

INSTALLATION INSTRUCTION

88587

Rev A

FOR RANCHO SUSPENSION SYSTEM **RS6587B**: 2009 DODGE RAM 1500

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: RS5810 / **Rear:** RS5369

C. Do not powder coat, chrome, cadmium, or zinc plate any of the components in this system. Doing so will render the warranty null and void. To change the appearance of components, enamel 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 below. 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: ☒

- ☐ Dodge Service Manual
- ☐ Coil Spring Compressor
- ☐ Removing Tools 8677 & 9360
- ☐ Drill motor
- ☐ Reciprocating saw
- ☐ Assorted Drills: 1/8" through 1/2"
- ☐ Torque Wrench (250 FT-LB capacity)
- ☐ 1/2" Drive Ratchet and Sockets
- ☐ Assorted Combination Wrenches
- ☐ Heavy Duty Jack Stands
- ☐ Wheel Chocks (wooden blocks)
- ☐ Hydraulic Floor Jack
- ☐ Center punch
- ☐ File
- ☐ Hammer
- ☐ Wire Brush (to clean bracket mounting surfaces)
- ☐ Silicone Spray Lubricant
- ☐ Dot 3 Brake Fluid
- ☐ Enamel Paint
- ☐ Tape Measure
- ☐ **Safety Glasses** (wear safety glasses at all times)

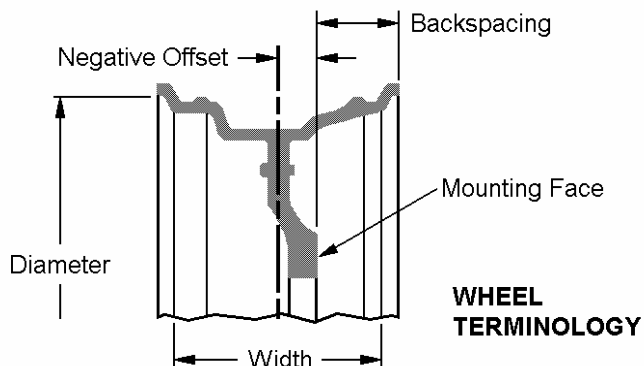
J. It is extremely important to replace torsion bars, CV flanges, and front drive shaft/pinion relationships as original. Be sure to mark left/right, front/rear, and indexing of mating parts before disassembly. A paint marker or light colored nail polish is handy for this.

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 wheel & tire combination: 17" x 8.5" wheel with 5 inches of backspacing and a 35" x 12.5" tire. Before installing any other combination, consult your local tire and wheel specialist.



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...

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)			



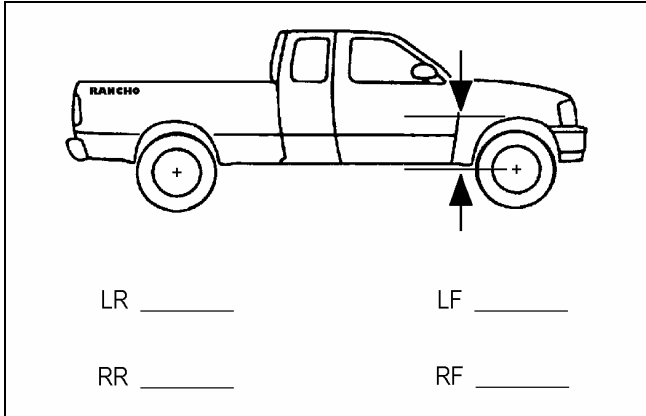
PARTS LIST

<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY.</u>	<u>P/N</u>	<u>DESCRIPTION</u>	<u>QTY.</u>
	Box 1 of 4				
176588B	Sub-frame	1	860562	Sub-frame Hardware Kit	1
			176421	Centering Plate	2
				M16-2.0 x 140 HHCS	4
860354	Box 2 of 4			M16-2.0 Stover Nut	4
176230	Knuckle, Left	1		M16 Washer	8
				USS Washer	6
860355	Box 3 of 4			Thread Lock	2
176231	Knuckle, Right	1		Tie Wrap	4
	Box 4 of 4		860572	Axle Tube Hardware Kit	1
170108	Brake Hose, Left	1		M12-1.75 x 80 HHCS	2
170109	Brake Hose, Right	1		M12-1.75 x 70 HHCS	2
176238	Axle Tube Drop Bracket, Front Half	1		M12-1.75 Stover Nut	4
176239	Axle Tube Drop Bracket, Back Half	1		M12 Washer	8
176240	Differential Drop Bracket, Left Half	1	860670	Rear Bump Stop Hardware Kit	1
176241	Differential Drop Bracket, Right Half	1	770106	M12 x 1.75 x 30	2
176242	Differential Drop Bracket, Aft	1	7807	M12 x 1.75 Nylock	2
176419	End Link Extension	2	7915	M12 Washer	4
176422	Differential Bracket Spacer	1	860671	Sub Assembly- Coils	2
176589	Rear Bump Stop	2	821B	Rear Coils	2
602614	Outer Tie Rod End	2	94180	Information Pack	1
602616	Inner Tie Rod With Jam Nut	2	780281	Rancho Decal	1
860453	Differential Drop Hardware Kit	1	88587	Instructions	1
	M12-1.75 x 60 HHCS	2	94119	Consumer/Warranty Information	1
	M12 1.75 x 65 HHCS	2	94177	Warning Sticker	1
	M12-1.75 Stover Nut	4			
	M12 Washer	8			
860454	Differential Drop Hardware Kit, Aft	1			
420045	Sleeve	2			
	M12-1.75 x 60 HHCS	4			
	M12-1.75 Stover Nut	4			
	M12 Washer	8			
860460	Hub Spacer Kit	1			
176232	Axle Hub Spacer	2			

FRONT SUSPENSION

VEHICLE PREPARATION

- 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.

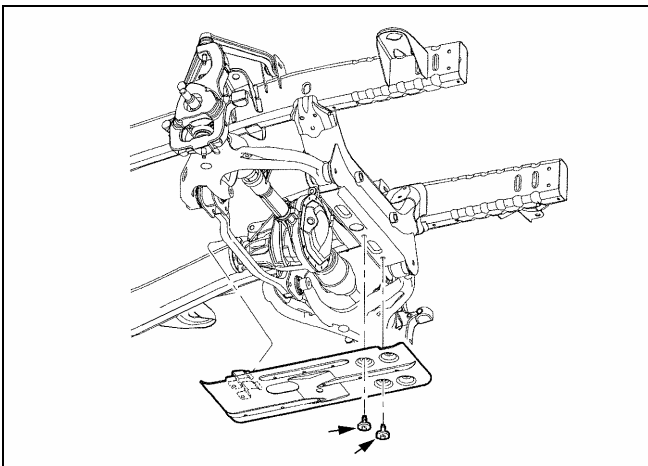


Illus. 1

- 2) ☐ Loosen the front lug and hub nuts before raising the vehicle.
- 3) ☐ Raise the front of the vehicle and support the frame with jack stands. Remove the front wheels and set them aside.

SKID PLATE REMOVAL (IF APPLICABLE)

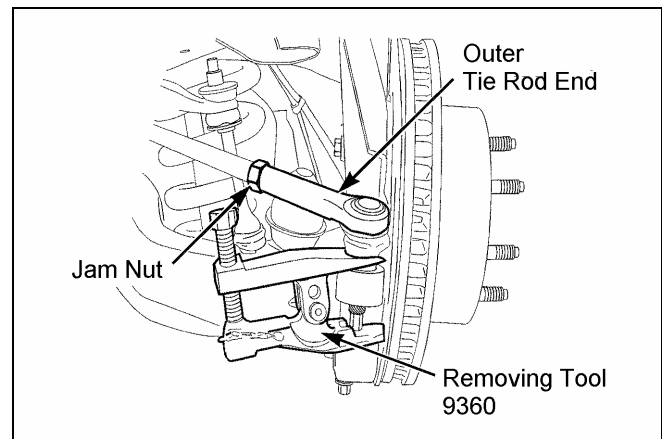
- 1) ☐ Remove the bolts holding the differential skid plate to the front crossmember. See Illustration 2. Slide the skid plate back and remove.



Illus. 2

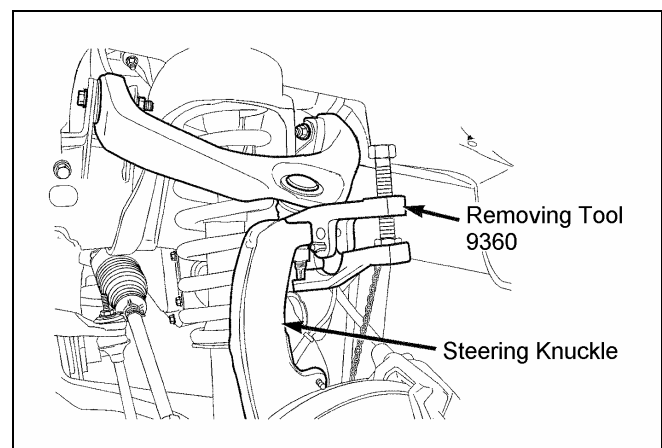
STEERING KNUCKLE REMOVAL

- 1) ☐ Remove the brake caliper and its mounting bracket as an assembly. **Hang the caliper assembly with wire or a tie wrap.**
- 2) ☐ Mark the brake rotor left or right. Remove the brake rotor. If applicable, disconnect the ABS speed sensor.
- 3) ☐ Remove the axle shaft hub nut.
- 4) ☐ Loosen the tie rod end jam nut. Remove the nut from the outer tie rod stud. Disconnect the outer tie rod end from the steering knuckle with removing tool 9360. See illustration 3.



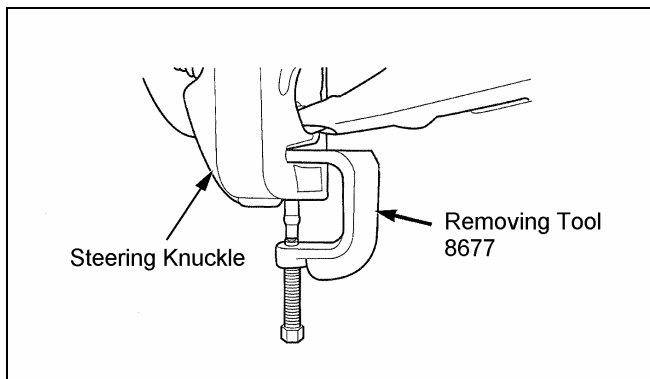
Illus. 3

- 5) ☐ Remove the nut at the upper ball joint. Using removing tool 9360, separate the ball joint from the steering knuckle. See illustration 4.



Illus. 4

- 6) ☐ Remove the nut at the lower ball joint. Using removing tool 8677, separate the ball joint from the steering knuckle. See illustration 5.

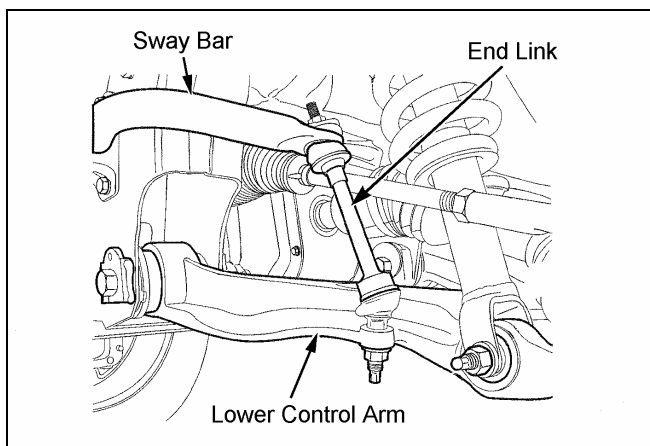


Illus. 5

- 7) ☐ Remove the steering knuckle. **Hang the half shaft with wire or a tie wrap.**
- 8) ☐ Repeat steps 1 through 7 for other side.

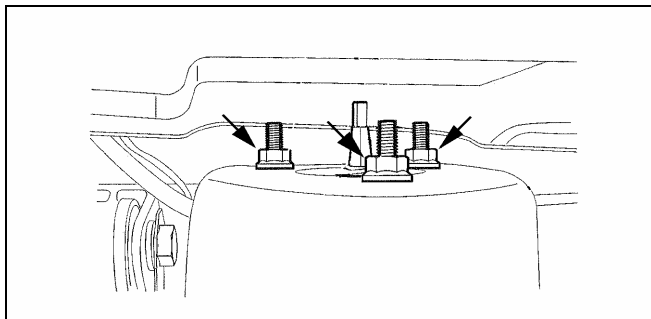
COIL-OVER & LOWER CONTROL ARM REMOVAL

- 1) ☐ Remove the upper nut from both end links. Remove the upper retainers and grommets. Separate the sway bar from the end links. See illustration 6.



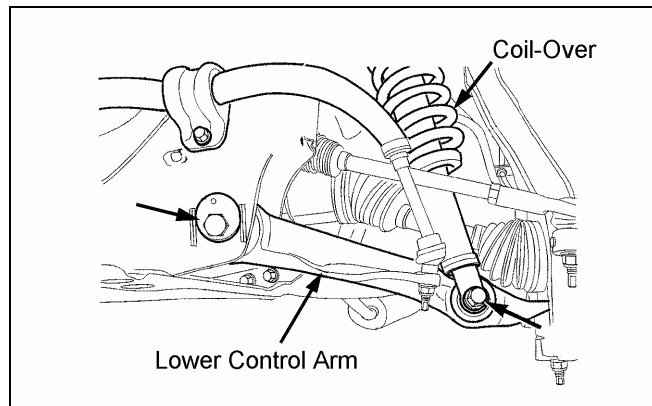
Illus. 6

- 2) ☐ Support the lower control arm with a jack.
- 3) ☐ Remove the three upper coil-over nuts. See illustration 7. **Do not remove the center rod nut.**



Illus. 7

- 4) ☐ Remove the lower coil-over nut and bolt. See illustration 8. Lower jack and remove the coil-over assembly.

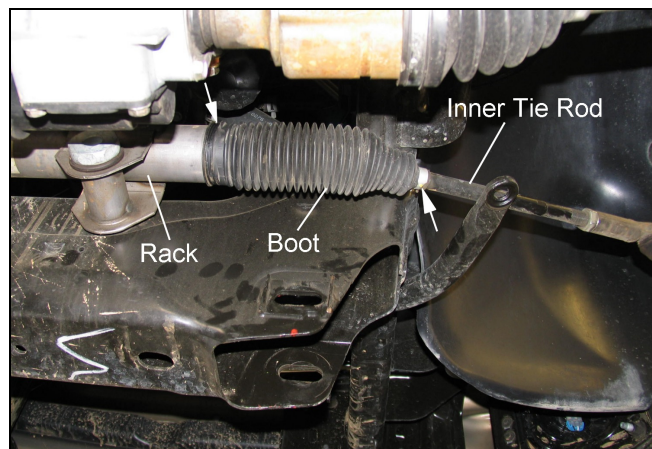


Illus. 8

- 5) ☐ Mark the lower control arm pivot bolts for installation reference. Remove the lower control arm pivot bolts. Refer to illustration 8. Remove the lower control arm.
- 6) ☐ Repeat steps 2 through 5 for the other side.

INNER & OUTER TIE ROD REPLACEMENT

- 1) ☐ Remove clamps from rack and pinion boot. See illustration 9. Slide boot to expose rack and inner tie rod.

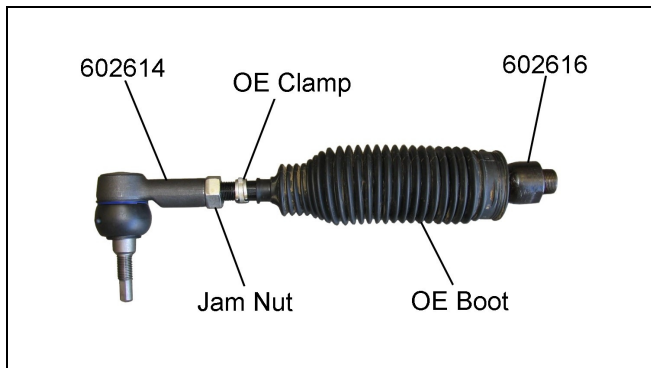


Illus. 9

NOTE: Keep rack clean while exposed.

- 2) ☐ Unthread inner tie rod from rack. Remove the tie rod assembly.
- 3) ☐ Remove outer tie rod end and jam nut. Remove OE clamp and boot.

4) ☐ Install OE boot, OE clamp and new jam nut on inner tie rod 602616. Install jam nut to end of threads and attach outer tie rod end 602614. See illustration 10. As reference leave a .45 gap between jam nut and tie rod end.



Illus. 10

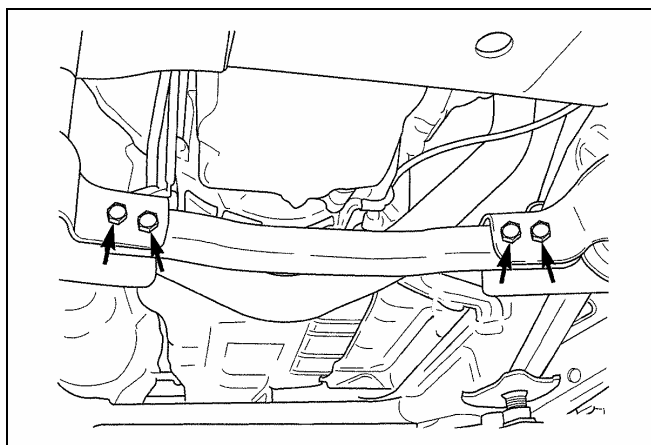
5) ☐ Apply a small amount of thread lock to inner tie rod 602616. Attach new tie rod assembly to rack. Tighten inner tie rod securely. **Do not over tighten.**

6) ☐ Install boot in original location on rack and inner tie rod. Secure boot to rack with a tie wrap from hardware kit 860562. Secure boot to inner tie rod with the OE clamp.

7) ☐ Repeat steps 1 through 6 for the other side.

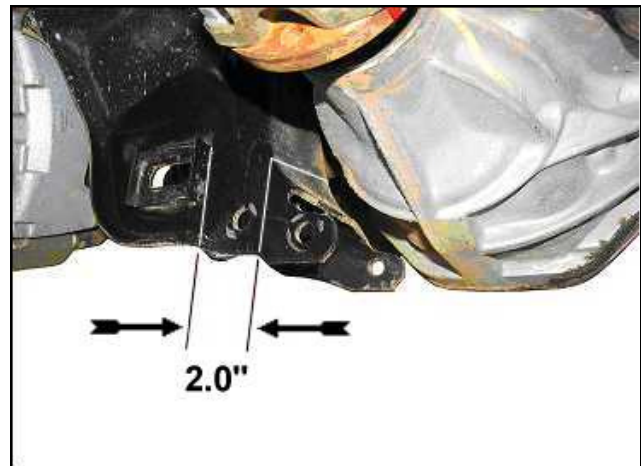
SUB-FRAME INSTALLATION

1) ☐ Remove the bolts attaching the cross member to the rear frame brackets of the lower control arms. See illustration 11. Remove the cross member.



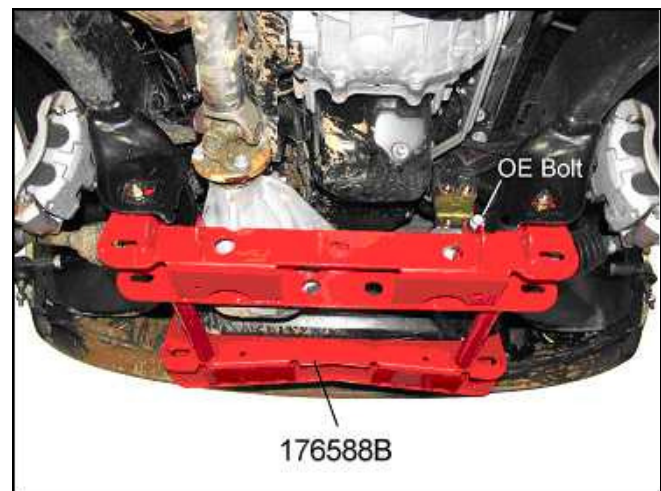
Illus. 11

2) ☐ To provide clearance for the differential, cut off the driver side frame bracket 2.0 inches from the edge of the alignment tab. See Illustration 12. File sharp edges and paint exposed metal.



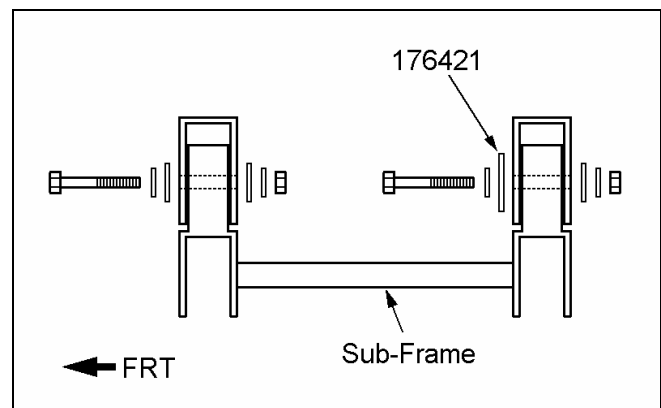
Illus. 12

3) ☐ With an assistant's help, raise sub-frame 176588B up into the lower control arm frame brackets. See illustration 13.



Illus. 13

4) ☐ Attach the sub-frame with the hardware from kit 860562. Install a small washer and centering plate (176421) on each rear bolt. **Insert all bolts from front to back.** See illustration 14.

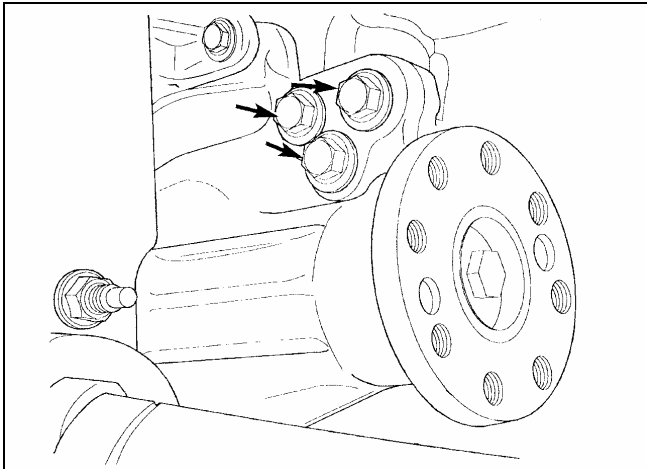


Illus.14

- 5) ☐ Install one of the original cross member bolts as shown in illustration 13. Tighten the OE bolt to 75 ft. lbs. Tighten the sub-frame nuts and bolts to 150 ft. lbs.

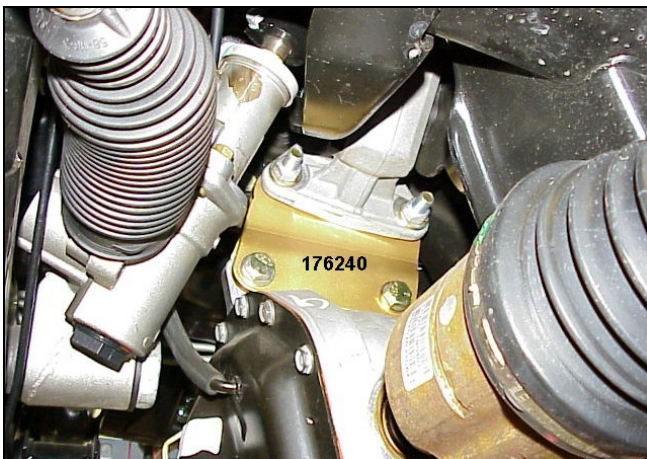
FRONT DIFFERENTIAL DROP BRACKET INSTALLATION

- 1) ☐ Support the front differential assembly with a jack.
- 2) ☐ Remove the differential housing rear mounting bolts. See illustration 15.

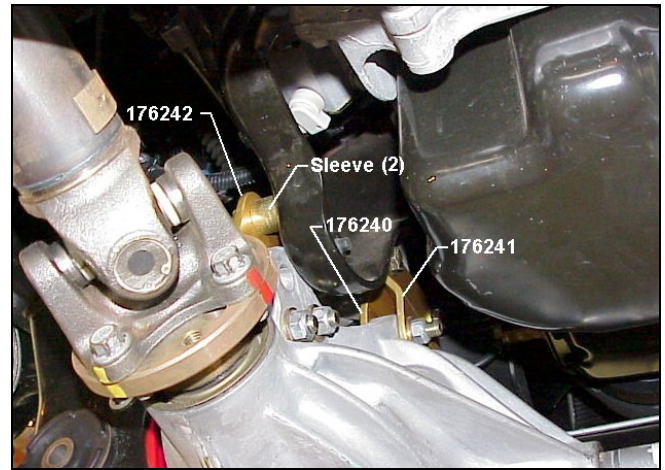


Illus. 15

- 3) ☐ Remove the right axle tube mounting bolts.
- 4) ☐ Remove the differential housing upper mounting bolts. Carefully lower the differential assembly about 4 inches.
- 5) ☐ Using the hardware from kit 860453, loosely attach differential drop brackets 176240 (left half) and 176241 (right half) to the differential upper mount and frame bracket. See illustrations 16 and 17. Use the longer bolts on the bottom.



Illus. 16



Illus. 17

- 6) ☐ Using the hardware and sleeves from kit 860454, loosely attach drop bracket 176242 to the differential rear mount and frame bracket. See illustration 17.
- 7) ☐ Loosely attach spacer bracket 176422 and the axle tube drop brackets 176238 and 176239 with the original bolts on the upper and 12mm hardware from kit 860572 on lower mount. The wider end of each bracket is attached to the top. Use included 12mm washers and nuts for upper bolts. See illustration 18.



Illus. 18

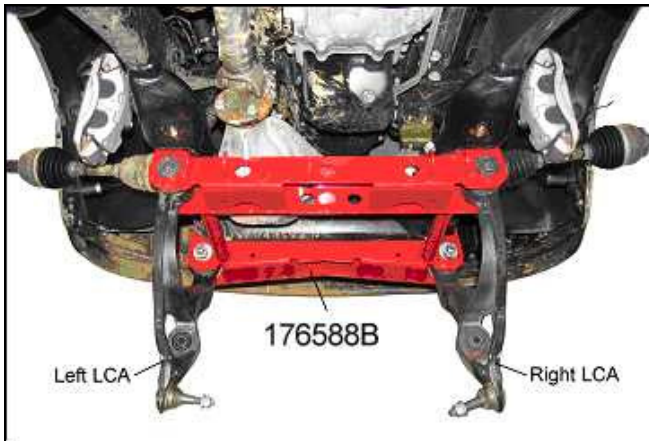
- 8) ☐ Tighten all mounting bolts to 70 ft. lbs.

LOWER CONTROL ARM & SHOCK ABSORBER INSTALLATION

- 1) ☐ Insert the left lower control arm into the sub-frame pockets on the driver side. Loosely attach the control arm with the original hardware. Align Cam Bolts if so equipped.

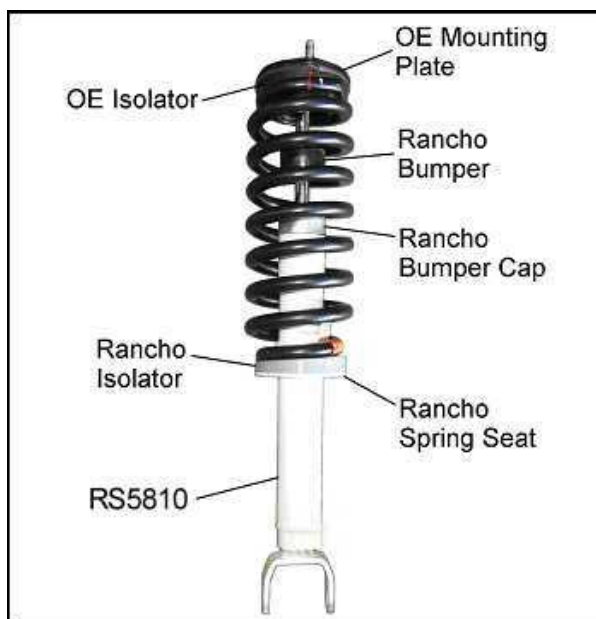
NOTE: Do not tighten pivot bolts until vehicle is at normal ride height.

- 2) ☐ Insert the right lower control arm into the sub-frame pockets on the passenger side. Loosely attach the control arm with the original hardware. See illustration 19.



Illus. 19

- 3) ☐ Install the driver side coil over assembly into a quality spring compressor. Mark coil, shock and upper mount for installation reference. Carefully compress the coil spring.
- 4) ☐ Hold the shock shaft and remove the upper shock nut. Remove the shock.
- 5) ☐ Assemble new shock absorber RS5810.
- 6) ☐ Insert shock assembly into coil spring. Install OE isolator, OE jounce bumper and mounting plate. See illustration 20. Align reference marks and install upper nut. Tighten nut to 45 ft. lbs.



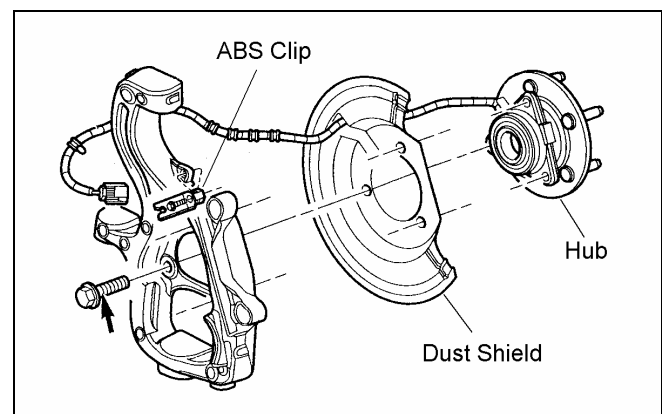
Illus. 20

- 7) ☐ Carefully release tension on coil spring. Remove coil over from spring compressor.

- 8) ☐ Repeat steps 3 through 7 for the passenger side.

FRONT SHOCK & STEERING KNUCKLE INSTALLATION

- 1) Insert the top of the right coil over assembly into the passenger side frame bracket. Attach coil over to bracket with the original nuts. Tighten nuts to 45 ft. lbs.
- 2) Loosely attach the bottom of the coil over to the lower control arm with the original hardware. Insert bolt from back to front.
- 3) ☐ Remove the three hub mounting bolts from the passenger side steering knuckle. Separate the hub, dust shield and ABS clip (if applicable), from the knuckle. See illustration 21.



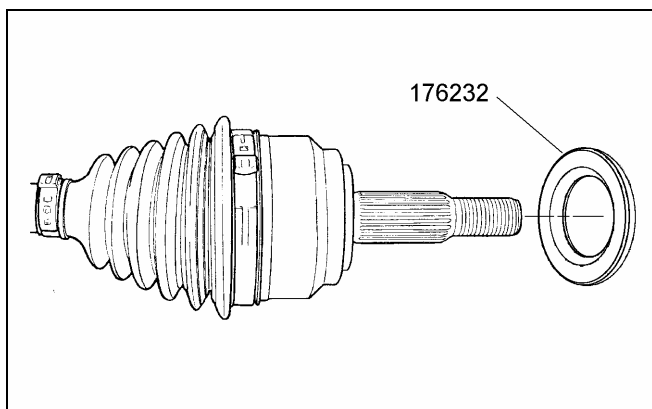
Illus. 21

- 4) ☐ Attach dust shield, hub and ABS line (use tie-wrap) to right steering knuckle 176231. Tighten hub bolts to 120 ft. lbs.

NOTE: If equipped with ABS brakes, position the speed sensor opening on the hub toward the front of the vehicle.

- 5) ☐ Install axle hub spacer 176232 on the passenger side axle shaft. See illustration 22.
- 6) ☐ Support the lower control arm with a jack. Insert axle shaft through hub and install steering knuckle 176231 onto the lower ball joint. Install lower ball joint nut.

CAUTION: The ball joint studs must be free from residue (nylon) prior to installing new knuckle.



Illus. 22

- 7) ☐ Insert the upper ball joint into the knuckle. Install upper ball joint nut. See illustration 23.



Illus. 23

- 8) ☐ Tighten the upper ball joint nut to 40 ft. lbs. Tighten the lower ball joint nut to 38 ft. lbs. **An additional 90 degree turn is required for both nuts.**
- 9) ☐ Install the axle shaft hub nut and tighten to 185 ft. lbs.
- 10) ☐ Attach outer tie rod end to steering knuckle with the original nut. Tighten ball stud nut to 45 ft. lbs. Tighten the jam nut to 94 ft. lbs.
- 11) ☐ Repeat steps 1 through 10 to install the left coil over and steering knuckle 176230 on the driver side.

BRAKE HOSE REPLACEMENT

- 1) ☐ Separate the passenger side brake line from the brake hose at the frame rail. Plug line to prevent brake fluid seepage.

NOTE: If the master cylinder becomes empty, then the entire brake system must be bled. Follow manufacturer's recommendations for bleeding the entire system.

- 2) ☐ Remove the bolt holding the brake hose to the frame. See illustration 24.



Illus. 24

- 3) ☐ Install the brake rotor. Attach the front caliper to the steering knuckle with the original mounting bolts. Tighten the caliper mounting bolts to 130 ft. lbs.
- 4) ☐ Remove the brake hose banjo bolt at the caliper. Remove brake hose.
- 5) ☐ Attach right brake hose 170109 to the caliper with new washers and the original banjo bolt. See illustration 25. Tighten the bolt to 20 ft. lbs.



Illus. 25

- 6) ☐ Attach brake hose 170109 to the brake line and frame. Tighten the original frame bolt to 7.5 ft. lbs. and the brake line fitting to 14 ft. lbs.

- 7) ☐ Repeat steps 1 through 6 to install left brake hose 170108 on the driver side.
- 8) ☐ Bleed the front brakes as follows:
- Fill master cylinder reservoir with approved brake fluid.
 - Attach a clear hose to bleeder valve of right front caliper. Immerse other end of hose into glass container partially filled with brake fluid.
 - Open bleeder valve, and then have a helper press down on the brake pedal.
 - Close bleeder valve and repeat process until fluid is clear and free of bubbles.
 - Repeat steps for left front caliper.

END LINK EXTENDER INSTALLATION

- 1) ☐ Apply thread lock to the original end link. Attach end link extender 176419 to end link. See illustration 26. Tighten extender securely.



Illus. 26

- 2) ☐ Attach the end link assembly to the sway bar with the original retainers, bushings and nut. Tighten nut to 20 ft. lbs.
- 3) ☐ Repeat steps 1 and 2 for the other side.
- 4) ☐ Install front wheels and lower vehicle to ground. Tighten the lug nuts to 130 ft. lbs.
- 5) ☐ Align reference marks and tighten the lower control arm pivot bolts to 150 ft. lbs. Tighten the lower shock mounting bolts to 155 ft. lbs.

REAR SUSPENSION

SHOCK ABSORBER & COIL SPRING REMOVAL

- 1) ☐ Chock front wheels. Raise the rear of the vehicle and support the frame with jack stands. Remove rear wheels.
- 2) ☐ Support the rear axle assembly with a floor jack.
- 3) ☐ Remove the bolt and nut holding the track bar to the rear axle.
- 4) ☐ Remove the upper and lower shock mounting bolts. Remove shock absorber.
- 5) ☐ Remove upper end link mounting bolt, brake line wire hanger, and ABS lines from holders.
- 6) ☐ Repeat step 4 and 5 for other side.
- 7) ☐ Carefully lower the rear axle. Do not allow the axle to hang by any hoses or ABS cables. Remove both coil springs and insulators from vehicle.

BUMP STOP & COIL SPRING INSTALLATION

- 1) ☐ On driver's side, place bump stop spacer RS176589 on top of lower link axle pad. Align the hole in the spacer with the existing hole on the axle pad.
- 2) ☐ Attach bump stop spacer to axle pad with 12mm hardware from kit RS860670. Tighten to 50 ft. lbs. See Illustration 27.
- 3) ☐ Repeat steps 1 & 2 for passenger side.



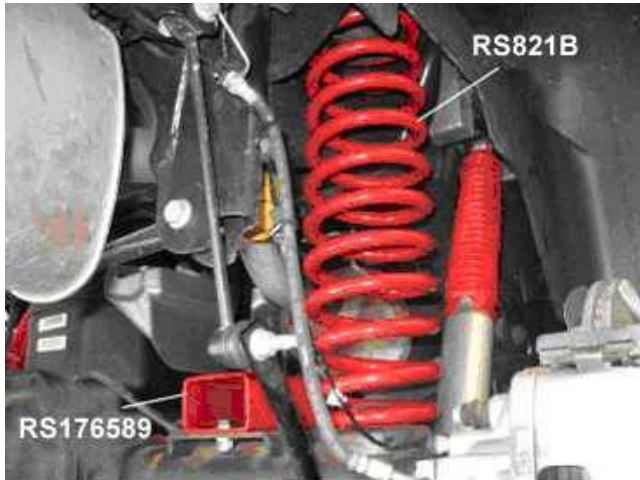
Illus. 27

4) ☐ On driver side place coil spring RS821B onto the rear axle pigtail end down. Attach original insulator to top of coil, then raise the axle guiding the springs into the frame pockets. See Illustration 28.

5) ☐ Attach new Rancho shock absorbers (RS5369 only) to the upper and lower mounts. Tighten securely.

6) ☐ Repeat steps 4 and 5 for passenger side.

7) ☐ Re-attach upper end links, brake-line wire hangers, and ABS lines



Illus. 28

Note: Failure to use Rancho rear shocks RS5369 could lead to coil spring damage.

8) ☐ Install rear wheels and lower vehicle to ground. Tighten lug nuts to 140 ft. lbs.

9) ☐ Reinsert original track bar bolt into axle bracket. Tighten to 110 ft. lbs. See illustration 29.



Illus. 29

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. If new brake hoses were installed, verify that each hose allows for full suspension movement.

4) ☐ Readjust headlamps. Have vehicle aligned at a certified alignment facility.

Recommended Alignment Specifications

Caster (degrees): $3.75^{\circ} \pm .75^{\circ}$

Camber (degrees): $0^{\circ} - .3^{\circ}$

Sum Toe In (degrees): $.1^{\circ} \pm .1^{\circ}$

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