

For Rancho Suspension Systems **RS6518**: 2009 FORD F-150 4WD

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. New Rancho shock absorbers are required and must be purchased separately.

Front: RS999806

Rear: RS999287, RS5287 or RS19287.

C. Do not powder-coat 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
- ☐ Die Grinder with cut-off blade or sawzall
- ☐ Vacuum Cap
- ☐ Coil Spring Compressor
- ☐ Torque Wrench (406 FT-LB capacity)
- ☐ Ford Ball Joint Tool- part number- 204-592
- ☐ 1/2" Drive Ratchet and Sockets
- ☐ Assorted Combination Wrenches
- ☐ Heavy Duty Jack Stands
- ☐ Wheel Chocks (wooden blocks)
- ☐ Hydraulic Floor Jack
- ☐ File
- ☐ Hammer
- ☐ Wire Brush (to clean bracket mounting surfaces)
- ☐ Black Enamel Paint
- ☐ Silicone Spray Lubricant
- ☐ Tape Measure
- ☐ **Safety Glasses** (wear safety glasses at all times)

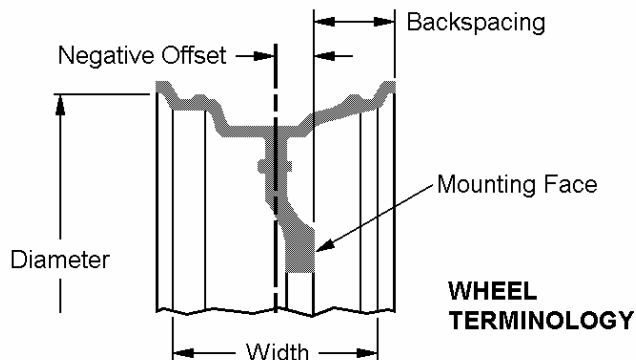
J. It is extremely important to replace coil springs, CV flanges, and front drive shaft/pinion relationships as original. Be sure to mark left/right, front/rear, and indexing of mating parts before disassembly. A paint marker or light colored nail polish is handy for this.

K. 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.

L. 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.

M. This suspension system was developed using the following tire & wheel combination: 35 x 12.5 x 18LT tire, 18 x

9 wheel with 4.5 inches of wheel backspacing. Before installing any other combination, consult your local tire and wheel specialist. OE wheels 18" and larger will fit with this suspension system.

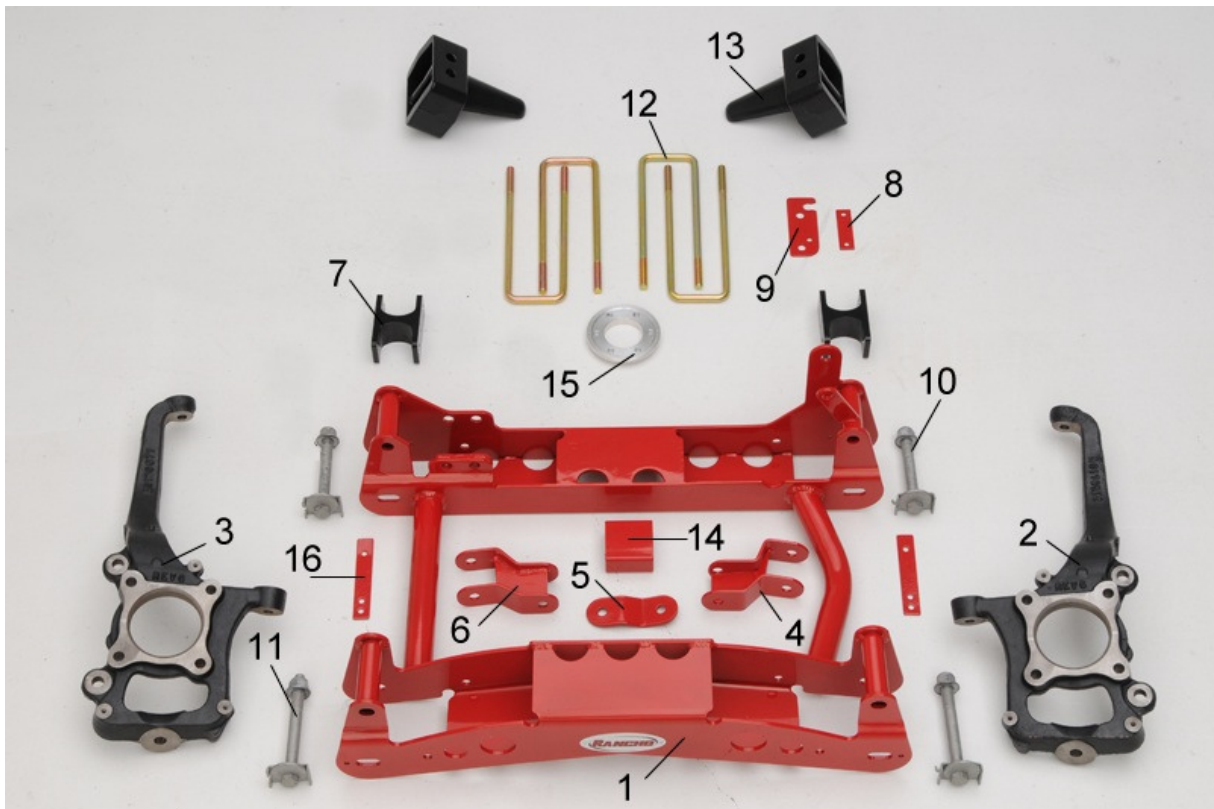


N. Important information for the end user is contained in the consumer/installer information pack. If you are installing this system for someone else, place the information pack on the driver's seat. Please include the installation instructions when you finish.

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 SUSPENSION IS NOT RESPONSIBLE FOR DAMAGE OR FAILURE RESULTING FROM AN IMPROPER OR MODIFIED INSTALLATION...

P. Red Components are for illustration purposes only. Red components might not be available.

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
1/2-13x1.75 HHCS D T L X G = Grade Marking (bolt strength) D = Nominal Diameter (inches) T = Thread Pitch (threads per inch)			M12-1.25x50 HHCS D T L X P = Property Class (bolt strength) D = Nominal Diameter (millimeters) T = Thread Pitch (thread width, mm)			



PARTS LIST

<u>Item</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY</u>	<u>Item</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY</u>
1	176575	Subframe	1			M8 Washer	4
2	176576	Knuckle, Left	1			M8-1.25 Nylock Nut	2
3	176577	Knuckle, Right	1		860667	Alignment Hardware Kit	1
4	176580	Differential Drop Bracket, Left	1	10	176311	M18-2.5 x 150 Cam Bolt	2
5	176582	Differential Rear Support Bracket	1	11	176578	M18-2.5 x 160 Cam Bolt	2
6	176581	Differential Drop Bracket, Right	1		176584	Alignment Cam Bracket	4
7	176579	Sway Bar Drop Bracket	2			M18 Washer	4
	860506	Sway Bar Hardware Kit	2			M18-2.5 Nylock Nut	4
		M10-1.50 x 30 HHCS	4		860668	Driveshaft Hardware Kit	1
		M10 Washer	8			M10-1.5 x 80	6
		M10-1.50 Nylock Nut	4			M10 Washer	6
	860665	Rear Sub Assembly Kit	1			M12-1.75 x 130	2
8	176314	Rear Brake Hose Drop Bracket	1			½ USS Washer	4
9	176583	E-Brake Cable Drop Bracket	1			M12-1.75 Nylock Nut	2
		M12-1.75 x 30 HHCS	1			Thread Lock	2
		M12 Washer	2	12	740017	U-bolt	4
		M12-1.75 Nylock Nut	1		860152	U-bolt Hardware Kit	1
		M8-1.25 x 10 HHCS	1			9/16-18 Washer	8
		M8-1.25 x 20 HHCS	1			9-16-18 Nylock Nut	8
		M8 Washers	2	13	15104	Riser Block	2
		M8-1.25 Nylock Nut	2	14	176585	Crossmember Crush Spacer	1
	860666	Differential Drop Hardware Kit	1	15	176586	Front Driveshaft Spacer	1
		M14-2.0 x 90 HHCS	2	16	176587	Brake Hose Drop Bracket	1
		M14-2.0 x 40 HHCS	1		94180	Information Pack	1
		M14-2.0 x 100 HHCS	1		780281	Rancho Decal	1
		M14 Washer	8		88508	Installation Instruction	1
		M14-2.0 Top Lock	4		94119	Consumer/Warranty Information	1
		M8-1.25 x 20	2		94177	Warning Sticker	1

FRONT SUSPENSION

VEHICLE PREPARATION & SWAY BAR REMOVAL

- 1) ☐ Park the vehicle on a level surface. Set the parking brake and chock rear wheels. Measure and record the distance from the center of each wheel to the top of the fender opening. See illustration 1.

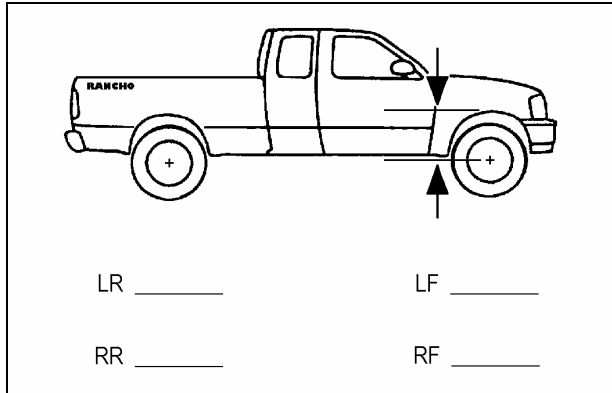


Illustration 1

- 2) ☐ Raise the front of the vehicle and support the frame with jackstands. Remove the front wheels and set them aside.
- 3) ☐ If applicable, remove the front skid plate.
- 4) ☐ Hold the hex stud and remove the nut attaching the sway bar end link to the lower control arm. See illustration 2. Repeat for other side.

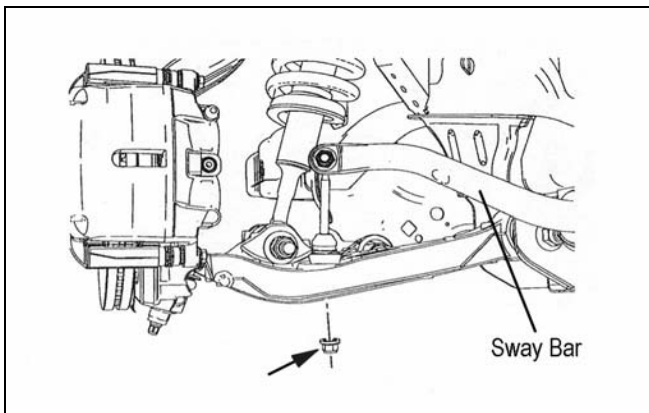


Illustration 2

- 5) ☐ Remove the four nuts holding the sway bar to the frame. Remove the sway bar assembly.
- 6) ☐ Loosen lower control arm pivot bolts.

STEERING KNUCKLE & SHOCK REMOVAL

- 1) ☐ Separate the ABS sensor line from the brake hose. Remove the brake caliper anchor bolts (illustration 3). Remove the brake caliper and its mounting bracket as an assembly. Hang the caliper assembly with wire or a tie wrap.

CAUTION: Do not allow the caliper to hang by the brake hose.

- 2) ☐ Label the brake rotor left or right. Remove the brake rotor.
- 3) ☐ Disconnect the ABS sensor and vacuum line from the wheel hub. Remove the axle cap and nut. Remove the dust shield. See illustration 3.

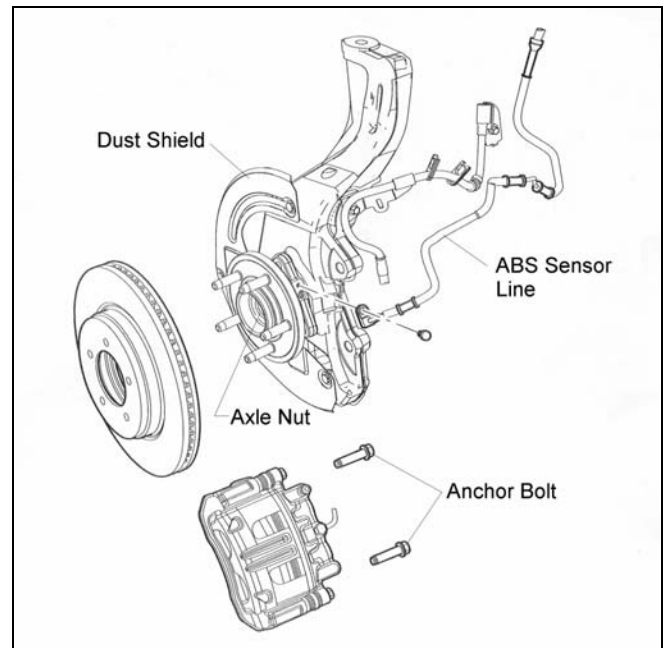


Illustration 3

CAUTION: Do not hammer the ball studs to separate them from components

- 4) ☐ Remove the nut from the outer tie rod stud. Using Ford Service tool #204-592 separate tie rod stud from knuckle.
- 5) ☐ Loosen the nuts at the upper and lower ball joints. Using Ford Service tool #204-592 separate ball joints from knuckle.
- 6) ☐ Remove the shock absorber lower arm nut and bolt.

- 7) ☐ Remove the upper and lower ball joint nuts. Carefully remove the steering knuckle. Cover the exposed hub to prevent contamination.
- 8) ☐ Remove the three shock absorber upper mount to frame nuts. Remove the shock absorber and spring assembly. See illustration 4.

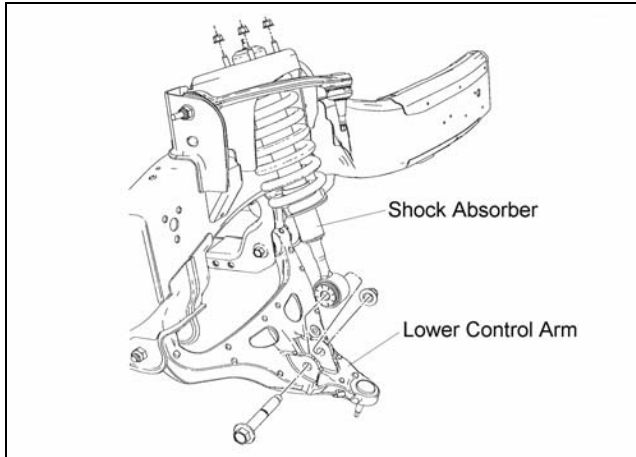


Illustration 4

- 9) ☐ Repeat for other side.

FRONT DIFFERENTIAL REMOVAL

- 1) ☐ Remove the lower control arm pivot bolts. Remove the lower control arm.
- 2) ☐ Repeat steps for the other side.
- 3) ☐ Remove the four bolts that attach the crossmember to the lower control arm pockets. Remove the crossmember. See illustration 5.

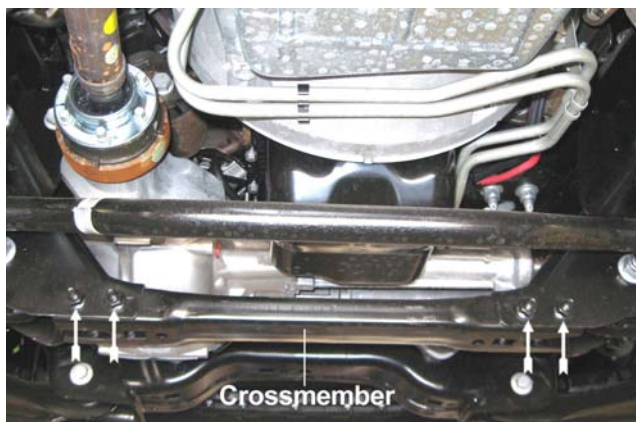


Illustration 5

- 4) ☐ Index-mark the front driveshaft flange to the front differential pinion flange. Refer to illustration 12.

- 5) ☐ Remove the six bolts from the driveshaft flange. Disconnect and support the front driveshaft.
- 6) ☐ Disconnect the vent hose from the axle housing. Support the front differential assembly with a floor jack.
- 7) ☐ Remove the front differential assembly lower mounting bolt. See illustration 6.
- 8) ☐ Remove the right axle housing bolt, then pushing up on the right side of the differential, remove the upper carrier bolt. Remove the differential assembly from the vehicle.

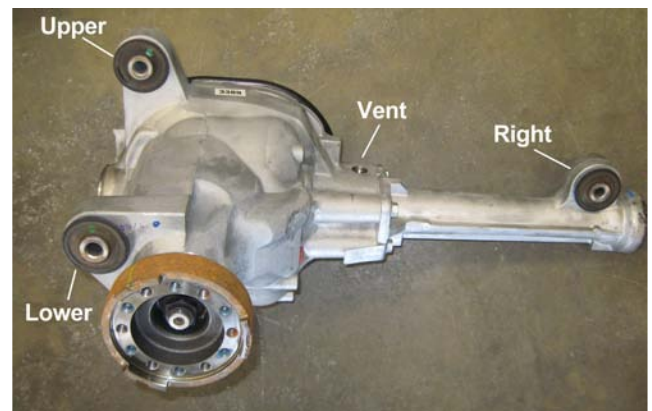


Illustration 6

FRONT DIFFERENTIAL & SUBFRAME INSTALLATION

- 1) ☐ Draw a line, perpendicular to the bottom edge and 1/2" from the edge of the slotted hole, on the front and back of the driver side crossmember bracket. Connect the lines on the top of the bracket providing a minimum of 7" clearance. See illustration 7.

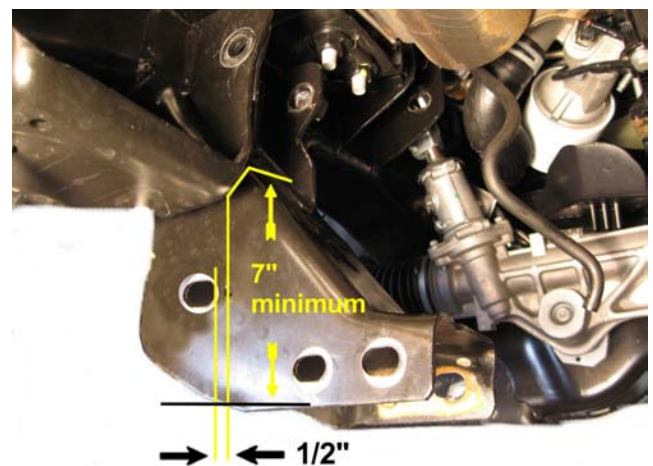


Illustration 7

2) ☐ Using a die grinder / sawzall follow the line and cut off the crossmember bracket rounding off any sharp corners. Paint bare metal to prevent rust. See illustration 8.

CAUTION: Do not use a flame cutter or torch to remove bracket.

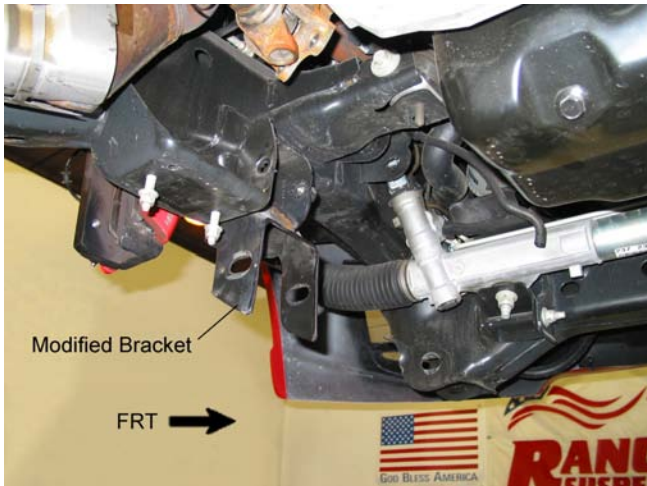


Illustration 8

3) ☐ Loosely attach left drop bracket 176580 to the front differential upper frame bracket with the original hardware. See illustration 9.



Illustration 9

NOTE: Differential drop brackets have an L & R laser cut into the metal for identification.

4) ☐ Loosely attach right drop bracket 176581 to the right frame bracket with the original hardware. See illustration 9.

5) ☐ With the help of an assistant, carefully raise the front differential assembly up into the left and right drop brackets. Loosely attach the differential

assembly to the brackets with the hardware from kit 860666 and reattach vent hose.

6) ☐ With the help of an assistant, raise subframe 176575 into the lower control arm frame brackets. Attach subframe to the lower control arm brackets with original hardware.

7) ☐ Using 12mm hardware from kit 860668 loosely attach crossmember crush spacer 176585 to subframe. See illustration 10.



Illustration 10

CAUTION: With subframe in place, verify that the differential lower mount does not contact the modified frame bracket. There must be a minimum of 1/4" clearance between frame and differential. Contact may cause vibration.



Illustration 11

8) ☐ Attach lower differential mount to support bracket 176582 and subframe with 14mm hardware from kit 860666. Refer to illustration 11.

9) ☐ Tighten the following bolts in order: Subframe 176575 to frame bolts to 222 ft lbs; the differential lower mounting bolt to 85 ft lbs; lower differential support bracket to 85 ft. lbs.; the differential drop bracket bolts to 85 ft. lbs. and the right crossmember bolts to 75 ft lbs.

10) ☐ Align index marks on front driveshaft, insert spacer 176586 between driveshaft and pinion flange. Secure together with 10mm hardware from kit 860668 using OE torque plates. Tighten bolts to 41 ft lbs. See illustration 12. Use of blue thread lock is recommended but not included.

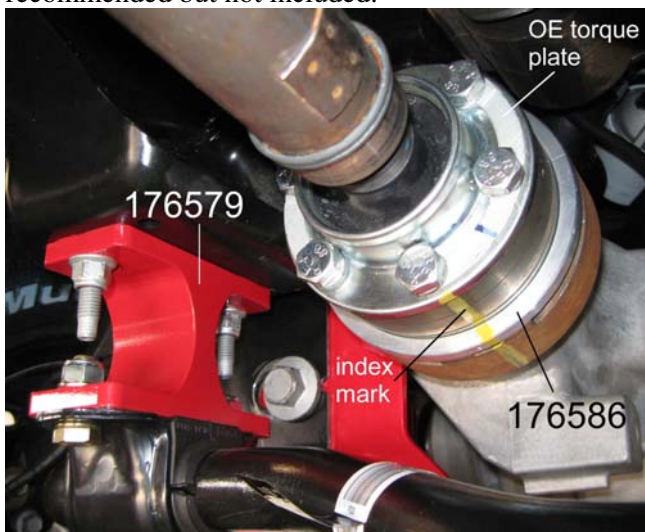


Illustration 12

SHOCK ABSORBER REPLACEMENT

NOTE: New shock absorbers are not included with this kit and must be purchased separately. See Important Note B.

- 1) ☐ Index-mark the shock absorber upper mount and coil spring with the lower mount.
- 2) ☐ Using a quality spring compressor, compress the coil spring until the tension is released from the shock absorber
- 3) ☐ Hold the hex stud and remove the upper mounting nut. Slide the shock absorber out of the spring assembly.

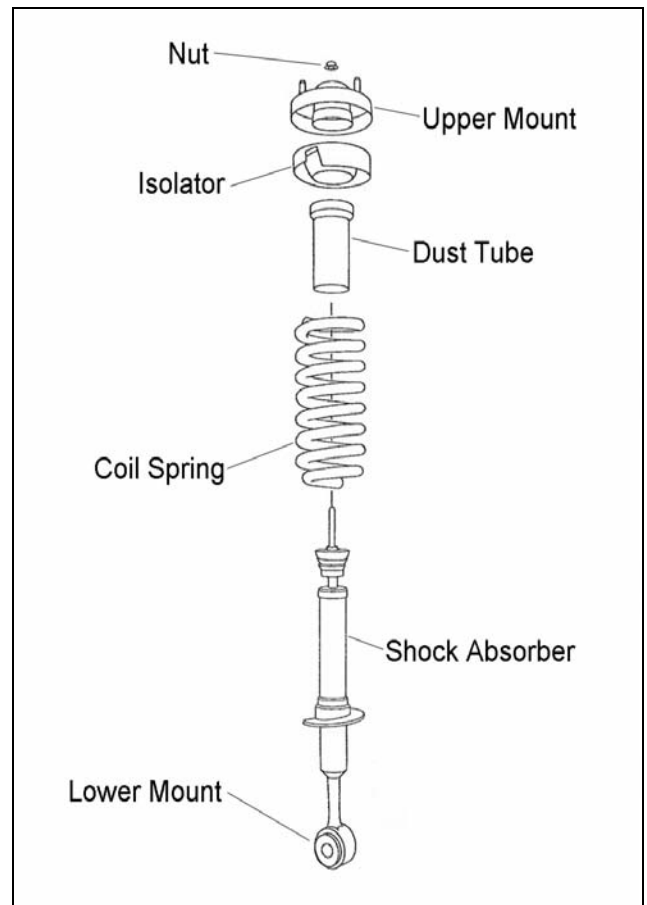


Illustration 13

4) ☐ Insert new Rancho shock absorber. Align the index marks and install with included flanged nut. Tighten the nut to 41 ft. lbs.

5) ☐ Remove the spring compressor.

SHOCK ABSORBER INSTALLATION

1) ☐ Loosely attach the driver side lower control arm to the subframe with the hardware from kit 860667. Insert front alignment cam bolt / bracket 176578 in from front to rear aligning bracket with hole in subframe and rear cam bolt / bracket 176311 in from rear to front.

NOTE: Do not tighten the lower control arm bolts until the vehicle is at normal ride height.

2) ☐ Insert the new Rancho shock absorber and spring assembly into the upper frame mount. Install the original nuts tighten to 30 ft. lbs. Refer back to illustration 4.

3) ☐ Loosely attach the shock absorber to the lower control arm with the original hardware. See illustration 14.



Illustration 14

- 4) ☐ Repeat steps 1 through 3 for the passenger side.

STEERING KNUCKLE INSTALLATION

- 1) ☐ Remove the integrated wheel end and wheel hub from the passenger side steering knuckle. See illustration 15.

CAUTION: Do not damage the O-ring on the wheel hub.

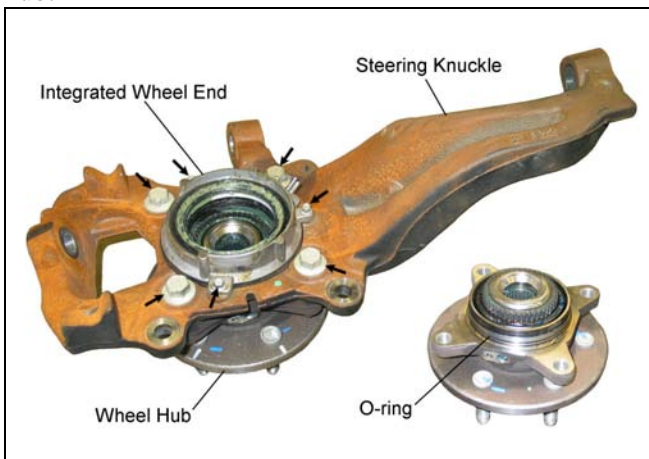


Illustration 15

- 2) ☐ Align the ABS sensor hole and attach the wheel hub to right Rancho knuckle 176577 with the original bolts. Tighten the bolts to 129 ft. lbs.
- 3) ☐ Compress the integrated wheel end and install a vacuum cap on the fitting to keep it compressed. See illustration 16.

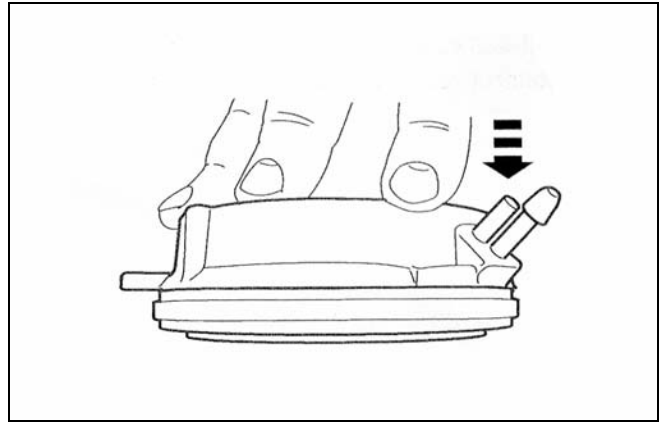


Illustration 16

- 4) ☐ Install the integrated wheel end on the axle shaft. Do not install on the steering knuckle.
- 5) ☐ Carefully insert the axle into the hub and attach the passenger side lower and upper ball joints to steering knuckle 176577. Tighten the lower ball joint stud nut to 111 ft. lbs and the upper nut to 85 ft. lbs.
- 6) ☐ Align vacuum port upward and attach the integrated wheel end to the knuckle with the original hardware. Tighten the bolts to 11 ft lbs.
- 7) ☐ Install the axle halfshaft nut. Tighten the nut to 20 ft. lbs. Install the axle cap.
- 8) ☐ Loosen the jam nut on the tie rod and thread the tie rod end out approximately 3 turns. Insert the tie rod end from the top into the steering knuckle and install the original nut. Tighten the ball stud nut to 85 ft. lbs and the jam nut to 76 ft. lbs.
- 9) ☐ Attach the dust shield with the original hardware. Tighten the bolts to 12 ft. lbs.
- 10) ☐ Repeat steps 1 through 9 for the driver side.

CALIPER AND BRAKE HOSE DROP BRACKETS

- 1) ☐ Disconnect the retaining clips and lengthen the ABS and vacuum lines if applicable. Reattach the ABS sensor line to the wheel hub and the vacuum hose to the integrated wheel end.
- 2) ☐ Disconnect the passenger side brake line bracket from the frame. Install the right brake rotor on the passenger side wheel hub.
- 3) ☐ Install the brake caliper over the rotor. Attach the caliper to the knuckle with the original anchor bolts. Tighten the bolts to 136 ft. lbs.

- 4) ☐ Using the original bolt and location, attach brake hose drop bracket 176587 to the frame rail. Tighten bolt securely.
- 5) ☐ Attach brake hose to drop bracket 176587 with hardware from kit 860666. See illustration 17.



Illustration 17

- 6) ☐ Repeat for other side.

SWAY BAR INSTALLATION

- 1) ☐ Attach sway bar drop brackets 176579 to the frame with the original hardware. Tighten the nuts to 35 ft. lbs.
- 2) ☐ Attach the sway bar to the drop brackets with hardware from kit 860506 torque to 45 ft. lbs. See illustration 12.
- 3) ☐ Attach the sway bar end links to the lower control arms. Tighten the nuts to 59 ft. lbs.
- 4) ☐ Install front wheels and lower vehicle to ground. Tighten the lug nuts to 150 ft. lbs.
- 5) ☐ Align the cam bolts in the center and tighten the lower control arm pivot nuts to 258 ft. lbs. Tighten the lower shock nut and bolt to 406 ft. lbs.

REAR SUSPENSION

CABLE & HOSE BRACKET INSTALLATION

- 1) ☐ Chock front wheels. Raise the rear of the vehicle and support the frame with jack stands. Remove the rear wheels.

- 2) ☐ On the driver side, separate the left parking brake cable from the right cable at the union. See illustration 18.

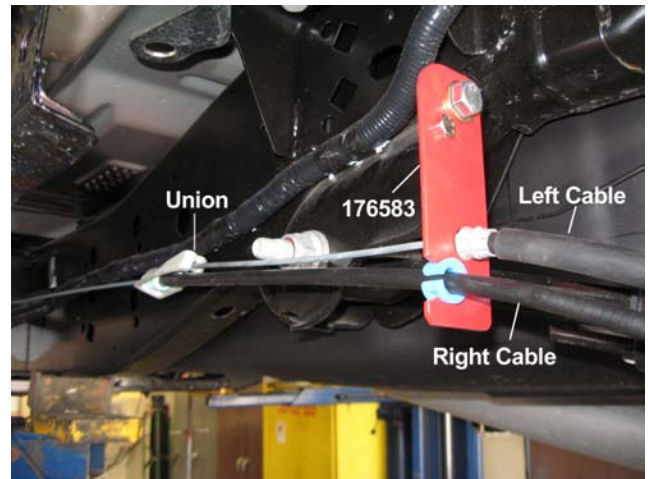


Illustration 18

- 3) ☐ Compress the retainer and remove the left and right cables from the frame bracket.
- 4) ☐ Attach e-brake cable drop bracket 176583 to the frame with the 12mm and 8mm hardware from kit 860665. Do not use washers for 8mm anti-rotation bolt. See illustration 18.
- 5) ☐ Insert the left brake cable through bracket 176583. Attach right cable to bracket as shown with original retainer. Reattach the left brake cable to the right at the union.
- 6) ☐ Remove the brake hose bracket from the inside of the driver side frame rail.
- 7) ☐ Attach drop bracket 176314 to the frame with the original bolt. Tighten the bolt to 12 ft. lbs. See illustration 19.
- 8) ☐ Attach the original brake hose bracket to drop bracket 176314 with the 8mm hardware from kit 860665.

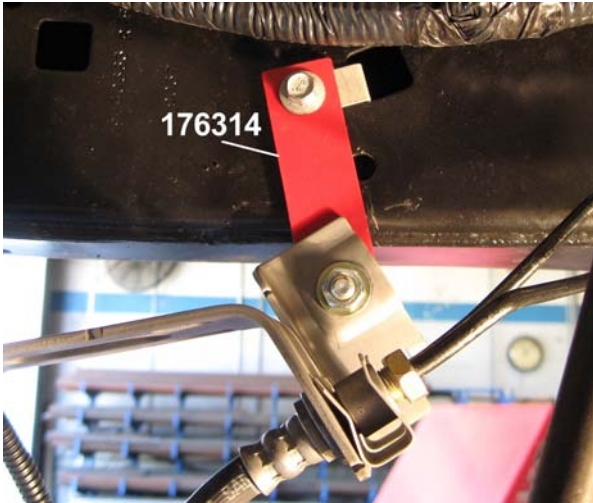


Illustration 19

RISER BLOCK INSTALLATION

- 1) ☐ Support the rear axle assembly with a floor jack.
- 2) ☐ Remove both rear shock absorbers. Do not reuse OEM shock absorbers.
- 3) ☐ Loosen the U-bolt nuts on both sides of the vehicle.
- 4) ☐ Remove the passenger side U-bolts only. Carefully lower the rear axle and remove the original riser block.

CAUTION: Do not allow the axle to hang by any hoses or ABS cables.

- 5) ☐ Place riser block 15104 on the axle pad as shown in illustration 20. Loosely attach the leaf spring to the axle with U-bolts (740017) and the hardware from kit 860152.
- 6) ☐ Repeat steps 4 and 5 for the driver side.
- 7) ☐ Cross tighten all U-bolt nuts evenly to 85 ft. lbs.

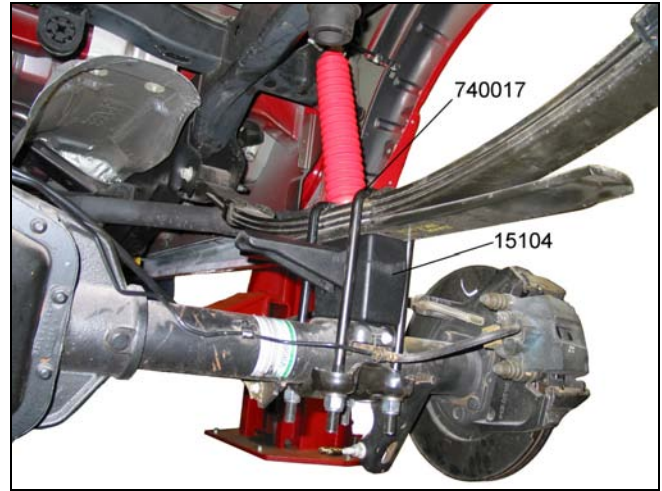


Illustration 20

8) ☐ Install new Rancho shock absorbers. Refer back to Important Note B.

9) ☐ Install rear wheels and lower vehicle to ground. Tighten lug nuts to 150 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) ☐ With the suspension at maximum extension (full droop), inspect and rotate all axles and drive shafts. Check for binding and proper slip yoke insertion. The slip yoke should be inserted a minimum of one inch into the transfer case and/or transmission.
- 3) ☐ Ensure that the vehicle brake system operates correctly.
- 4) ☐ Readjust headlamps. Have vehicle Aligned at a certified alignment facility.

Recommended Alignment Specifications
 Caster (degrees): LH $3.8^{\circ} \pm 1.0^{\circ}$ / RH $4.2^{\circ} \pm 1.0^{\circ}$
 Camber (degrees): $0^{\circ} - .3^{\circ}$
 Sum Toe In (inches): $.20 \pm .10$

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

NOTES:
