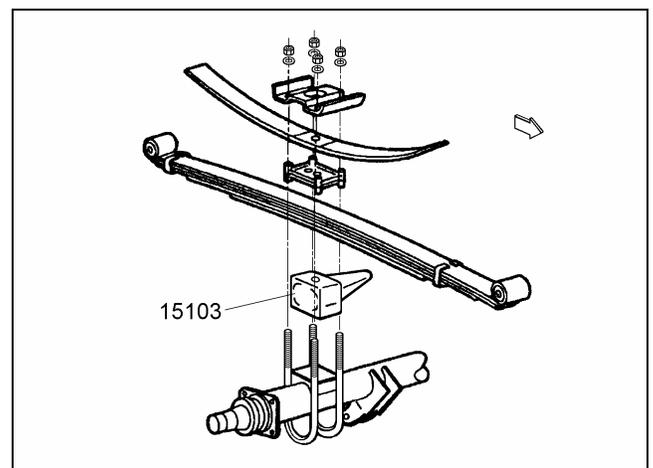


Illustration 15

6.  Carefully raise the rear axle until the riser block makes contact with the leaf spring. Align pin on bottom of spring with hole in block.

7.  Attach the axle to the spring with new U-bolts (740021) and the hardware from kit 860449. Tighten the nuts evenly in a cross-type pattern to 148 ft. lbs.
8.  Repeat steps 3 through 7 to install riser block 15102 on the driver side.
9.  Install new Rancho rear shock absorbers.
10.  For vehicles with a two-piece driveshaft, support the driveshaft and remove the bolts from the carrier-bearing bracket. See illustration 16.

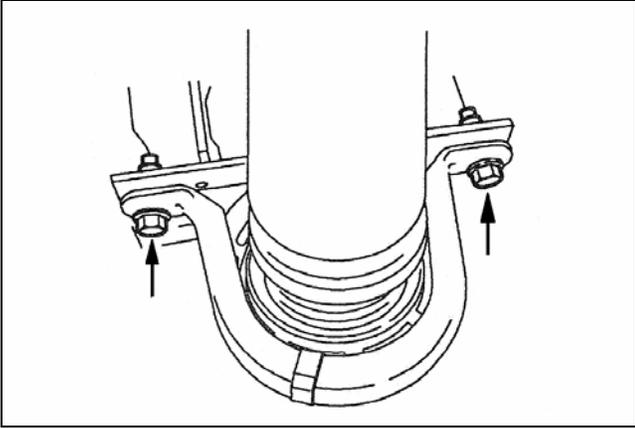


Illustration 16

11.  Insert carrier-bearing spacer 176223 between the bearing bracket and body mount. See illustration 17.



Illustration 17

12.  Place the two sleeves from kit 860482 inside the bearing spacer over the mounting holes.
13.  Reattach the carrier-bearing bracket with the hardware from kit 860482. Tighten the bolts to 47 ft. lbs.
14.  Install rear wheels and lower vehicle to the ground. Tighten lug nuts to 165 ft. lbs.

## FINAL CHECKS & ADJUSTMENTS

1.  Turn the front wheels completely left then right. Verify adequate tire, wheel, and brake hose clearance. Inspect steering and suspension for tightness and proper operation.
2.  Ensure that the vehicle brake system operates correctly. If new brake hoses were installed, verify that each hose allows for full suspension movement.
3.  Readjust headlamps. Have vehicle Aligned at a certified alignment facility.

**Please retain this publication for future reference. See Important Note N.**

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