



Rancho Suspension Systems:

RS66308B — Fits vehicles equipped with factory forged steel upper control arm

RS66309B — Fits vehicles equipped with factory aluminum or stamped steel upper control arm

2017-2014 GMC Sierra / Chevy Silverado 1500 4WD

NOT COMPATIBLE WITH 6.2L Engine, or Z95 Magnetic Ride Control

Stamped steel upper control arms NOT COMPATIBLE with OE wheels.

RS66309B NOT COMPATIBLE with aftermarket lower ball joints.

Front Driveshaft Replacement Recommended.

See page 4 for specifications, requirements and compatibility.



Shown With:
BF Goodrich® All-Terrain T/A® KO2 LT285/65R20 Tires
Vision Arc 20" X 9" +12 offset wheels

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: LT285/65R20 Tires, 20 x 9 x 5.5 Backspacing Rim

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 8 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

Compatibility

ATTENTION: RS66308B and RS66309B are not compatible with vehicles equipped with 6.2L engine (no front driveline available), or Z95 magnetic ride control.

RS66309B is not compatible with aftermarket lower ball joints – Replacement aftermarket lower ball joints that add thickness to the top of the lower control arm will contact half-shaft.

Before installing, make sure you have the correct kit.

Your truck came from the factory with one of three control arms installed.:

Use Kit RS66308B for vehicles equipped with black forged steel.

Use Kit RS66309B for vehicles equipped with silver forged aluminum.

or
black stamped steel*

***NOTE: OE wheels not compatible with stamped steel control arms**



Aluminum

Stamped Steel

Forged Steel

Shock Absorbers

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

Do not reuse OE shock absorbers, except with front shock spacer RS176827

⚠️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
OE With	RS999297
Shock Spacer	RS7297
RS176827*	RS55297

*FOR OE GMC SHOCK ONLY

Wheels and Tires

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

Tire: BF Goodrich® All-Terrain T/A® KO2 LT285/65R20

Wheel: 20" X 9" +12 offset wheel with 5.5" of backspacing.

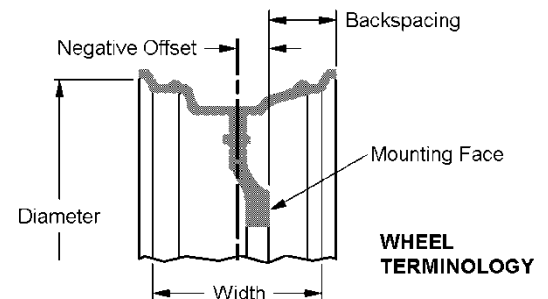
Total backspacing 6.0" — Maximum total backspacing is 6.5"

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

Control Arms	Compatible With OE Wheels	Development Tire Size (Actual)	Wheel Size (Backspacing)
Aluminum or Forged Steel	Yes ¹ 17" wheel and up only	LT285/65R20 (34.5"x11.5")	20x9 (5.5")
Stamped Steel	NO	LT285/65R20 (34.5"x11.5")	20x9 (5.5")

¹ OE wheels and spare compatible with stock size tires only.

² Fitment of the optional tire size may require trimming to provide proper clearance.



WHEEL TERMINOLOGY

Recommended Components and Modifications (MUST BE PURCHASED SEPARATELY)

If front driveline vibration is present, replace front driveshaft with Powertrain Industries double cardan front driveshaft P/N 3194-9827. (Fits 5.3L V8 Automatic Only)
Consult driveshaft suppliers for other models

Rancho recommends Powertrain Industries drives shafts:

Powertrain Industries, Garden Grove, CA.
1-800-798-4585.

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

GMC / Chevrolet Service Manual
Heavy Duty Jack Stands
Wheel Chocks (wooden blocks)
Hydraulic Floor Jack
Kent-Moore Puller J-24319-B
Kent-Moore J-42188-B Ball Joint Separator
Kent-Moore Ball Joint Separator Tool J-43631
Kent-Moore Adapter J-45851
Die Grinder

Drill motor
Assorted Drills: 1/8" through 1/2"
Torque Wrench (250 FT-LB capacity)
1/2" Drive Ratchet and Sockets
Assorted Combination Wrenches
Center punch
File
Reciprocating Saw (to modify frame)
Hammer

Wire Brush (to clean bracket mounting surfaces)
Silicone Spray Lubricant
Grease Gun with NLGI 2 GC-LB Lithium Base Grease
Tape Measure
Safety Glasses--
Wear safety glasses at all times

Box 1 of 5



ITEM	PART #	DESCRIPTION	QTY
	RS66308B-1 RS66309B-1	Box 1 of 5	1
1	RS176819B	Subframe	1

Box 3 of 5



ITEM	PART #	DESCRIPTION	QTY
	RS66308B-3	Box 3 of 5	1
11	RS176475	Left Knuckle, Replaces Steel	1
12	RS176476	Right Knuckle, Replaces Steel	1
	RS66309B-3	Box 3 of 5	1
11	RS176824	Left Knuckle, Replaces Aluminum	1
12	RS176825	Right Knuckle, Replaces Aluminum	1
	RS176826	Lower Ball Joint Spacer	2

Box 2 of 5

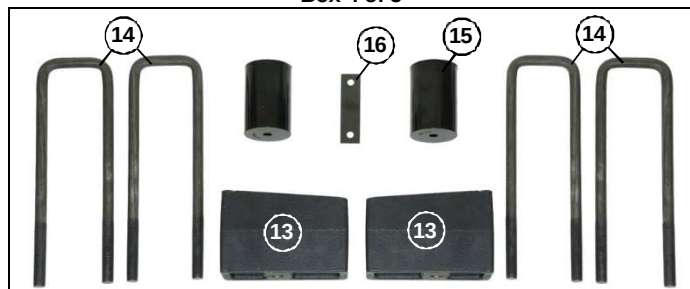


ITEM	PART #	DESCRIPTION	QTY
	RS66308B-2 RS66309B-2	Box 2 of 5	1
	RS860546	Sub Assy, Subframe	1
	RS770040	HHCS, M16-2.0X140	2
	RS7861	Washer, M16	8
	RS770030	Nut, M16-2.00 Top Lock	4
	RS770140	HHCS, M16-2.00X120	2
2	RS176579	Sway Bar Drop Bracket	2
	RS860547	Sub Assy, Sway Bar Bracket	1
	RS770080	HHCS, M10-1.50X30	4
	RS770064	Washer, M10	12
	RS7657	Nut, M10-1.50 Nylock	4
	RS7658	HHCS, M10-1.50X60	4
	RS770095	1/2" Loop Strap	2
	136763624	Tie Strap	4
	RS42702	Thread Lock - Red	2
3	RS176820	Diff Drop Bracket -Left	1

Box 2 of 5 (continued)

4	RS176821	Diff Drop Bracket - Right	1
	RS860550	Sub Assy, Front Diff Hardware	1
	RS770120	HHCS, M12-1.75X50	4
	RS7915	Washer, M12	8
	RS7911	Nut, M12-1.75 Top Lock	4
	RS7719	Washer, 1/2 USS	2
	RS860825	Sub Assy, Front Right Diff Hardware	1
	RS740019	U-Bolt 1/2"	1
	RS7722	Nut, 1/2" Nylock	2
	RS7723	Washer, 1/2" SAE	2
5	RS176822	Differential Torque Bracket	1
	RS860821	Sub Assy, Torque Bracket	1
	RS770284	HHCS, M10-1.50X75MM	3
	RS770064	Washer, M10	3
	RS420072	Sleeve, .750 X .09 X 2.735	1
	RS520041	Bushing	2
	RS603616	HHCS, 1/2-13 X 4.0	1
	RS78361	Nut 1/2-13 Top Lock	1
	RS7723	Washer, 1/2 SAE	2
6	RS176715	Brake Line Bracket, Left Front	1
7	RS176716	Brake Line Bracket, Right Front	1
	RS860738	Sub Assy, Brake Line Bracket	1
	RS7906	HHCS, 1/4-20 x 1.0	4
	RS77841	Washer 1/4 SAE	8
	RS7710	Nut, 1/4-20 Nylock	4
8	RS176235	Axle Spacer	2
	RS860176	Sub Assy, Axle Spacer	1
	RS7634	Washer, 3/8 AN960-616	12
	RS7658	HHCS, M10-X1.50X60	12
9	RS176823	Skid Plate	1
	RS860739	Sub Assy, Skid Plate	1
	RS770080	HHCS, M10-1.50X30	4
	RS770064	Washer, M10	8
	RS7657	Nut, M10-1.50 Nylock	4
10	RS602617	Tie Rod End	2
	RS89308	Instruction	1
	RS94180	Information Pack	1
	RS94177	Rollover Warning Label	1
	RS94119	Consumer/Warranty Information	1
	RS780281	Rancho Decal	1
	R-RM0082-1112	Warranty Tag	1

Box 4 of 5



ITEM	PART #	DESCRIPTION	QTY
	RS66308B-4 RS66309B-4	Box 4 of 5	1
13	RS15114	Block, 4"	2
14	RS740014	U-Bolt, 9/16-18 X 2.56 X 12.5	4
	RS8102	Sub Assy 9/16 U-Bolt	1
	RS7737	Nut, 9/16-18 Nylock	8
	RS7738	Washer, 9/16 SAE	8
	RS8051	Sub Assy, 5/8" Pin	1
	RS10490	Pin .625 X .875	2
15	RS176477	Rear Bumpstop Spacer	2
	RS860582	Sub Assy, Rear Bumpstop	1
	RS770157	SHCS, M10-1.5X110 (Allen)	2
	RS770081	HHCS, M8-1.25X10	1
	RS603508	Washer, 3/8 SAE	2
	RS603525	Lockwasher, M10	2
	RS860750	Sub Assy, Rear Brake Bracket	1
	RS7698	HHCS, 5/16-18 X 1.25	1
	RS7712	Nut, 5/16-18 Toplock	1
	RS7642	Washer, 5/16 SAE	2
16	RS176722	Rear Brake Line Bracket	1

Box 4 of 5

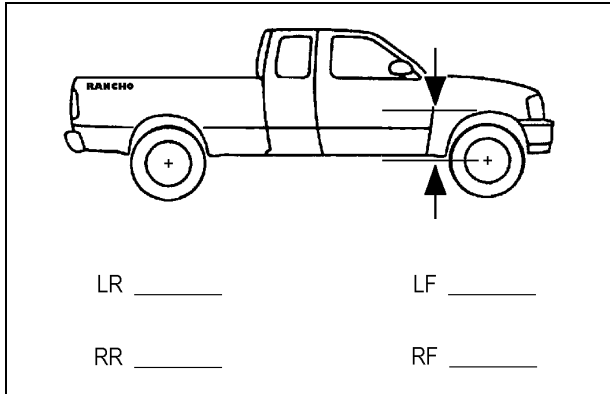


ITEM	PART #	DESCRIPTION	QTY
	RS66308B-5 RS66309B-5	Box 5 of 5	1
17	RS176827	Shock Spacer	2
	RS860746	Hardware Kit - Shock Spacer	1
	RS770260	Nut, 7/16-20 Nylock	6
	RS7726	Washer, 7/16 SAE	12
	RS780290	Rancho Decal 1" X 2.75"	2



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. Record these measurements in the space provided below.



- 2) ☐ Disconnect the sway bar from the lower control arms. Save end links for reuse.
- 3) ☐ Raise the front of the vehicle and support the frame with jack stands. Remove the front wheels and set them aside.
- 4) ☐ If applicable, remove the front skid plate and cross member braces.
- 5) ☐ Remove the sway bar frame bracket bolts. Remove the sway bar.

STEERING KNUCKLE, SHOCK ABSORBER, HALF SHAFT (4WD ONLY), & LOWER CONTROL ARM REMOVAL

- 1) ☐ Remove ABS sensor wire clips from the upper control arm and frame. Separate the ABS sensor wire plug at the frame. Remove the brake hose / ABS wire bracket from the frame and upper control arm, save bolt. See Illustration 1.

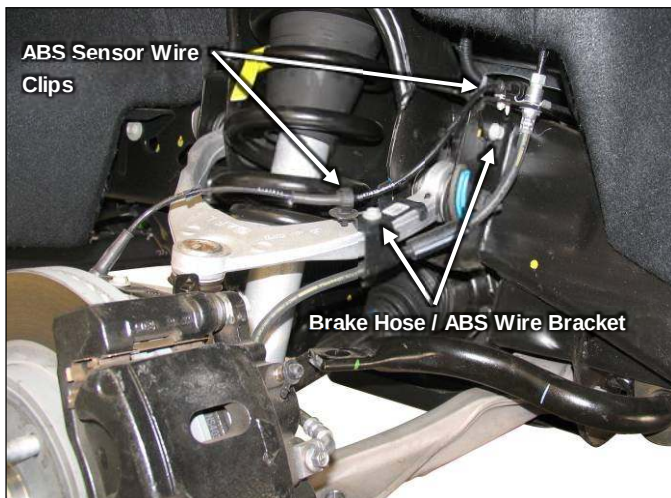


Illustration 1

NOTE: For vehicles equipped with Electronic Suspension Control (Auride), separate brake hose from sensor link bracket.

- 2) ☐ Remove the brake caliper anchor bolts. Remove the brake caliper and its mounting bracket as an assembly. Hang the caliper assembly with wire or a tie wrap. See Illustration 2.

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.

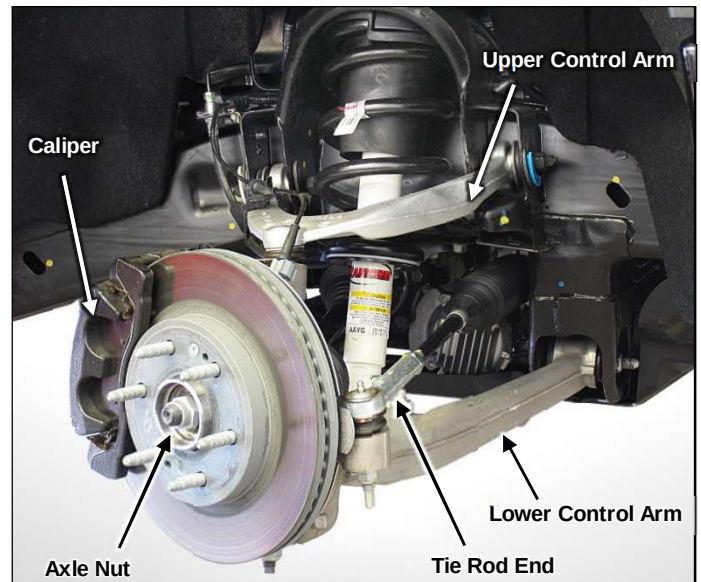


Illustration 2

- 3) ☐ Label the brake rotor left or right. Remove rotor attachment torx screw. Remove the brake rotor.
- 4) ☐ Remove hub dust cap carefully using a small chisel and hammer to separate the edge of the cap from the hub. Work around the outer edge of the cap where it meets the hub.
- 5) ☐ Remove the axle nut using a 36mm socket.

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.

- 6) ☐ Loosen tie rod jam nut.
- 7) ☐ Remove the nut from the outer tie rod ball stud. Using Kent-Moore Puller J-24319-B, separate tie rod stud from knuckle.
- 8) ☐ Loosen the nuts at the upper ball joint. Using Kent-Moore J-42188-B Ball Joint Separator, separate ball joints from knuckle.
- 9) ☐ Loosen the nuts at the upper and lower ball joints. Using Kent-Moore Ball Joint Separator Tool J-43631 and J-45851 Adapter, separate ball joints from knuckle.

10) ☐ Remove the upper and lower ball joint nuts. Carefully remove the steering knuckle.

11) ☐ Index mark the half shaft and front differential flange for installation reference. Illustration 3.

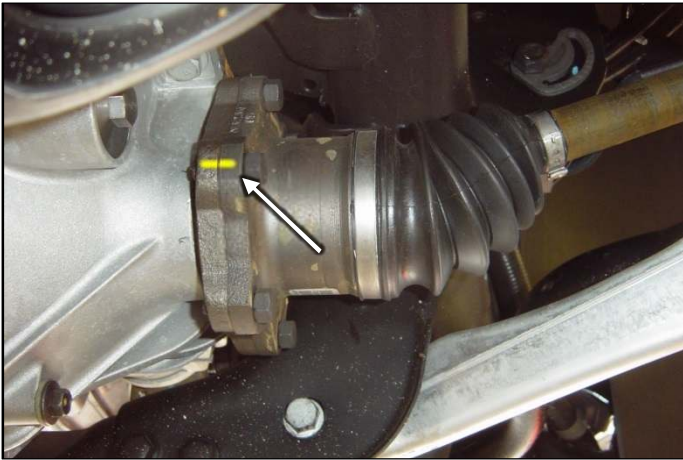


Illustration 3

12) ☐ Remove the half shaft flange bolts. Remove the half shaft.

13) ☐ Index-mark the shock absorber upper mount, coil spring, and lower mount on the outward facing side. Disconnect Electronic Suspension Control connector if applicable.

14) ☐ Remove the shock absorber lower bolts. Remove the three shock absorber upper mount to frame nuts. Remove the shock absorber and spring assembly.

15) ☐ Remove the lower control arm pivot bolts. Remove the lower control arm.

16) ☐ Repeat steps 1 through 15 for the other side.

FRONT DIFFERENTIAL REMOVAL (4WD ONLY)

1) ☐ Remove the four bolts that attach the cross member to the lower control arm rear pockets. Remove the cross member. See Illustration 4.

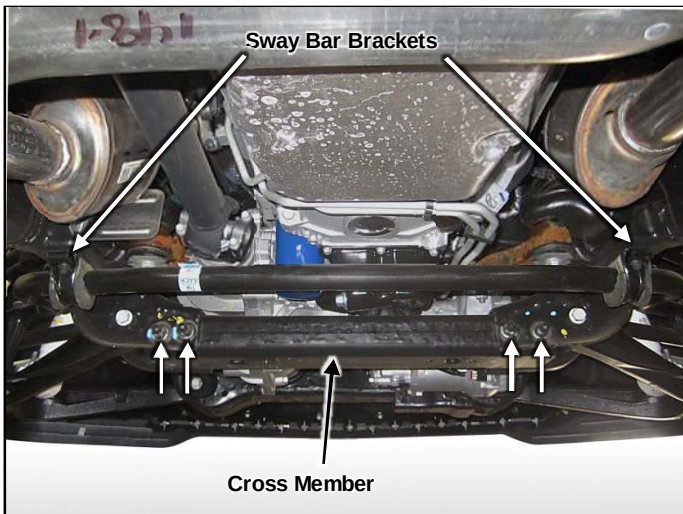


Illustration 4

2) ☐ Using a reciprocating saw or cutoff wheel, cut off the driver side cross member bracket 3.5" from the inside edge. See Illustration 5. File or grind sharp edges and paint exposed metal. Repeat for passenger side cross member bracket.

NOTE: Frame coating can be removed with a putty knife and solvent such as mineral spirits.

⚠ 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.

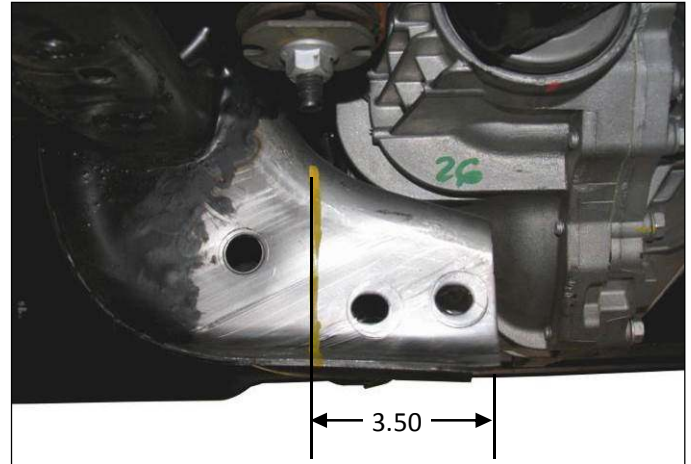


Illustration 5

3) ☐ Reference mark the front driveshaft U-joint to the differential yoke. Remove the four bolts and two retainers from the yoke and slide the shaft rearward to disengage. Tape the bearing cap assemblies and secure the shaft out of the way. See Illustration 6.

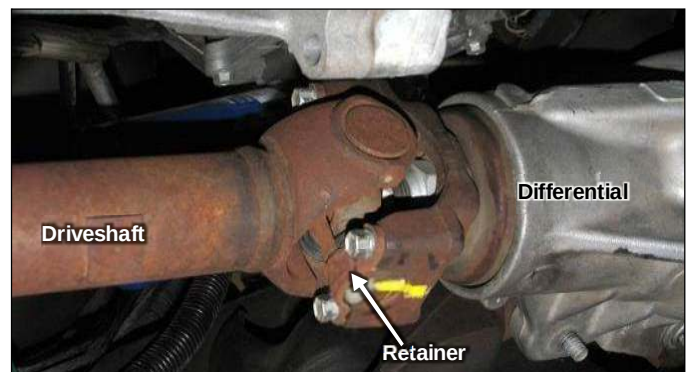


Illustration 6

4) ☐ Disconnect the electrical connector from the solenoid on the passenger side of the differential. Disconnect the wiring harness clip from the top, and the vent hose from the driver side of the differential assembly. See Illustration 7 and Illustration 9.

5) ☐ Support the front differential assembly with adjustable jack stands or floor jack.



Illustration 7

7) ☐ Remove the two passenger side mounting nuts at the axle tube (Illustration 8) and two driver side mounting bolts from the differential housing (Illustration 9). Carefully lower and remove the front differential.

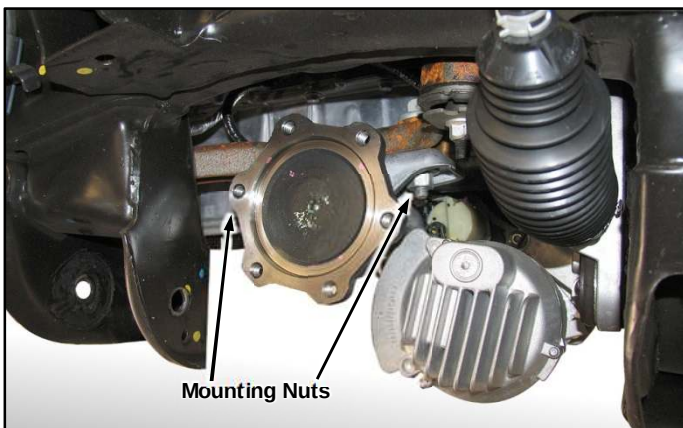


Illustration 8

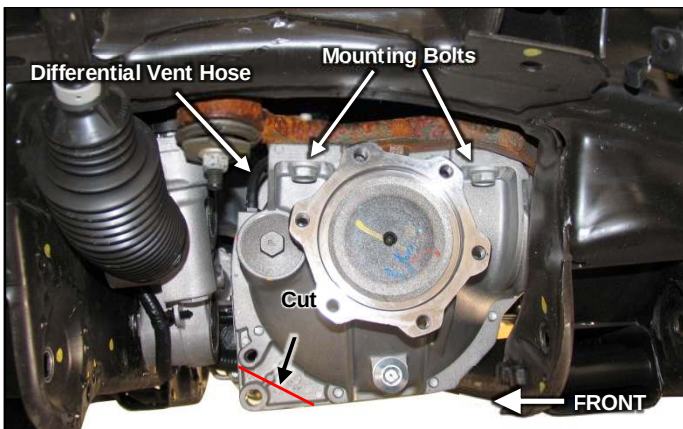


Illustration 9

NOTE: The rear of the differential will have to be tilted down to clear the steering rack.

⚠ WARNING: Do not damage the differential solenoid, or the steering rack plugs. You could damage the harness or plugs, without this damage being visible to you, resulting in sudden and unexpected steering failure and an accident.

FRONT DIFFERENTIAL DROP BRACKET INSTALLATION (4WD ONLY)

Box RS66308B-2 or RS66309B-2 (Box 2 of 5)

Left Diff Drop Bracket RS176820

Right Diff Drop Bracket RS176821

Hardware from Sub Assy RS860550

Hardware from Sub Assy RS860825

1) ☐ Using a reciprocating saw or cutoff wheel, cut off the front lower flange of the differential. See Illustration 9 and Illustration 10. File or grind sharp edges.

CAUTION: When modifying the front differential, do not cut into the case itself.

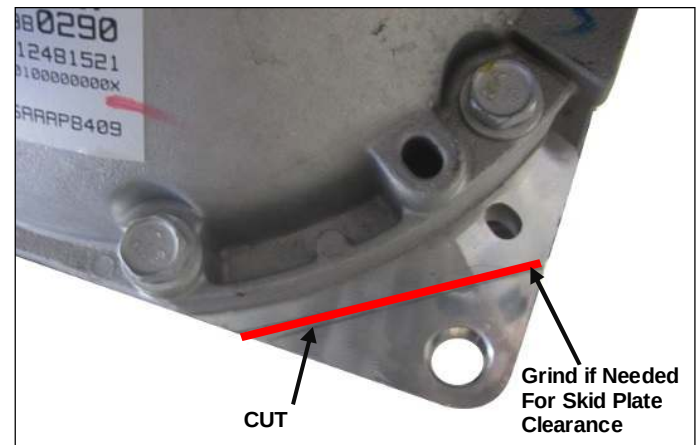


Illustration 10

2) ☐ Using a reciprocating saw or cutoff wheel, cut off the front section of the passenger side axle tube mount. File or grind sharp edges. See Illustrations 11, 12, 13.

CAUTION: When modifying the front axle, do not cut into the axle tube itself.

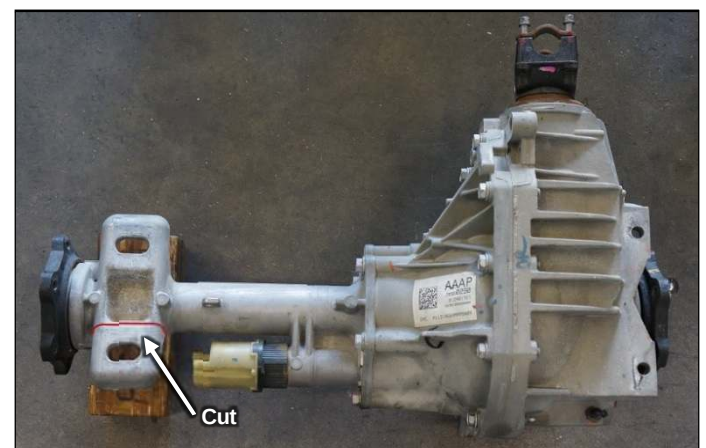


Illustration 11



Illustration 12



Illustration 13

3) ☐ Loosely attach right drop bracket RS176821 to the passenger side differential frame mount with the original hardware. See Illustration 14.

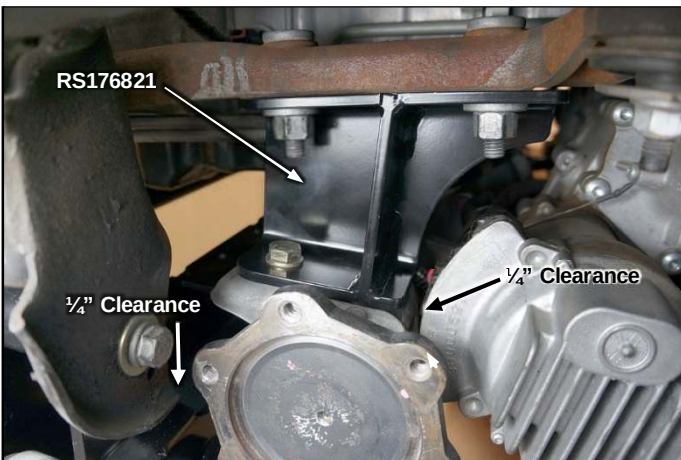


Illustration 14

4) ☐ Loosely attach left drop bracket RS176820 to the driver side differential frame mount with the original hardware. See Illustration 15.



Illustration 15

5) ☐ With the help of an assistant, loosely attach the front differential to the installed drop brackets with the hardware from kit RS860550. Refer to Illustration 14 and Illustration 15. Install the larger USS washers on the passenger side axle tube mount slot.

6) ☐ Loosely attach passenger side axle tube to drop bracket RS176821 using 1/2 inch U-Bolt from kit RS860825. See Illustration 16.

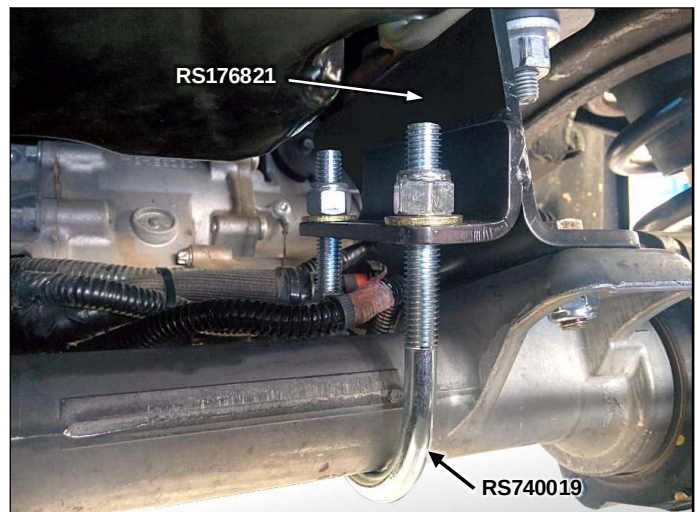


Illustration 16

SUBFRAME INSTALLATION

Box RS66308B-1 or RS66309B-1 (Box 1 of 5)

Subframe RS176819B

1) ☐ Cut 15 3/8 inch off the rear of the front skid plate. See Illustration 17 Trim the forward section using the lines of the skid plate as a guide as shown in Illustration 18.

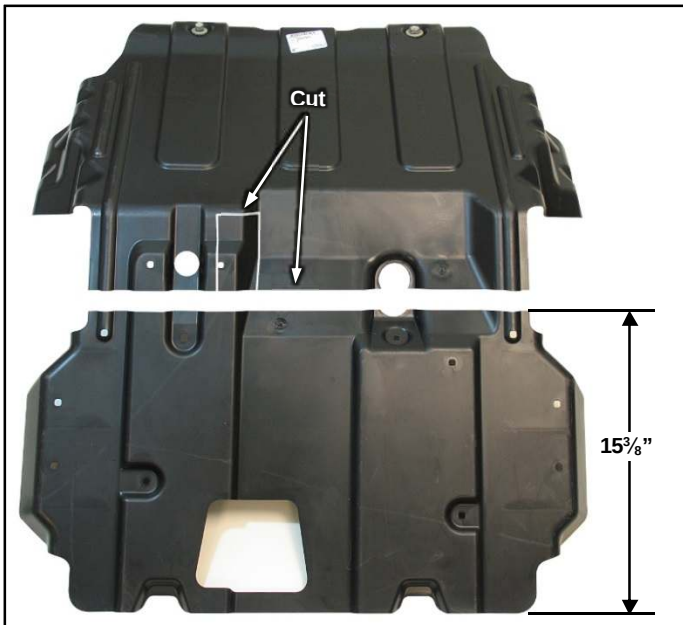


Illustration 17

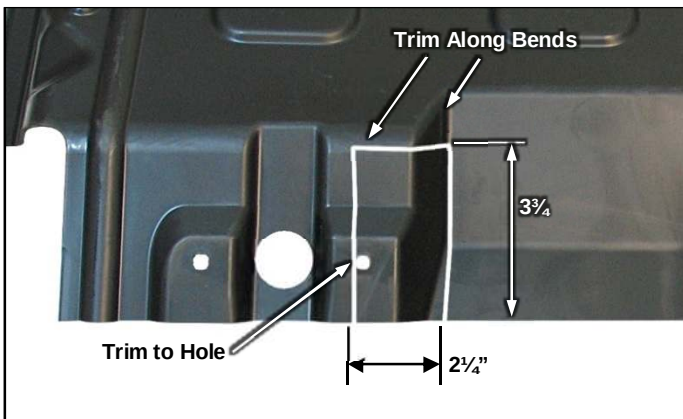


Illustration 18

2) ☐ Attach the front of the skid plate using OE hardware. The cut end will be held in place by the subframe RS176819B. Do not re-install metal cross-braces.

3) ☐ With the help of an assistant, raise the subframe RS176819B up into the lower control arm frame brackets. Attach the subframe to the brackets with the original hardware. Insert the bolts from the front. Install OE cone washer under nut. See Illustration 19. Push up on the subframe and torque the mounting bolts to 107 lb-ft.

NOTE: If subframe contacts corners of front control arm frame brackets enlarge the inside corners using a round file or die grinder, See Illustration 20. Trim skid plate more if necessary.



Illustration 19



Illustration 20

DIFFERENTIAL INSTALLATION

Box RS66308B-2 or RS66309B-2 (Box 2 of 5)

Diff Torque Bracket RS176822

Hardware from Sub Assy RS860821

Hardware from Sub Assy RS860748

1) ☐ Install two bushings (RS520041) from sub assy RS860821 into differential torque bracket RS176822. Apply silicon lubricant and press sleeve RS420072 through the installed bushings.

2) ☐ Remove the 3 case bolts from the front of the differential. See Illustration 21.

NOTE: After removing the bolts, oil may seep from the case. Do not stop installation at this point.

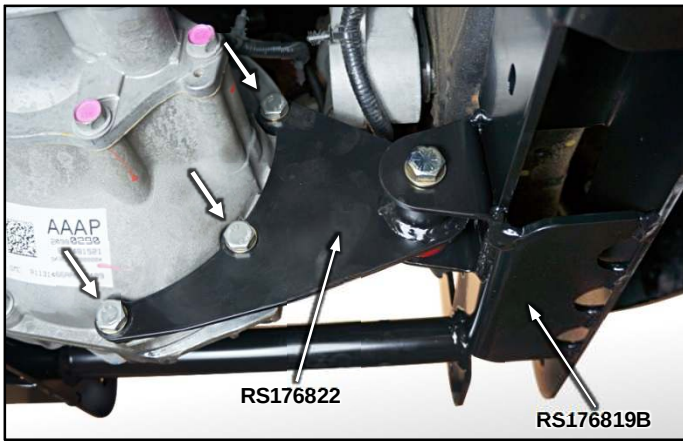


Illustration 21

- 3) ☐ Position bushings of differential torque bracket RS176822 in mount of subframe RS176819B.
- 4) ☐ Attach differential torque bracket RS176822 to the front differential with the 10mm hardware from kit RS860821. Use thread lock on bolts. Snug bolts to about 10 lb-ft.
- 5) ☐ Attach differential torque bracket RS176822 to subframe with 1/2" hardware from kit RS860821. Torque to 90 lb-ft.
- 6) ☐ Snug bolts attaching driver side diff drop to frame bracket and differential.
- 7) ☐ Snug bolts attaching passenger side diff drop to frame bracket and axle tube mount.
- 8) ☐ Torque bolts holding bracket RS176822 to differential case to 35 lb-ft.
- 9) ☐ Torque driver and passenger side differential drop bracket mounting hardware to 65 lb-ft starting with driver side.
- 10) ☐ Torque U-Bolt on passenger side differential drop bracket to 40 lb-ft.

⚠ WARNING: Verify that the right drop bracket RS176713 or axle tube mount does not contact the steering rack or steering rack electrical connections. See Illustration 14

FAILURE TO PROVIDE CLEARANCE COULD CAUSE DAMAGE TO THE STEERING RACK RESULTING IN SUDDEN AND UNEXPECTED STEERING FAILURE AND AN ACCIDENT.

Verify that the front differential and axle flanges do not contact the frame bracket of the lower control arm. See Illustration 14 and Illustration 15. FAILURE TO PROVIDE CLEARANCE COULD CAUSE DAMAGE TO THE FRONT DIFFERENTIAL ASSEMBLY

- 11) ☐ Extend and install differential vent hose using connector fitting and hose in sub assembly RS860748. See Illustration 22

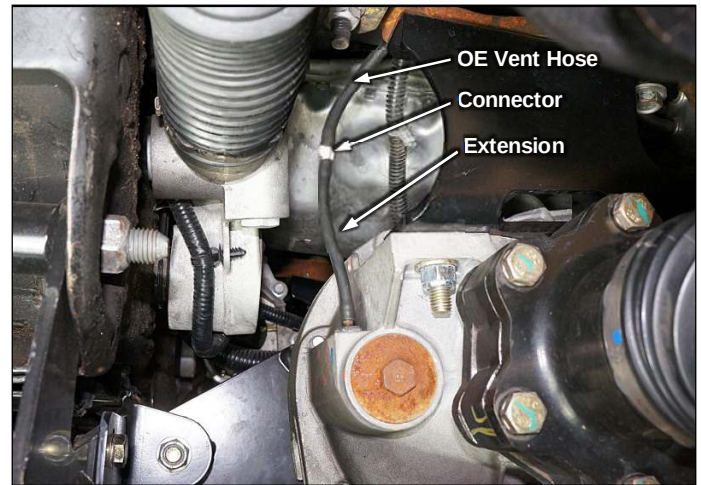


Illustration 22

- 12) ☐ Reattach the differential electrical connector and use wire ties to reattach wiring harness to differential. Refer back to Illustration 7.

SKID PLATE INSTALLATION

 Box RS66308B-2 or RS66309B-2 (Box 2 of 5)

 Skid Plate RS176823

 Hardware from Sub Assy RS860739

- 1) ☐ Install skid plate RS176823 to subframe using 10mm hardware from kit RS860739. See Illustration 23.



Illustration 23

NOTE: Skid plate and differential should have at least 1/4" of clearance. If required, grind differential flange. See Illustration 10. Only grind protruding flange, DO NOT grind into differential housing.

DRIVESHAFT INSTALLATION

If front driveline vibration is present, replace front driveshaft with Powertrain Industries double cardan front driveshaft P/N 3194-9827.

OE Driveshaft Installation:

- 1) ☐ Align reference marks and reattach the front driveshaft U-joint to the differential yoke using OE retainers and bolts. Torque bolts to 22 lb-ft. Blue Locktite is recommended on retainer bolts.

Double Cardan Driveshaft Installation:

- 2) ☐ Loosen the clamp attaching the slip-yoke boot to the transfer case output shaft and slide boot forward off of output shaft.
- 3) ☐ Slide drive shaft slip-yoke forward out of transfer case.
- 4) ☐ If not yet installed, install and clamp boot on new driveshaft slip yoke. Install but do not tighten boot output shaft clamp.
- 5) ☐ Align one of the flat sides of the new driveshaft's center yoke with the transmission linkage cable and slide slip yoke into transfer case output shaft. See Illustration 24.

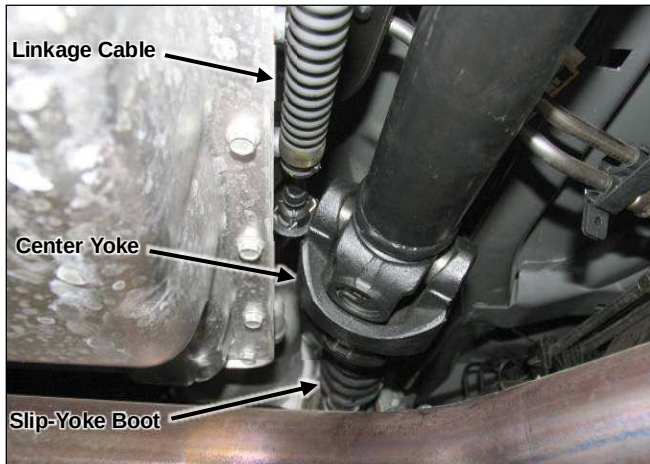


Illustration 24

- 6) ☐ Attach the front driveshaft U-joint to the differential yoke using OE retainers and bolts. Torque bolts to 22 lb-ft. Blue Locktite is recommended on retainer bolts.

LOWER CONTROL ARM AND SHOCK ABSORBER INSTALLATION

-  Box RS66308B-5 or RS66309B-5 (Box 5 of 5)
-  Shock Spacers RS176827
-  Hardware from Sub Assy RS860746
-  Box RS66308B-2 or RS66309B-2 (Box 2 of 5)
-  Hardware from Sub Assy RS860546

- 1) ☐ Using OE nuts, loosely install shock spacer RS176827 onto OE shock absorber. See Illustration 25.



Illustration 25

- 2) ☐ Loosely attach the lower control arms to the subframe with the hardware from kit RS860546. ALL BOLTS MUST GO IN FROM FRONT OF VEHICLE! Refer back to Illustration 19.
- 3) ☐ Loosely attach shock spacer and OE shock assembly to upper shock mount using hardware supplied in kit RS860746.
- 4) ☐ Attach the shock absorber lower mount to the lower control arm with original hardware.
- 5) ☐ Snug all hardware, and then torque upper shock and shock spacer hardware to 33 lb-ft, and lower shock mounting bolts to 44 lb-ft.

HALF SHAFT & STEERING KNUCKLE INSTALLATION

-  Box RS66308B-3 or RS66309B-3 (Box 3 of 5)
-  Driver Side Steering Knuckle RS176475 or RS176824
-  Passenger Side Steering Knuckle RS176476 or RS176825
-  Lower Ball Joint Spacer RS176826 (RS66309B ONLY)
-  Hardware from Sub Assy RS860547

- 1) ☐ Remove the hub, splash guard, and ABS wire from the OE driver side steering knuckle. See Illustration 26.

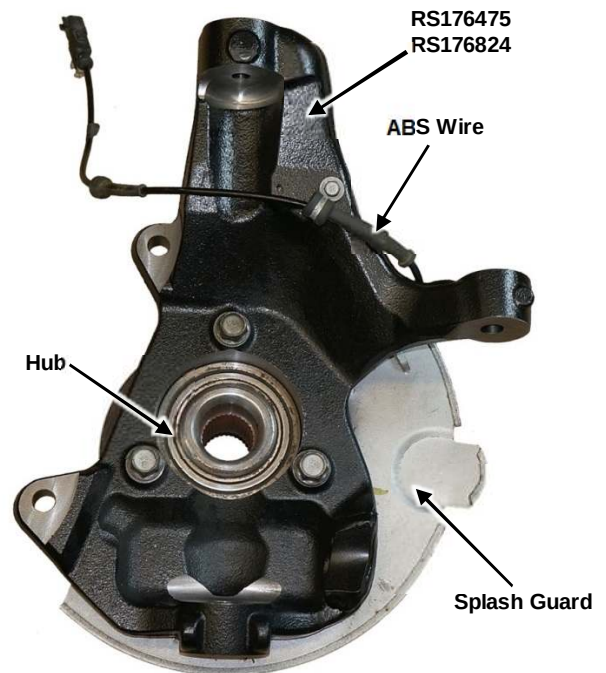


Illustration 26

- 2) ☐ Attach ABS sensor to new Rancho driver side steering knuckle RS176475 or RS176824 with OE bolt.
- 3) ☐ Place splash guard on hub and slide hub into knuckle, making sure not to pinch or deform the ABS wire. Using red thread lock, attach the hub, to steering knuckle with the original hardware. Torque the hub mounting bolts to 133 lb-ft.
- 4) ☐ Attach ABS wire to knuckle with the loop strap from kit RS860547.

- 5) ☐ Loosely attach driver side steering knuckle RS176710 to the lower ball joint with the original hardware.

If installing kit RS66309B, install lower ball joint spacer RS176826 on lower ball joint stud with counter bore (recess) against knuckle. See Illustration 27

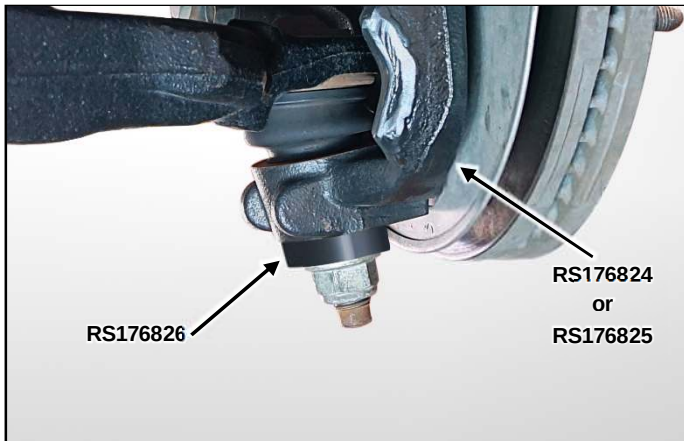


Illustration 27

- 6) ☐ Align splines and insert the half shaft fully into the hub.
- 7) ☐ Swing knuckle up to align with upper ball joint and half shaft to align with axle flange (half shaft can rest on lower control arm).
- 8) ☐ Pull or pry upper control arm down to insert upper ball joint stud through knuckle and loosely attach with OE hardware.
- 9) ☐ Torque the nut on the lower ball joint stud to 74 lb-ft., and the nut on the upper ball joint stud to 37 lb-ft. See Illustration 29.
- 10) ☐ Repeat steps 1 through 7 for passenger side using steering knuckle RS176476 or RS176825.

AXLE SPACER INSTALLATION

 Box RS66308B-2 or RS66309B-2 (Box 2 of 5)

 Axle Spacers RS176235

 Hardware from Sub Assy RS860176

- 1) ☐ Place axle spacer RS176235 against the differential flange. Align flange marks and place the half shaft flange against the spacer. Apply thread lock to bolts and attach the half shaft to the differential with the hardware from kit RS860176. See Illustration 28. Torque the flange bolts to 58 lb-ft.



Illustration 28

- 2) ☐ Install the half shaft washer and nut at the hub. Torque nut to 165 lb-ft.

TIE ROD END INSTALLATION

 Box RS66308B-2 or RS66309B-2 (Box 2 of 5)

 Tie Rod Ends RS602617

 Hardware from Sub Assy RS860176

- 1) ☐ Install supplied grease fitting on new tie rod end RS602617.
- 2) ☐ Remove outer tie rod end from inner tie rod. Leave jam nut on tie rod.
- 3) ☐ Install tie rod end RS602617 on inner tie rod. Leave 1/2" of exposed thread on inner tie rod and snug jam nut and outer tie rod end. See Illustration 29.
- 4) ☐ Attach tie rod end to steering knuckle RS176710 with OE nut. Torque ball stud nut to 33 lb-ft. Torque jam nut to 22 lb-ft. See Illustration 29.
- 5) ☐ Using grease gun, grease tie rod end fittings until boot just starts to swell. DO NOT OVER GREASE.

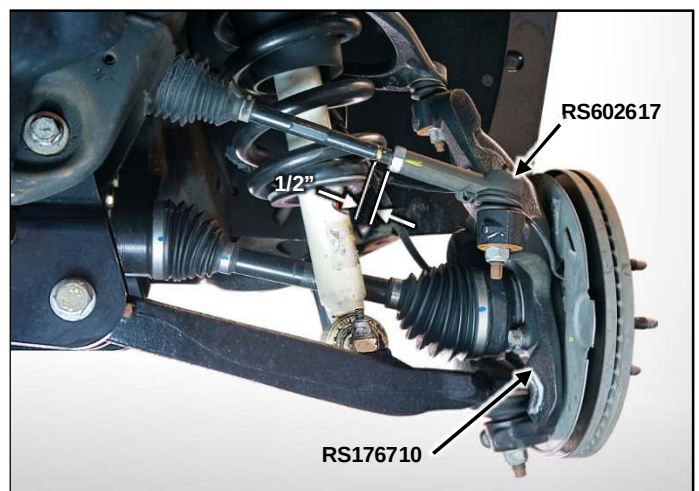


Illustration 29

BRAKE LINE DROP BRACKET AND CALIPER INSTALLATION

-  Box RS66308B-2 or RS66309B-2 (Box 2 of 5)
-  Brake Line Brackets RS176715 and RS176716
-  Hardware from Sub Assy RS860738

- 1) ☐ Install the brake rotor and attach with OE torx screw.
- 2) ☐ Apply thread lock and attach the caliper to the knuckle with the original mounting bolts. Torque the caliper mounting bolts to 129 lb-ft.
- 3) ☐ Install driver side brake line drop bracket RS176915 to upper control arm pocket using OE and supplied 1/4" hardware from kit RS860738. See Illustration 30.

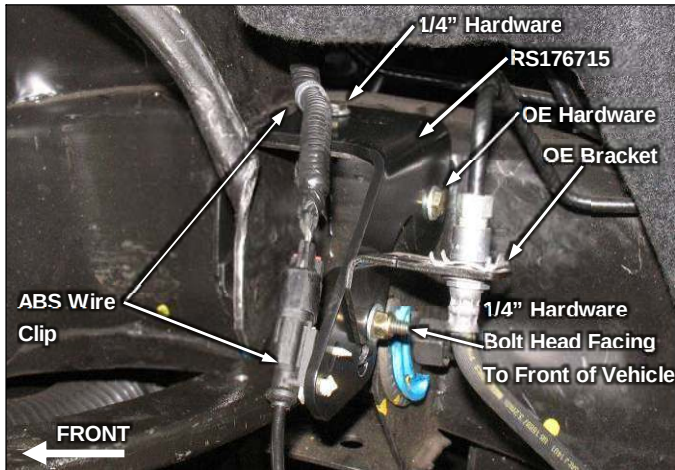


Illustration 30

- 4) ☐ Attach OE brake hose bracket to brake line drop bracket with supplied 1/4" hardware from kit RS860738. Bolt head must face to the front of the vehicle to allow clearance for upper control arm. Reconnect ABS wire and insert ABS wire clip in brake line drop bracket and frame. See Illustration 30.
- 5) ☐ Repeat steps 1 through 4 on passenger side with brake line drop bracket RS176916.

SWAY BAR DROP BRACKET INSTALLATION

-  Box RS66308B-2 or RS66309B-2 (Box 2 of 5)
-  Sway Bar Drop Brackets RS176579
-  Hardware from Sub Assy RS860547

- 1) ☐ Using the washers and shorter M10x30mm bolts from hardware kit RS860547, loosely attach the sway bar drop brackets RS176579 to the frame rails at the original sway bar location. See Illustration 31.



Illustration 31

- 2) ☐ Using the washers and nuts from hardware kit RS860547, and OE bolts, loosely attach the sway bar to drop brackets RS176579.

- 3) ☐ Loosely attach the sway bar end links to the lower control arms with the original end link assemblies.

NOTE: If unable to attach sway bar to lower control arm, wait until the vehicle is on the ground at ride height.

- 4) ☐ Torque all sway bar drop bracket mounting bolts to 45 lb-ft. Do not tighten sway bar end links to lower control arm.

LOWER VEHICLE

- 1) ☐ Install front wheels and lower vehicle to ground. Torque the lug nuts to 140 lb-ft.
- 2) ☐ Torque the lower control arm pivot bolts to 107 lb-ft. Torque the sway bar end link bolts to 22 lb-ft.

LEAF SPACER AND RISER BLOCK INSTALLATION

 Box RS66308B-4 or RS66309B-4 (Box 4 of 5)

 Riser Blocks RS15114

 U-Bolts RS740014

 Hardware from Sub Assy RS8102

 Hardware from Sub Assy RS8051

 Hardware from Sub Assy RS60410

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

2) ☐ Separate four ABS wire clips from frame and axle. Remove clips from wires.

3) ☐ Separate ABS sensors from axle by removing torx bolts and sliding sensor out of axle. The passenger side brake hose bracket may need to be separated from the parking brake bracket to remove passenger side ABS sensor.

4) ☐ Separate top and bottom halves of brake hose bracket at top of differential. See Illustration 32.

5) ☐ Remove both fore and aft parking brake hanger brackets from frame. See Illustration 33.

6) ☐ Support the rear axle assembly with a floor jack. Remove both rear shock absorbers. Do not reuse OEM shock absorbers.

7) ☐ With the axle still being supported, remove the anchor plate and U-bolts from driver side. See Illustration 34.

8) ☐ Loosen passenger side U-bolt nuts two turns each.

 **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.

9) ☐ Carefully lower the rear axle and remove the original riser block. Do not allow the axle to hang by any hoses or cables.

10) ☐ Insert a block pin from kit RS8051 into the hole in the axle pad.

11) ☐ Place the new riser block RS15114 on the axle pad with the taller end of the block in the rear and the writing facing up. See Illustration 35.

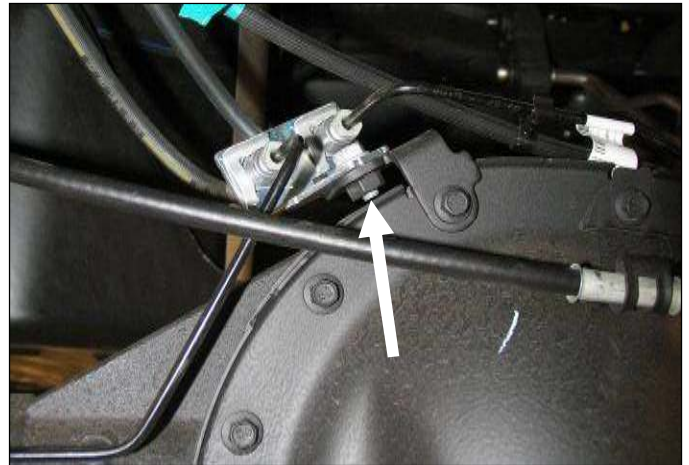


Illustration 32

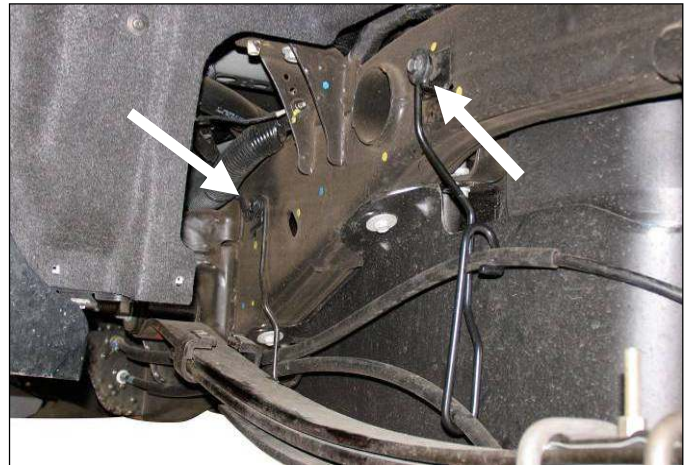


Illustration 33

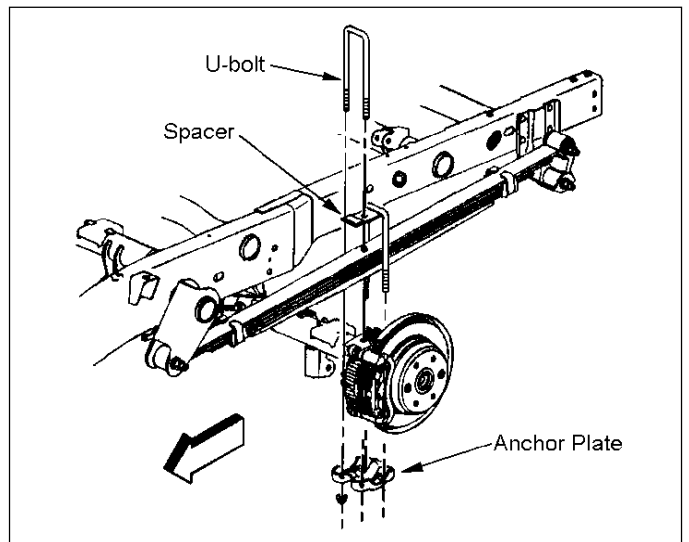


Illustration 34

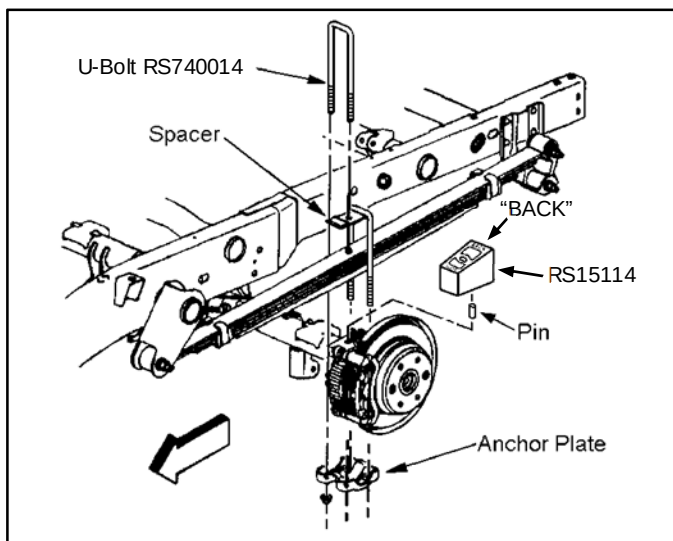


Illustration 35

- 12) ☐ Raise the axle assembly until the riser block contacts the leaf. Be sure to align the hole in the block with the head of the center bolt.

NOTE: If necessary, CAREFULLY loosen the passenger side U-bolt nuts another 1-2 turns. Do not allow axle to twist or sway.

- 13) ☐ Reinstall the U-bolt spacer on top of the leaf spring. Attach the spring to the axle with the NEW U-bolts RS740014, original anchor plate and spacer, and hardware from kit RS8102. Snug the nuts down but do not tighten.

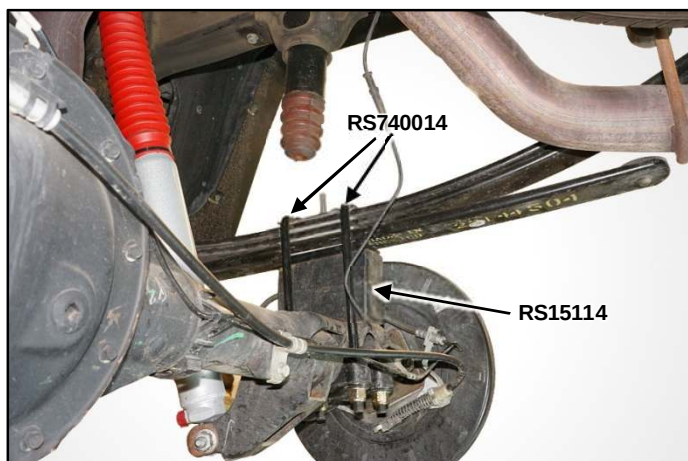


Illustration 36

- 14) ☐ Repeat steps 7 through 16 for the other side.
- 15) ☐ Cross tighten the U-bolt nuts evenly to 89 lb-ft. Recheck the torque on the center bolt.
- 16) ☐ Install new Rancho shock absorbers or relocater kit RS6202. Torque hardware to 85 lb-ft.

BUMP STOP SPACER INSTALLATION

- Box RS66308B-4 or RS66309B-4 (Box 4 of 5)
- Bump Stop Spacers RS176477
- Hardware from Sub Assy RS860582

- 1) ☐ Remove the bolt holding the bump stop to the frame bracket. Remove the bump stop.
- 2) ☐ Place bump stop spacer RS176477 against frame bracket. Attach original bump stop to spacer with the 10mm hardware from kit RS860582. See Illustration 37.



Illustration 37

- 3) ☐ Repeat steps 1 and 2 for the other side.

BRAKE LINE BRACKET INSTALLATION

- Box RS66308B-4 or RS66309B-4 (Box 4 of 5)
- Hardware from Sub Assy RS860750
- Brake Line Bracket RS176722

- 1) ☐ Remove the lower half of the brake hose bracket from top of differential housing. Attach the new brake line bracket RS176722 in sub assy. RS860750 to the rear differential with the OE hardware. See Illustration 38.
- 2) ☐ Carefully reshape the OE hard brake lines and twist the plastic brake line retainers on the axle to allow OE brake line bracket to attach to RS176722. Attach the upper brake hose bracket to the top of bracket RS176722 using the 5/16" hardware from kit RS860750.
- 3) ☐ Remove the driver side (lower) parking brake cable from the aft OE parking brake hanger wire.
- 4) ☐ Reinstall both fore and aft OE parking brake hanger wires. See Illustration 39.
- 5) ☐ Install rear wheels and lower vehicle to ground. Torque lug nuts to 140 lb-ft.

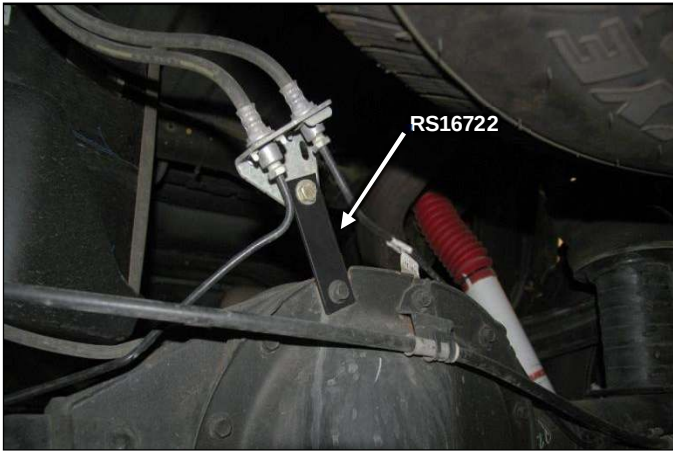


Illustration 38

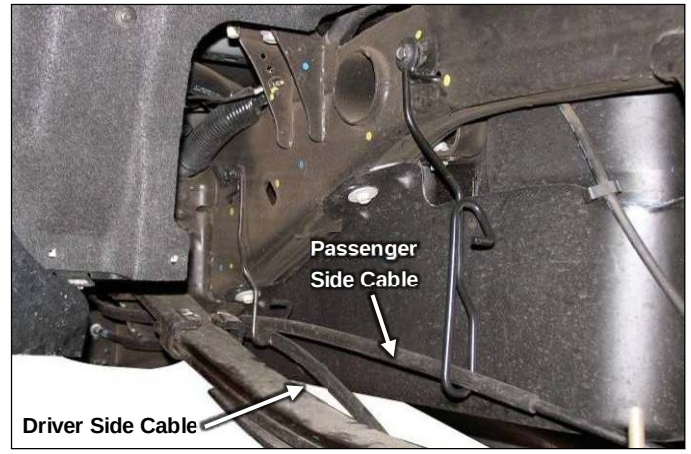


Illustration 39

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 driveshafts. 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): $4.5^{\circ} \pm 1.0^{\circ}$
 Camber (degrees): 0° - neg $.3^{\circ}$
 Sum Toe In (degrees): $.1^{\circ} \pm .2^{\circ}$

- 5) ☐ 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. Record these measurements in the space provided below.

LR _____	LF _____
RR _____	RF _____

Please retain this publication for future reference.

Torque Specs

Front Components

Subframe to frame	107 lb-ft
Differential Drop Brackets	65 lb-ft
Differential Torque Bracket to Subframe	90 lb-ft
Differential Case Bolts (Torque Bracket)	35 lb-ft
Skid Plate RS176832	35 lb-ft
Driveshaft Retainer	22 lb-ft
Upper Shock Mount	33 lb-ft
Lower Shock Mount	44 lb-ft
Hub	133 lb-ft
Lower Ball Joint Stud	74 lb-ft
Upper Ball Joint Stud	37 lb-ft
Tie Rod End Ball Stud	33 lb-ft
Tie Rod End Jam Nut	22 lb-ft
Axle – Inside Flange	58 lb-ft.

Front Components - continued

Axle – Outer Nut	165 lb-ft.
Brake Caliper	129 lb-ft.
Sway Bar Mounting Bracket	45 lb-ft.
Sway Bar End Link	22 lb-ft.
Lower Control Arm	107 lb-ft.
Wheels (Lug Nuts)	140 lb-ft.

Rear Components

U-Bolts	89 lb-ft
Shock Absorber	85 lb-ft
Bump Stop	32 lb-ft
Wheels (Lug Nuts)	140 lb-ft

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

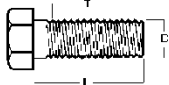
1/2-13x1.75 HHCS

D T L X



Grade 5

L = Length (inches)
X = Description (hex head cap screw)



Grade 8

G = Grade Marking (bolt strength)
D = Nominal Diameter (inches)
T = Thread Pitch (threads per inch)

M12-1.25x50 HHCS

D T L X



L = Length (millimeters)

P = Property Class (bolt strength)
D = Nominal Diameter (millimeters)
T = Thread Pitch (thread width, mm)



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