

INSTALLATION INSTRUCTIONS



For Rancho Suspension Systems:

RS66402B — 4½" Lift

2017-2013 Ram 1500 4WD

DOES NOT FIT VEHICLES EQUIPPED WITH AIR RIDE.



Fits OE 17" and up rims
ONLY WITH OE TIRES

WARNING

Carefully read, understand and follow the instructions provided in this manual, and keep it in a safe place for future reference. If you have any doubt whatsoever regarding the installation or maintenance of your Rancho suspension system, please see your retailer for assistance or advice. Failure to follow the warnings and instructions provided herein can result in the failure of the suspension system, or can cause you to lose control of your vehicle, resulting in an accident, severe personal injury or death.

These instructions should remain in the vehicle glove box for future reference.

⚠ WARNING: READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION. Failure to follow the warnings and instructions provided herein can result in an accident, severe personal injury or death.

PRELIMINARY

This manual presumes that all persons installing this suspension system have a high level of mechanical training and experience, and have available to them all necessary tools and safety equipment. This manual is not and should not be construed as an exhaustive list of all required safety measures. Personnel should rely primarily on their training and experience, as well as on their own common sense.

This Manual is to be read as a supplement to, and must not be construed as a substitute for, the owner's manual and/or shop manual that originally accompanied the vehicle. Refer to such use, operation, maintenance and safety manuals as necessary, and especially after installation is complete, to insure proper vehicle operation.

The following terminology has been used in this Manual:

ACCIDENT: Any event which could cause personal injury or death to anyone installing or using the suspension system, as well as to passengers and bystanders, or otherwise may result in property damage.

PRE-INSTALLATION WARNINGS and INSTRUCTIONS

⚠ WARNING: Only the following rim/tire sizes may be used with this suspension system: 295/60R20 tire, 20x9-in 0 offset wheel.

Use of any other rim/tire combination increases the risk of a roll-over and/or accident, resulting in severe personal injury or death.

⚠ 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

1) Service and repair tasks require specialized knowledge, training, tools, and experience. General mechanical aptitude may not be sufficient to properly install this suspension system. If you have any doubt whatsoever regarding your ability to properly install the suspension system, please consult a qualified mechanic.

2) Your brake lines and fuel lines should remain undisturbed during and after installation. If you think you need to modify these components in any way, you are mistaken. You are installing the lift improperly and will be creating a significant risk of an accident. In case of any doubt, consult a qualified mechanic.

3) If any component does not fit properly, something is wrong. You are installing the lift kit improperly and will be creating a significant risk of an accident. Never modify any component of the vehicle or suspension system, except as instructed herein. Do not continue with installation until you have identified the problem.

4) Several of the procedures described herein require at least two (2) persons to safely complete the task. If you have any doubt about your ability to complete any operation by yourself, always ask for help from a qualified assistant.

5) Before starting any operation, confirm that all personal safety devices and safety equipment are in proper condition and position.

6) Give your work undivided attention. Looking around, carrying on a conversation and "horse-play" are careless acts that can result in an error in installation and/or serious injury.

7) Install only tires approved by the United States Department of Transportation ("DOT approved"). Make sure the rim and tire size are properly matched.

8) If any components of the vehicle or suspension system are damaged in any way during installation, immediately replace the component.

9) During installation, carefully inspect all parts of the vehicle and replace anything that is worn or damaged.

10) Nip points present the risk of the catching, lacerating, crushing and/or amputating fingers, hands, limbs and other body parts during operations. Always keep clear. Wear protective gloves.

11) Oil and hydraulic fluids are poisonous, dangerous to health and are known to the State of California to cause cancer, birth defects or other reproductive harm. Do not inhale vapors or swallow. Do not allow contact with the eyes or skin. Should any oil or fluids be swallowed or inhaled or come into contact with the eyes, immediately follow the safety precautions on the label or call a poison control center immediately. Should any of the oil or fluids contact your skin, immediately wash thoroughly.

12) Never install the suspension system if you are under the effects of alcohol, medications and/or drugs. If you are taking prescription or over the counter medication, you must consult a medical professional regarding any side effects of the medication that could hinder your ability to work safely.

AFTER INSTALLATION WARNINGS AND INSTRUCTIONS

13) After installation is complete, drive the vehicle slowly in an area free from heavy traffic for at least three (3) miles. Likewise, before traveling on any highways or at a high rate of speed, drive the vehicle for ten (10) miles on side roads at moderate speed. If you hear any strange noise or feel unusual vibration, if a component of the suspension system is not operating properly, or if any warning lights illuminate or buzzers sound, stop the vehicle immediately. Identify the cause and take any necessary remedial action.

14) Confirm that all components of the vehicle, including all lights (headlights, turn signals, brake lights, etc.), linkages (accelerator, etc.), electrical switches and controls (windshield wipers and defoggers, etc.), and other warning devices (low tire pressure monitoring systems) are fully operational.

15) Your headlights will need to be readjusted before the vehicle is used on the roads. Consult the vehicle owners' manual.

16) The speedometer and odometer will need to be recalibrated after installation. See your dealer.

17) Confirm proper rear view and side view while seated in the driver seat. Install supplemental mirrors as necessary.

18) Your original low tire pressure monitoring system may be re-installed in your new wheels. However, if you choose to purchase a new system, see your dealer to have them properly calibrated. Proper tire pressure is critical to safe operation of the vehicle.

OPERATION

19) Because it has been modified, the vehicle will not handle, turn, accelerate or stop in the same manner as an unmodified vehicle. In addition, the crash protection systems designed in the vehicle may operate differently from an unmodified vehicle. For example, turning and evasive maneuvers must be executed at a slower rate of speed. Further, there is a greater risk that the vehicle could roll over. These differences could result in an increased possibility of an accident, personal injury or death. Learn the vehicle's operations and handling characterizes and drive accordingly.

IMPORTANT NOTES

- 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). Have all suspension, steering and driveline components inspected and replaced if worn or damaged
- B. The components of Rancho's suspension system are designed as a single integrated system. To avoid compromises in terms of safety, performance, durability or function, do not install a body lift kit with Rancho's suspension system or interchange parts from this system with components from another manufacturer. Use of other components will result in the forfeiture of any type of warranty on the vehicle/suspension system.
- C. Some components required for the installation of this kit may need to be purchased separately. See "*SPECIFICATIONS & REQUIREMENTS*" on next page of this manual.
- D. 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.
- E. 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.
- F. 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 at end of instruction.
- G. 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.
- H. 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.
- I. Unless otherwise specified, tighten all nuts and bolts to the standard torque specifications shown in the table at end of instruction. USE A TORQUE WRENCH for accurate measurements.
- J. Do not weld anything to these components, and do not weld any of these components to the vehicle unless specifically stated in the instructions
- K. It is extremely important to replace coil springs, axle flanges, and 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.
- L. Suspension components that use rubber or urethane bushings should be tightened with the vehicle at normal ride height unless otherwise specified. This will prevent premature failure of the bushing and maintain ride comfort.
- M. Some of the service procedures require the use of special tools designed for specific procedures. If you do not know how to safely use any of these tools, or do not have them, stop the project and consult a qualified mechanic. See "*Tools and Supplies*" on next page of this manual
- N. The required installation time for this system is approximately 5 to 6 hours for two people. 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.
- O. 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.
- P. The lifespan of Rancho products depends on many factors. Improper use, abuse or harsh use in general may compromise the integrity of the suspension system and significantly reduce its lifespan. The suspension system is also subject to wear over time. Have the suspension system regularly inspected and maintained by qualified mechanics. If the inspection reveals any damage or excessive wear, no matter how slight, immediately replace or repair the component. The suspension system must be regularly maintained in order to optimize its safe and efficient use. The more severe the conditions under which the suspension system is operated, the more often it must be inspected and maintained.
- Q. If any component breaks or bends, contact your local Rancho dealer or Rancho for replacement parts or, contact the Rancho Technical Department at 1-734-384-7804.

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 AN IMPROPER INSTALLATION**

The driver of this suspension system recognizes and agrees that there are risks inherent in driving a vehicle with a lifted suspension system, including but not limited to the risk that you could be involved in an accident that would not occur in an unmodified vehicle. By his/her purchase and use of this suspension system, the user expressly, voluntarily and knowingly accepts and assumes these risks, and agrees to hold Tenneco, Inc. and its related companies harmless to the fullest extent permitted by law against any resulting damages.

SPECIFICATIONS & REQUIREMENTS

Shock Absorbers

New Rancho shock absorbers must be used with this kit, and must be purchased separately

⚠WARNING Use of the wrong shock absorbers can cause damage to vehicle without the damage being visible to you, resulting in loss of vehicle control and an accident

Required Rancho Shock Absorbers

	Front	Rear
RS7000MT	RS7810	RS7369
RS5000X	RS55810	RS55369
RS5000	RS5810	RS5369

Wheels and Tires

This suspension system was developed using the following tire & wheel combination:

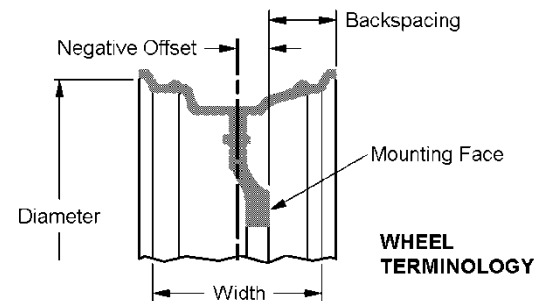
Tire: LT295/60R20

Wheel: 90 x 9 x 0 Offset (5.0" Backspacing)

Before installing any other combination, consult your local tire and wheel specialist.

Compatible With OE Wheels	Development Tire Size (Actual)	Wheel Size (Backspacing)
Yes – 17" and up with OE tires ¹	LT295/60R20 (34"x11.7")	20x9 (5.0")

¹ OE wheels compatible with stock size tires only.

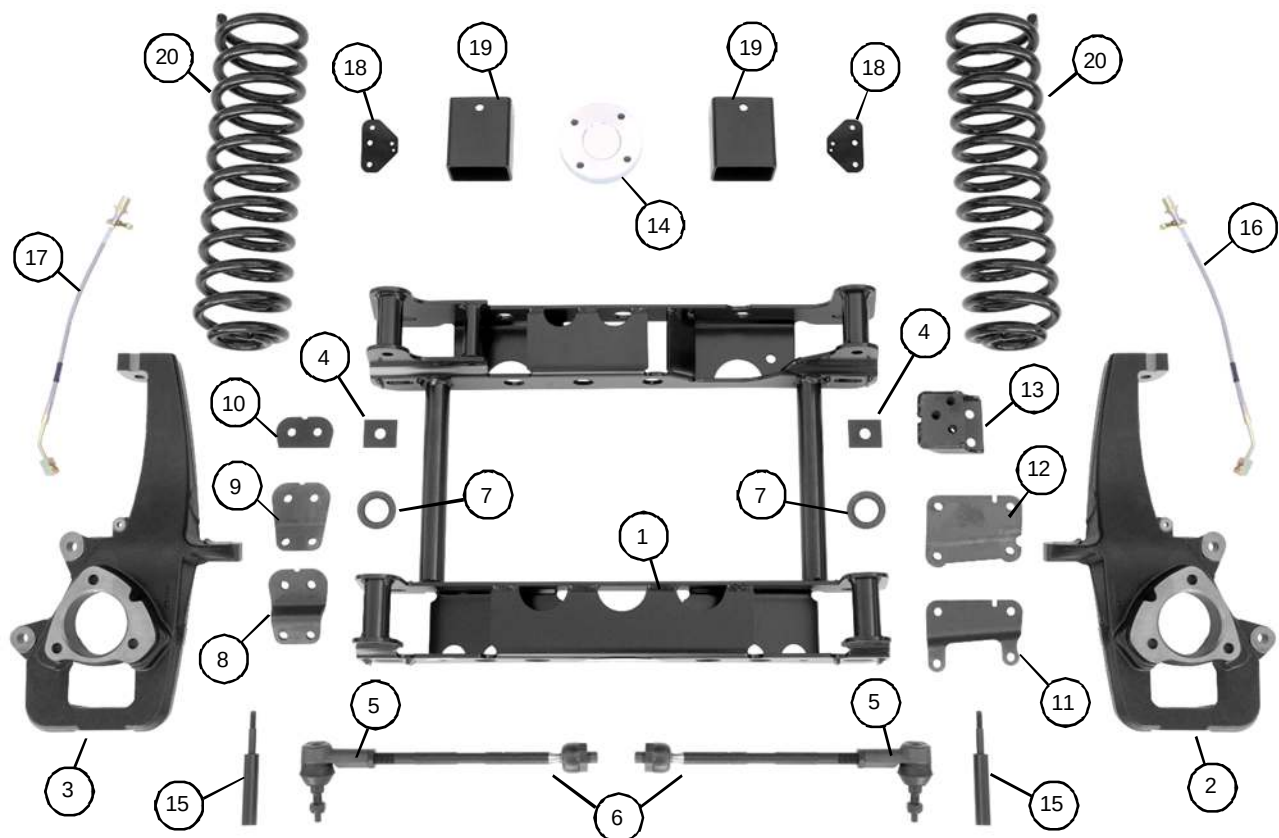


Tools and Supplies (BECAUSE OF VEHICLE VARIATIONS, THIS MAY NOT BE A COMPLETE LIST)

Dodge Service Manual
Coil Spring Compressor
Ball Joint Removing Tools 8677 & 9360
(Miller or Mopar)
Drill motor
Reciprocating saw
Assorted Drills: 1/8" through 1/2"
Torque Wrench (250 FT-LB capacity)
1/2" Drive Ratchet and Sockets

Assorted Socket Extensions
(at least 18" combined)
21 mm Open End Crowfoot Wrench
(Snap-on SCOM21 or equivalent)
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)
Dot 3 Brake Fluid
Black Enamel Paint
Silicone Spray Lubricant
Tape Measure
Safety Glasses--
Wear safety glasses at all times



Parts List

ITEM	PART #	DESCRIPTION	QTY
	RS66402B-1	Box 1	1
1	RS176588B	Sub Frame	1
	RS66402B-2	Box 2	1
2	RS176230	Knuckle, Left	1
	RS66402B-3	Box 3	1
3	RS176231	Knuckle, Right	1
	RS66402B-4	Box 4	1
	RS860562	Sub Assy - Subframe	1
	RS7861	Washer, M16	8
	RS770030	Nut, M16-2.00 Top Lock	4
	136763624	Strap-Black	4
	RS42702	.5 cc Thread Lock	2
4	RS176421	Subframe Washer	2
	RS770040	HHCS, M16-2.0X140	4
	RS770151	Washer, 5/8 USS	6
5	RS602614	Outer Tie Rod End	2
6	RS602641	Inner Tie Rod	2
	RS860460	Sub Assy, Ram Hub Spacer	1
	RS176232	Hub Spacer	2
8	RS176841	Right Diff Drop – Forward Bracket	1
9	RS176834	Right Diff Drop – Rear Bracket	1
10	RS176837	Right Drop Diff Spacer	1
11	RS176651	Driver Side Diff Drop – Right Bracket	1
12	RS176240	Driver Side Diff Drop – Left Bracket	1
	RS860820	Sub Assy, Diff Drop Brackets	2
	RS770072	HHCS, M12-1.75X60	2
	RS7915	Washer, M12	4
	RS7911	Nut, M12-1.75 Top Lock	2
13	RS176653	Aft Diff Drop Bracket	1
	RS860707	Sub Assy - Aft Diff Drop Bracket	1
	RS770107	HHCS, M12-1.75X35	6
	RS7915	Washer, M12	6

ITEM	PART #	DESCRIPTION	QTY
14	RS176835	Front Drive Shaft Spacer	1
	RS860822	Sub Assy, Drive Shaft Spacer	1
	RS770108	HHCS, M12-1.75X40	4
	RS7915	Washer, M12	4
15	RS176419	Front Sway Bar End Link Extension	2
16	RS170108	Brake Line, Front Left	1
17	RS170109	Brake Line, Front Ram	1
	RS860730	Sub Assy, Rear Brake Line	1
18	RS176698	Rear Brake Line/Sway Bar Drop	2
	RS770127	HHCS, M8-1.25X20	2
	RS603112	Nut, M8-1.25 Nylock	2
	RS770128	Washer, M8	4
	136763624	Strap-Black	2
	RS770247	HHCS M12-1.75X25	2
	RS7807	Nut, M12Mm-1.75 Nylock	2
	RS7915	Washer, M12	4
19	RS176589	Rear Bump Stop Spacer	2
	RS860670	Sub Assy, Rear Bump Stop Spacer	1
	RS770106	HHCS, M12-1.75X30	2
	RS7807	Nut, M12-1.75 Nylock	2
	RS7915	Washer, M12	4
	RS860671	Sub Assy, Rear Coil	2
20	RS821B	Rear Coil Spring	1
	RS94180	Information Pack	1
	RS89402	Instructions	1
	RS94177	Rollover Warning Label	1
	RS94119	Consumer/Warranty Information	1
	RS780281	6" Rancho Decal	1
	R-RM0082-1112	Warranty Tag	1

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.

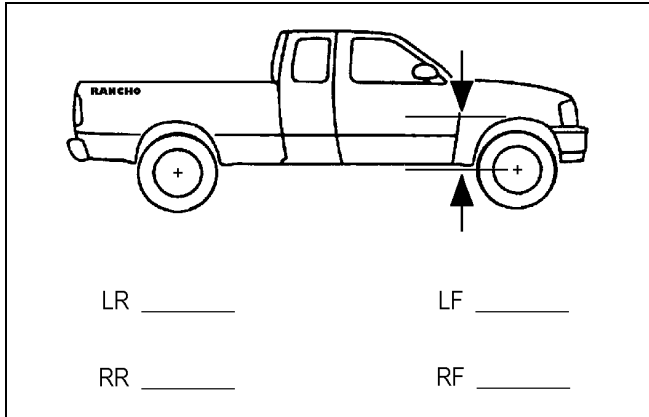


Illustration 1

- 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 cross member. See Illustration 2. Slide the skid plate back and remove.

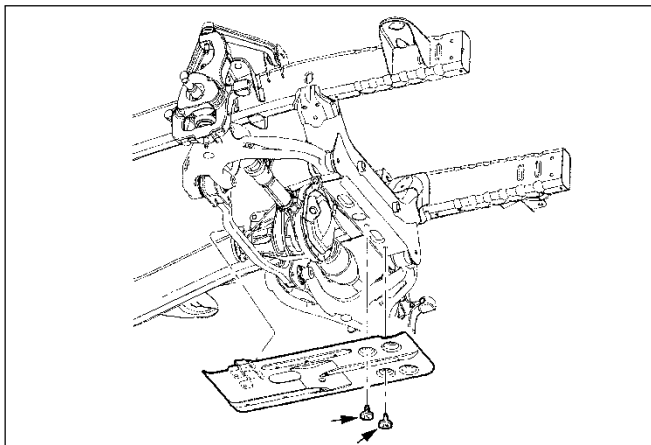


Illustration 2

BRAKE HOSE REPLACEMENT

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

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

- 2) ☐ Remove the bolt holding the brake hose to the frame. See Illustration 3.

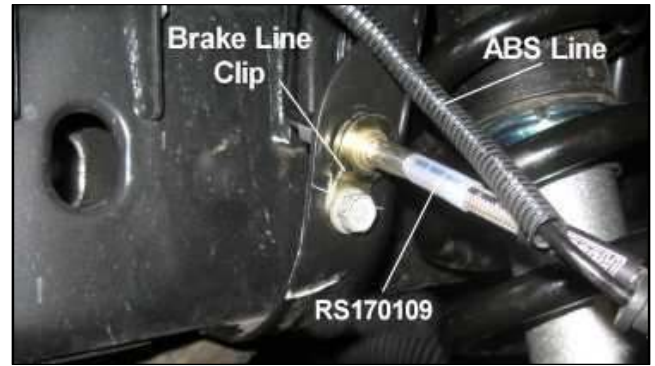


Illustration 3

- 3) ☐ Remove the brake hose banjo bolt at the caliper. Remove brake hose.
- 4) ☐ Attach right brake hose RS170109 to the caliper with new washers and the original banjo bolt. See Illustration 4. Tighten the bolt to 20 ft. lbs.



Illustration 4

- 5) ☐ Attach brake hose RS170109 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.
- 6) ☐ Repeat steps 1 through 6 to install left brake hose RS170108 on the driver side.
- 7) ☐ 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.

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.

⚠ WARNING: Do not allow the caliper to hang by the brake hose. You could damage the hose, without this damage being visible to you, resulting in sudden and unexpected brake failure and an accident.

2) ☐ Mark the brake rotor left or right. Remove the brake rotor. If applicable, disconnect the ABS speed sensor from the hub by removing the allen screw and pulling sensor out of hub.

3) ☐ Remove the axle shaft hub nut.

⚠ WARNING: Do not hammer the ball studs to separate them from components. You could damage the ball studs, without this damage being visible to you, resulting in sudden and unexpected failure of the ball studs and an accident.

4) ☐ Loosen the tie rod end jam nut. Loosen the outer tie rod stud nut. Separate the outer tie rod end from the steering knuckle with removing tool 9360. Remove the nut and outer tie rod stud from knuckle. See Illustration 5.

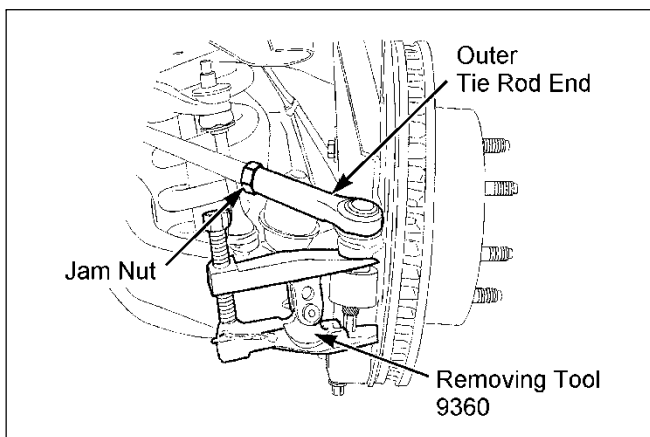


Illustration 5

5) ☐ Loosen the nut at the upper ball joint. Using removing tool 9360, separate the ball joint from the steering knuckle. Pry down upper control arm and remove nut and upper ball joint from steering knuckle. See Illustration 6.

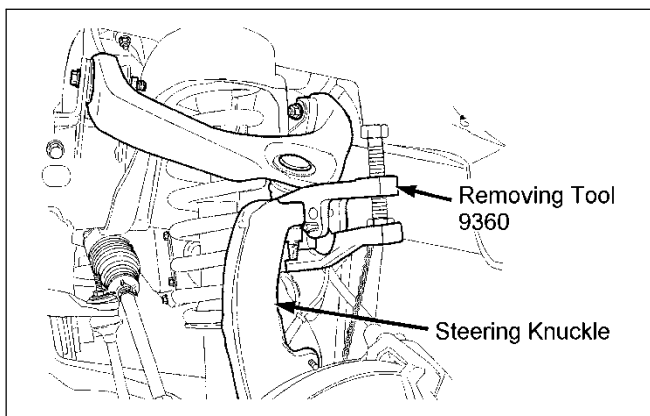


Illustration 6

6) ☐ Loosen the nut at the lower ball joint. Using removing tool 8677, separate the ball joint from the steering knuckle. See Illustration 7.

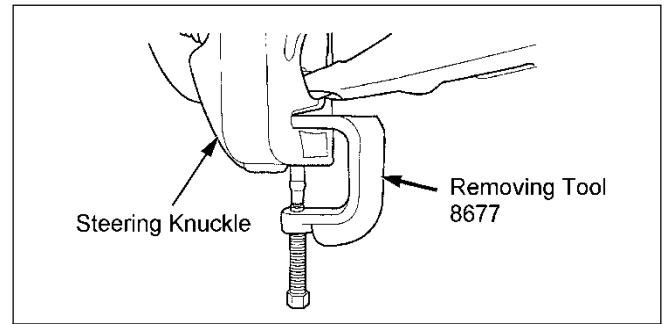


Illustration 7

7) ☐ Remove nut from lower ball joint and 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 8.

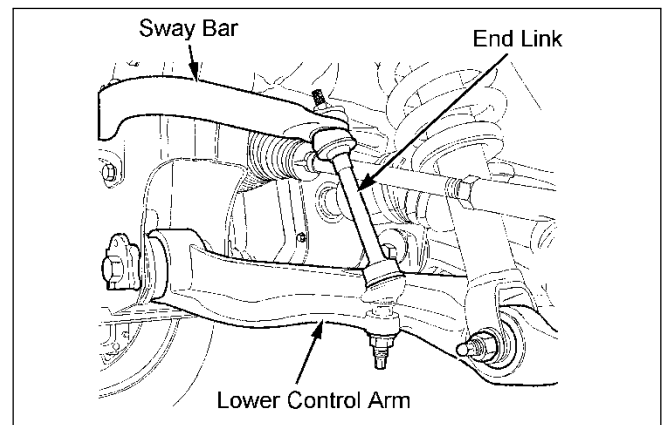


Illustration 8

2) ☐ Mark the lower control arm pivot bolts for installation reference. Loosen, but DO NOT REMOVE the lower control arm pivot bolts. See Illustration 9.

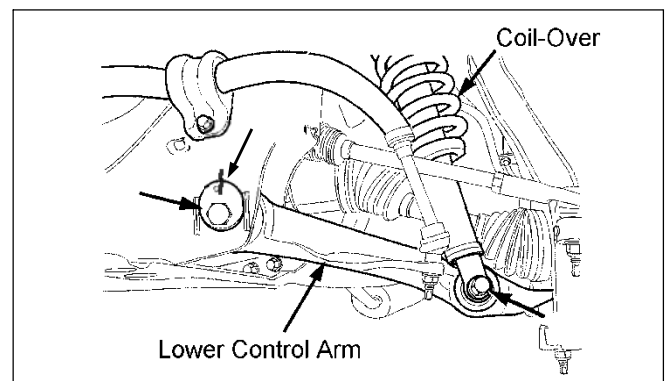


Illustration 9

- 3) ☐ Support the lower control arm with a jack.
- 4) ☐ Remove the three upper coil-over nuts. See Illustration 10. **Do not remove the center rod nut.**

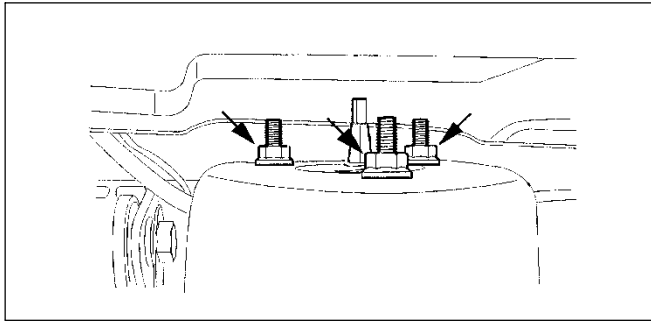


Illustration 10

- 5) ☐ Remove the lower coil-over nut and bolt. See Illustration 9. Lower jack and remove the coil-over assembly.
- 6) ☐ Remove lower control arm pivot bolts and lower control arm.
- 7) ☐ Repeat steps 2 through 6 for the other side.

INNER & OUTER TIE ROD REPLACEMENT

- 1) ☐ Remove clamps from rack and pinion boot. See Illustration 11. Slide boot to expose rack and inner tie rod.

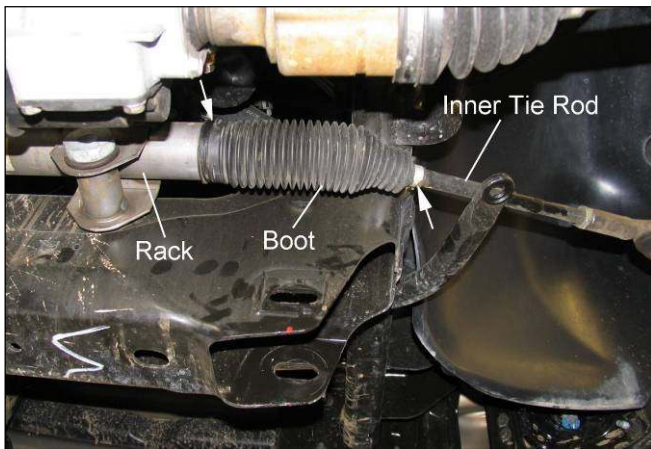


Illustration 11

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 RS602641. Install jam nut to end of threads. See Illustration 12
- 5) ☐ Apply a small amount of thread lock to inner tie rod RS602641. Attach new tie rod assembly to rack. Tighten inner tie rod to 125 ft. lbs. **Do not over tighten.**

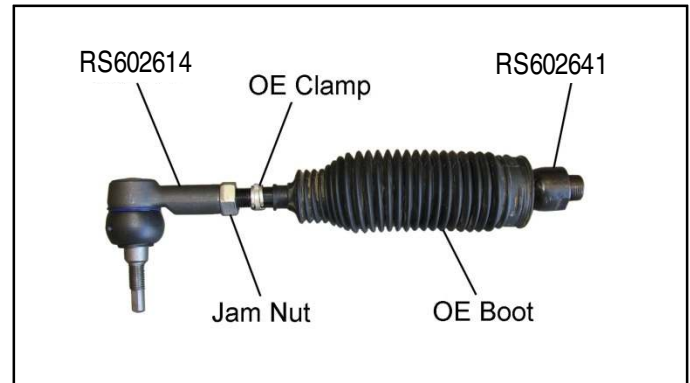


Illustration 12

- 6) ☐ Install boot in original location on rack and inner tie rod. Secure boot to rack with a tie wrap from hardware kit RS860562. Secure boot to inner tie rod with the OE clamp.
- 7) ☐ Attach outer tie rod end RS602614 to tie rod RS602641. As reference leave a .45 gap between jam nut and tie rod end.
- 8) ☐ Repeat steps 1 through 7 for the other side.

FRONT DIFFERENTIAL DROP BRACKET INSTALLATION

- 1) ☐ Remove the bolts attaching the cross member to the rear frame brackets of the lower control arms. See Illustration 13. Remove the cross member.

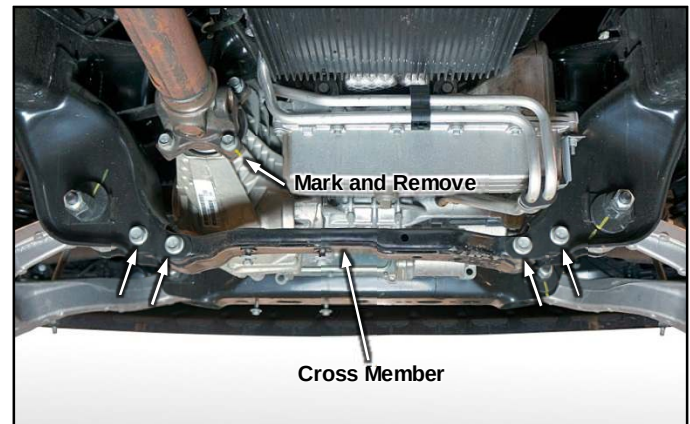


Illustration 13

- 2) ☐ Reference mark and disconnect the front driveshaft at the pinion flange. See Illustration 13.

Hang the driveshaft to prevent damage to CV boot at transfer case end of driveshaft.

- 3) ☐ Disconnect the wire harness plug from the front differential. See Illustration 15.
- 4) ☐ Disconnect any wires or hoses attaching the front differential and axle to vehicle.
- 5) ☐ Carefully remove ties holding axle half shafts.

CAUTION: Take care not to damage CV boot.

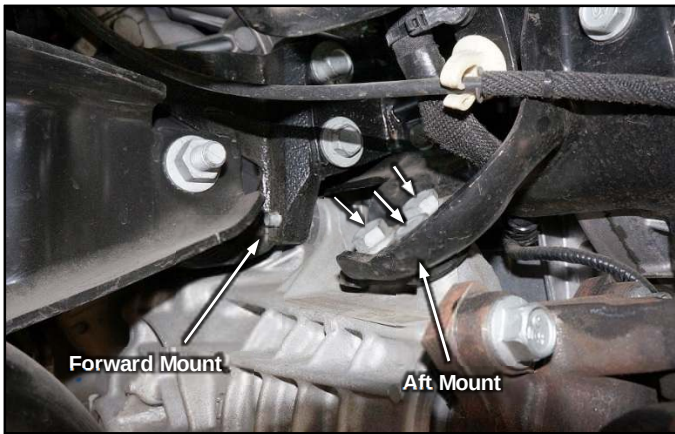


Illustration 14

⚠ WARNING: DO NOT allow differential to be supported only by the right/passenger side axle tube mount. DO NOT allow any twisting or side loading of the right/passenger side axle tube mount. Damage to the differential axle tube can result without the damage being visible to you, resulting in loss of vehicle control and an accident.

- 6) ☐ Support the front differential assembly with a jack.
- 7) ☐ Remove the differential housing aft mounting bolts. See Illustration 14.
- 8) ☐ Remove the passenger side axle tube mounting bolts and axle dampener (if equipped). See Illustration 15.
- 9) ☐ Remove the differential housing driver side forward mount bolts. Carefully lower the differential assembly. See Illustration 16.

CAUTION: Take care not to damage CV boot.

- 10) ☐ To provide clearance for the differential, cut off the driver side cross member frame bracket at the center of the outer cross member mounting hole. See Illustration 17. File sharp edges and paint exposed metal.

⚠ WARNING: Do not use a flame cutter or torch to remove bracket. You could warp, weaken or damage the bracket without the damage being visible to you, resulting in loss of vehicle control and an accident.

WARNING: Failure to follow differential drop bracket installation and torque sequence can result in damage to the differential axle tube!

- 11) ☐ Loosely install aft diff drop bracket RS176653 on differential housing using M12-1.75X35 bolts from kit RS860707. See Illustration 18.
- 12) ☐ Using the OE hardware, loosely attach driver side forward drop brackets RS176240 (left half) and RS176651 (right half) to the OE frame mount. See Illustration 19 and Illustration 20.
- 13) ☐ With the help of an assistant raise the differential up and loosely attach differential's driver side forward mount to differential drop brackets RS176240 and RS176651 using hardware for kit RS86020. See Illustration 20 and Illustration 21.

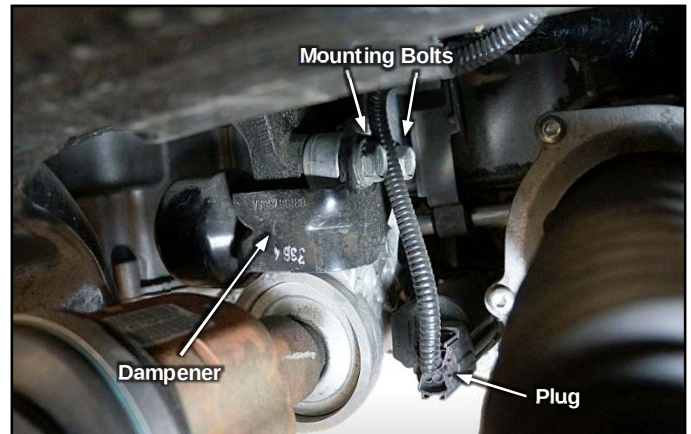


Illustration 15



Illustration 16

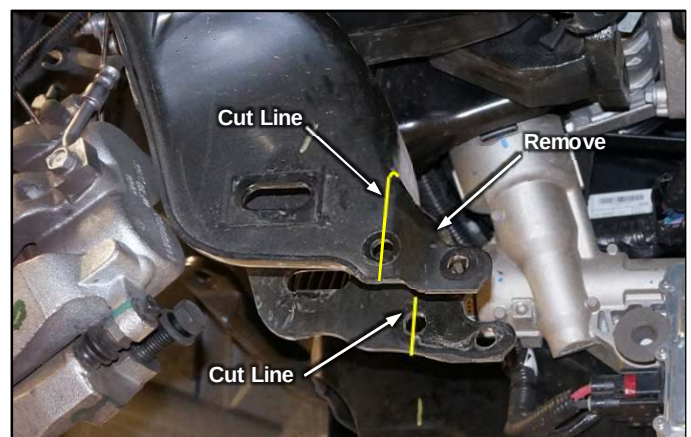


Illustration 17



Illustration 18

14) ☐ Using the remaining hardware from kit RS860707, loosely attach aft drop bracket RS176653 to the aft OE frame mount. See Illustration 21.

15) ☐ Using OE hardware, loosely and the axle tube drop brackets RS176841 (forward half) and RS17634 (rear half) to the passenger side OE frame mount along with spacer RS176422 **OR** the OE dampener mount (if equipped). See Illustration 22 and Illustration 23.

The wider end of each bracket with the notch is attached to the top.

16) ☐ Using 12mm hardware from kit RS860820, loosely attach differential passenger side axle tube mount drop brackets RS176654 and RS176239. See Illustration 22 and Illustration 23.

DO NOT TIGHTEN! BRACKETS MUST BE LOOSE!

TIGHTEN BRACKETS IN THE FOLLOWING ORDER:

17) ☐ **FIRST** - Snug the six differential aft mounting bolts until the aft drop bracket RS176653 sits flush with frame mount and differential. See Illustration 21.

18) ☐ **SECOND** - Snug the four differential housing driver side forward mount bolts until the drop brackets sit flush with the frame mount and differential. See Illustration 20 and Illustration 21.

19) ☐ **THIRD** - Tighten the differential housing aft mounting bolts to 70 ft. lbs.

20) ☐ **FOURTH** - Tighten the differential housing driver side forward mounting bolts to 70 ft. lbs.

21) ☐ **FIFTH** - Slowly snug the passenger side axle tube mounting bolts starting with the upper bolts, while confirming the drop brackets are installed correctly. See Illustration 22 and Illustration 23.

The passenger side brackets must align properly with the mounts. If there is more than 1/16" (.063") gap in any location, shimming will be required to prevent excessive side loads being applied to the differential axle tube.

If the brackets and mount are not parallel to each other, loosen and re-torque the differential housing rear mounting bolts.

WARNING: Do not tighten the passenger axle tube mounting brackets if step 21 cannot be successfully completed!

22) ☐ **SIXTH** - When the right/passenger axle tube mounting and spacer brackets are installed and aligned properly, tighten mounting bolts to 70 ft. lbs.

23) ☐ Hang the half shaft with wire or a tie wrap.

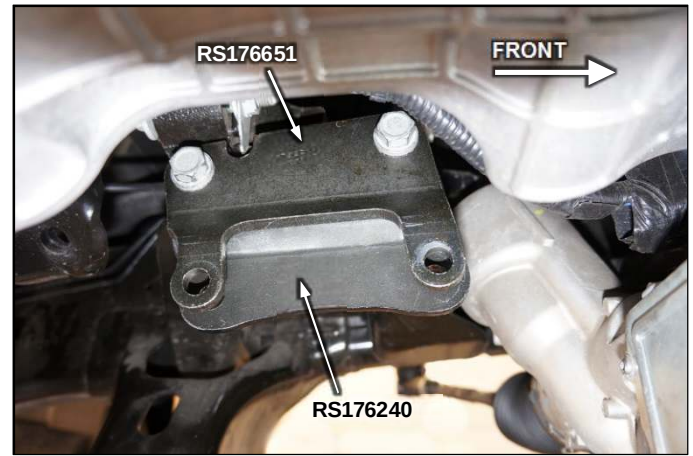


Illustration 19

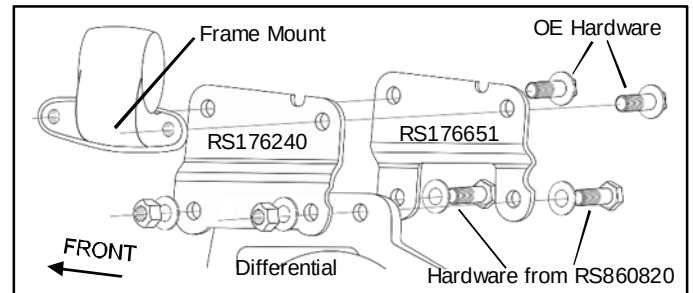


Illustration 20

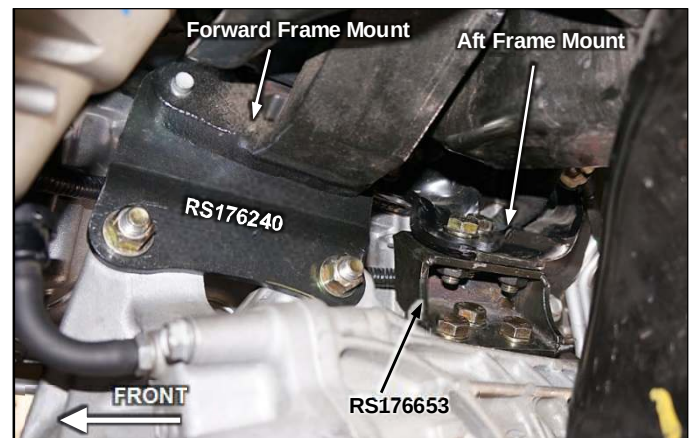


Illustration 21

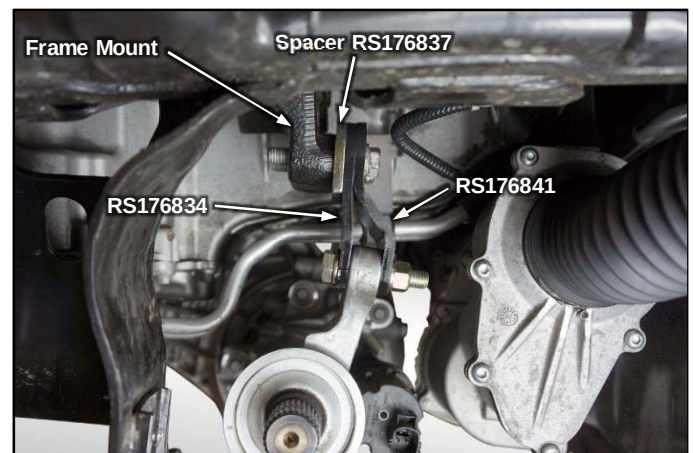


Illustration 22

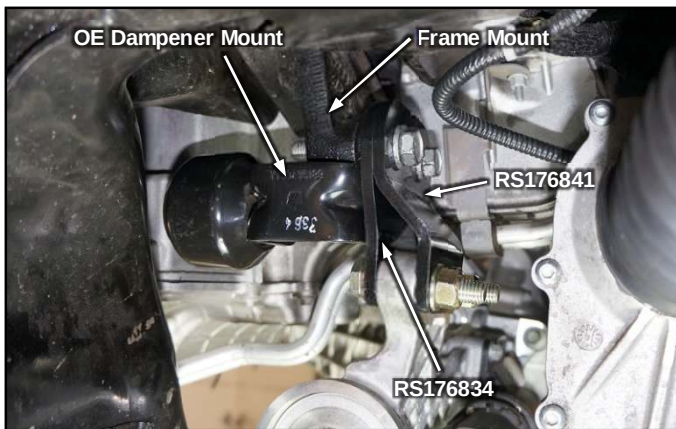


Illustration 23

DRIVESHAFT SPACER INSTALLATION

- 1) ☐ Align marks on front driveshaft and pinion flange.
- 2) ☐ Install driveshaft spacer RS176835 between pinion flange and driveshaft using hardware from kit RS860822 and threadlock. The raised surface of the spacer fits into the recess of the flange. Torque to 55 ft. lbs. See Illustration 24.

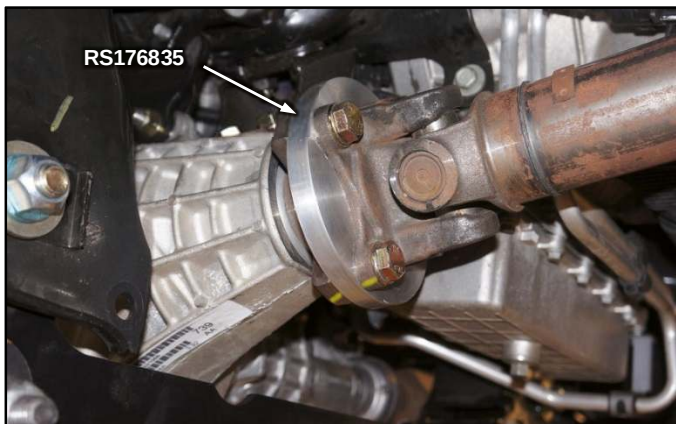


Illustration 24

SUB-FRAME INSTALLATION

- 1) ☐ With an assistant's help, raise sub-frame RS176588B up into the lower control arm frame brackets. See Illustration 25.



Illustration 25

- 2) ☐ Attach the sub-frame with the hardware from kit RS860562. Install a small washer and centering plate RS176421 on each rear bolt. Insert all bolts from front to back. See Illustration 26.

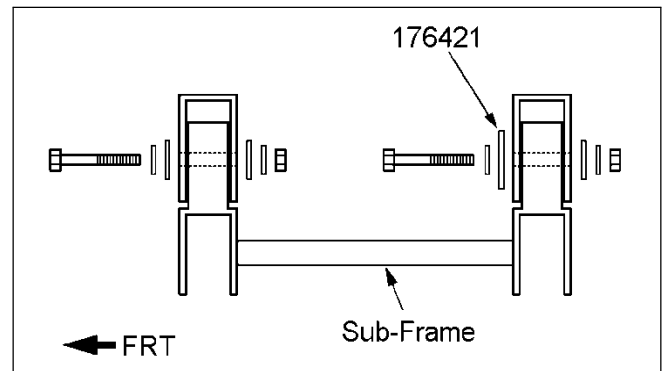


Illustration 26

- 3) Tighten the sub-frame nuts and bolts to 155 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 27.

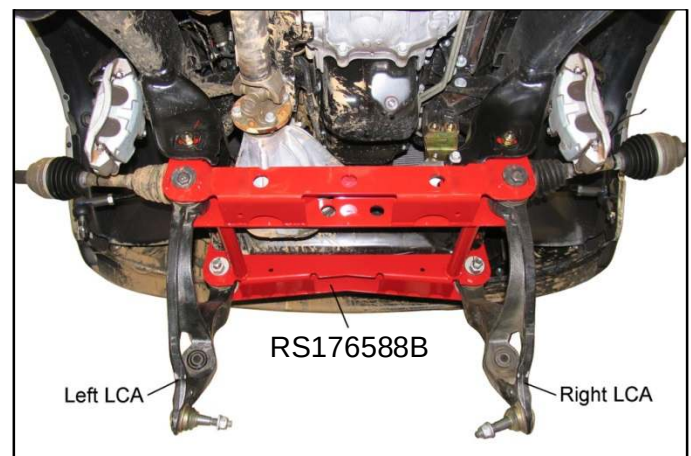


Illustration 27

- 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 lower spring seat and OE jounce bumper on new Rancho shock absorber according to instructions supplied with shock absorber.

7) ☐ Insert shock assembly into coil spring. Install OE isolator and mounting plate. See Illustration 28. Align reference marks and install upper nut. Tighten nut to 45 ft. lbs.

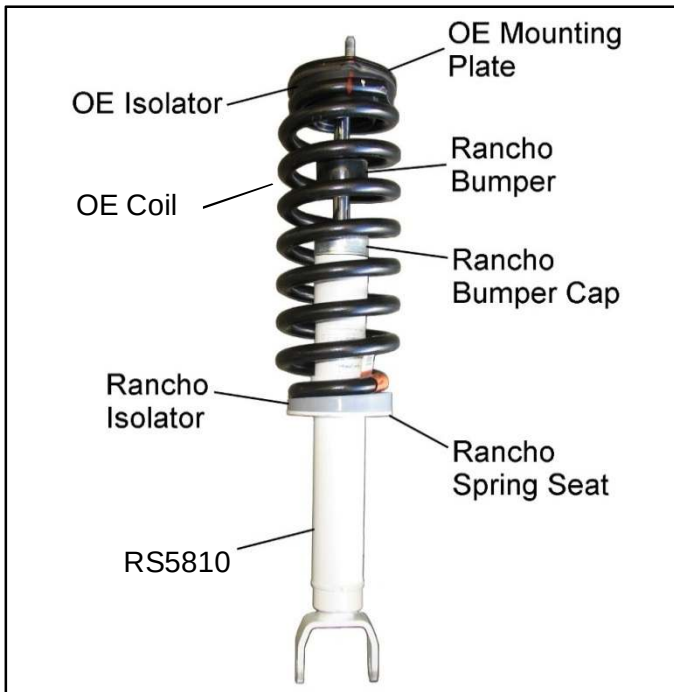


Illustration 28

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

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

10) ☐ Insert the top of the right coil over assembly into the passenger side frame bracket. Loosely attach coil over to bracket with the original nuts.

11) ☐ Loosely attach the bottom of the coil over to the lower control arm with the original hardware. Insert bolt from back to front, but do not tighten.

12) ☐ Torque upper shock mounting nuts to 45 ft. lbs.

STEERING KNUCKLE INSTALLATION

1) ☐ 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 29.

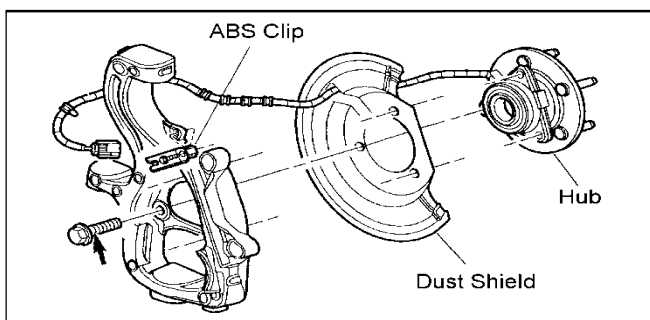


Illustration 29

2) ☐ Attach dust shield, hub and ABS line (use tie-wrap) to right steering knuckle RS176231. 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.

3) ☐ Install axle hub spacer RS176232 on the passenger side axle shaft. See Illustration 30.

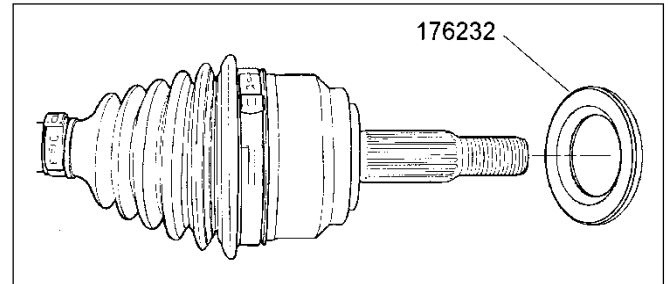


Illustration 30

4) ☐ Support the lower control arm with a jack. Insert axle shaft through hub and install steering knuckle RS176231 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.



Illustration 31

5) ☐ Insert the upper ball joint into the knuckle. Install upper ball joint nut. See Illustration 31.

6) ☐ Tighten the upper ball joint nut to 75 ft. lbs. Tighten the lower ball joint nut to 110 ft. lbs.

7) ☐ Install the axle shaft hub nut and tighten to 185 ft. lbs.

8) ☐ Attach outer tie rod end to steering knuckle with the original nut. Tighten ball stud nut to 50 ft. lbs. Tighten the jam nut to 94 ft. lbs.

9) ☐ Repeat steps 1 through 10 to install the left coil over and steering knuckle RS176230 on the driver side.

10) ☐ 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.

END LINK EXTENDER INSTALLATION

- 1) ☐ Apply thread lock to the original end link. Attach end link extender RS176419 to end link. See Illustration 32. Tighten extender securely.
- 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 155 ft. lbs. Tighten the lower shock mounting bolts to 155 ft. lbs.



Illustration 32

REAR SUSPENSION

SHOCK ABSORBER & COIL SPRING REMOVAL

- 1) ☐ Chock front wheels.
 - 2) ☐ Remove the bolt and nut holding the track bar to the rear axle.
 - 3) ☐ Remove the bolt and nut holding the sway bar end links to the frame.
 - 4) ☐ Raise the rear of the vehicle and support the frame with jack stands. Remove rear wheels.
 - 5) ☐ Support the rear axle assembly with a floor jack.
 - 6) ☐ Remove the upper and lower shock mounting bolts. Remove shock absorber.
- NOTE: It may be necessary to remove fender well liner screws and pull liner out to assess and remove upper shock mounting bolt. Use a 21mm crowfoot wrench and extensions to hold nut from spinning.
- 7) ☐ Remove brake line wire hanger from frame, and ABS cable from holders.
 - 8) ☐ Repeat step 6 and 7 for other side.
 - 9) ☐ Carefully lower the rear axle. Do not allow the axle to hang by any hoses or ABS cables.

⚠ WARNING: Do not allow the axle to hang by any hoses or ABS cables. You could damage the hoses or ABS cables, without this damage being visible to you, resulting in sudden and unexpected failure of a hose or ABS system, and an accident.

- 10) Remove both coil springs and insulators from vehicle.

BUMP STOP SPACER 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 55 ft. lbs. See Illustration 33.



Illustration 33

- 3) ☐ Repeat steps 1 & 2 for passenger side.

COIL SPRING AND SHOCK ABSORBER INSTALLATION

- 1) ☐ 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 34.



Illustration 34

- 2) ☐ Attach new Rancho shock absorbers to the upper and lower mounts. Torque to 100 ft. lbs.
- 3) ☐ Repeat steps 4 and 5 for passenger side.

BRAKE LINE / SWAY BAR BRACKET INSTALLATION

- 1) ☐ Install brake line/sway bar drop bracket RS176698 to frame using OE brake line mounting bolt and M12 hardware from kit RS860730. Torque OE bolt to 18 ft. lbs. and M12 hardware to 55 ft. lbs.
- 2) ☐ Attach sway bar end links to drop bracket RS176698 using OE hardware. Torque to 55 ft. lbs
- 3) ☐ Attach brake-line wire hanger to drop bracket RS176698 using supplied M8 hardware from kit RS860730. Torque to 18 ft. lbs.
- 4) ☐ Reattach ABS cable using supplied tie wraps. See Illustration 35.

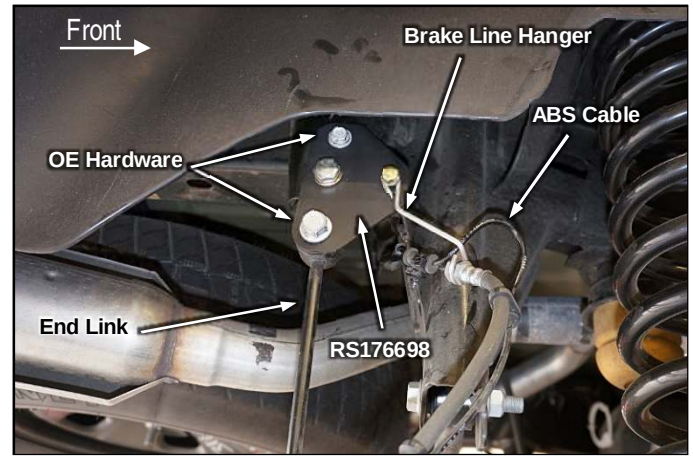


Illustration 35

- 5) ☐ Install rear wheels and lower vehicle to ground. Tighten lug nuts to 130 ft. lbs.
- 6) ☐ Reinsert original track bar bolt into axle bracket. Tighten to 110 ft. lbs. See Illustration 36.



Illustration 36

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.
- 5) ☐ 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): $.1^{\circ} \pm .1^{\circ}$

TRIM INNER TIE ROD (IF REQUIRED)

NOTE: On some models it may be necessary to shorten the tie rod to adjust toe to specifications.

- 1) ☐ Refer to step four of the section "STEERING KNUCKLE REMOVAL" (page 7) to remove outer tie rod end.
- 2) ☐ Keep lock nut on inner tie rod and cut 1/4" – 3/8" off of end of inner tie rod using a cutoff wheel. De-burr after cutting. See Illustration 37



Illustration 37

3) ☐ Re-attach outer tie rod end RS602614 to tie rod RS602641. As reference leave a .45 gap between jam nut and tie rod end. Refer back to Illustration 12.

4) ☐ Attach outer tie rod end to steering knuckle with the original nut. Tighten ball stud nut to 50 ft. lbs. Tighten the jam nut to 94 ft. lbs.

FINAL MEASUREMENT

1) ☐ Park the vehicle on a level surface Measure and record the distance from the center of each wheel to the top of the fender opening. See Illustration 38.

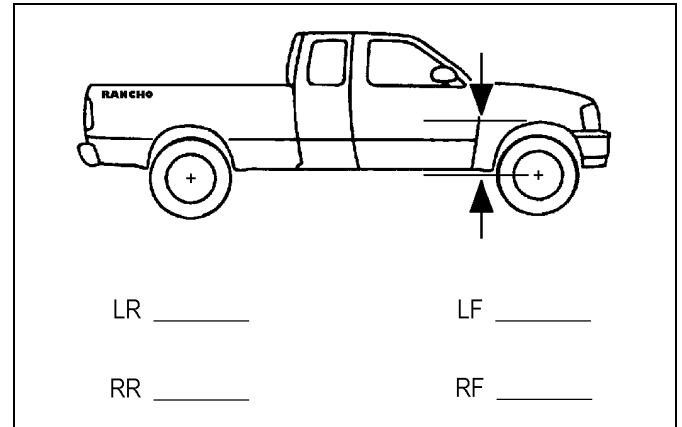


Illustration 38

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

Torque Specs

Front Components

Caliper Brake Hose Banjo Bolt	20 ft. lbs.
Brake Hose Fitting (at frame)	14 ft. lbs.
Brake Line Frame Clip	7.5 ft. lbs.
Differential Mounts	70 ft. lbs.
Front Driveshaft	55 ft. lbs.
Sub-Frame	155 ft. lbs.
Shock Absorber Rod Nut	45 ft. lbs.
Shock Absorber Upper Mount (to frame)	45 ft. lbs.
Shock Absorber Lower Mount (to control arm)	155 ft. lbs.
Hub Bolts	120 ft. lbs.
Upper Ball Joint	75 ft. lbs.
Lower Ball Joint	110 ft. lbs.
Outer Tie Rod End (to knuckle)	50 ft. lbs.
Outer Tie Rod End Jam Nut	94 ft. lbs.
Inner Tie Rod (to rack)	125 ft. lbs.
Axle Nut	185 ft. lbs.
Brake Caliper (to knuckle)	130 ft. lbs.
Sway Bar End Link Bushing nut	20 ft. lbs.
Lower Control Arm	155 ft. lbs.
Wheel Lug Nuts	130 ft. lbs.

Rear Components

Bump Stop Spacer RS176589	55 ft. lbs.
Shock Absorber Upper Mount	100 ft. lbs.
Shock Absorber Lower Mount	100 ft. lbs.
Brake Line/Sway Bar bracket RS176698 – M8 Hardware	18 ft. lbs.
Brake Line/Sway Bar bracket RS176698 – M12 Hardware	55 ft. lbs.
Sway Bar End Link Upper Mount	55 ft. lbs.
Track Bar	110 ft. lbs.
Wheel Lug Nuts	130 ft. lbs.

STANDARD BOLT TORQUE & IDENTIFICATION

INCH SYSTEM			METRIC SYSTEM			
Bolt Size	Grade 5	Grade 8	Bolt Size	Class 8.8	Class 10.9	Class 12.9
5/16	15 LB-FT	20 LB-FT	M6	5 LB-FT	9 LB-FT	12 LB-FT
3/8	30 LB-FT	35 LB-FT	M8	18 LB-FT	23 LB-FT	27 LB-FT
7/16	45 LB-FT	60 LB-FT	M10	32 LB-FT	45 LB-FT	50 LB-FT
1/2	65 LB-FT	90 LB-FT	M12	55 LB-FT	75 LB-FT	90 LB-FT
9/16	95 LB-FT	130 LB-FT	M14	85 LB-FT	120 LB-FT	145 LB-FT
5/8	135 LB-FT	175 LB-FT	M16	130 LB-FT	165 LB-FT	210 LB-FT
3/4	185 LB-FT	280 LB-FT	M18	170 LB-FT	240 LB-FT	290 LB-FT

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



Rancho Technical Department 1-734-384-7804.