

INSTALLATION INSTRUCTIONS



For Rancho Suspension Systems:

RS66500B — 4½" Lift

2016-2015 Ford F150 4WD

— FMVSS 126 Certified —

Requires Rancho shock absorber or strut spacers for installation.

Replacement front driveshaft may be required.

(Must be purchased separately)

See page 4



Fits OE 18" and up rims and spare
ONLY WITH OE TIRES

Tested With:
BFGoodrich All-Terrain T/A KO2 35X12.50R18LT Tires
Vision Manx 18 x 9 +18 Offset (5.6" Backspacing) Wheel

Shown With:
Nitto Terra Grappler G2 LT295/60R20 Tires
American Force 20 x 9 x 5.0 Backspacing

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: 35X12.50R18LT tires 18X9 +18 offset (5.6" Back-spacing) 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.

Rancho Suspension

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

OE front shock absorbers can be re-used with Rancho Strut Tower Kit RS88519

⚠ 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
RS9000XL		RS999287
RS7000MT	RS7838	RS7287
RS5000X	RS55838	RS55287
RS5000		RS5287
Strut Tower	RS886519*	

*FOR USE WITH OE FRONT SHOCK ONLY

Front Driveshaft

Due to the change in the front drive shaft angle, Rancho suggests replacing the front drive shaft with a double cardan design if the truck is going to be driven in 4 Wheel Drive mode often, or if driven in 4A (4-Wheel Drive Auto).

A replacement front double cardan driveshaft is available from Powertrain Industries.

Order Part Number 3194-3225 from Powertrain Industries, Garden Grove, CA, 1-800-798-4585.

Wheels and Tires

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

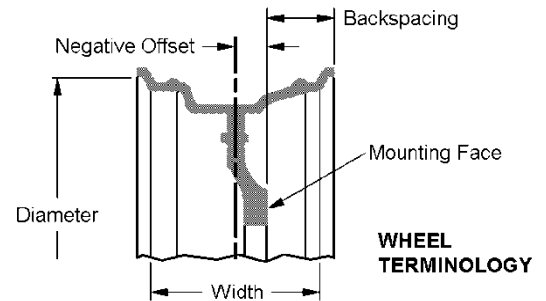
Tire: BFGoodrich All-Terrain T/A KO2 35X12.50R18LT

Wheel: Vision Manx 18 x 9 +18 Offset (5.6" 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 ¹	35X12.50R18LT (34.8"x12.5")	18x9 (5.6")

¹ OE wheels compatible with stock size tires only.



Available Accessories

RS60501: Rancho Rear Add-A-Leaf – Provides an additional 1.5" – 2" of lift in rear.

If additional rear lift is desired, Rancho Add-A-Leaf RS60501 may be purchased separately.

Perfect for towing, the additional weight of a camper, or any time more lift is desired in the rear.

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

Ford Service Manual
Die Grinder with cut-off blade or Sawzall
Vacuum Cap
Coil Spring Compressor
Torque Wrench (260 FT-LB capacity)
Ford Ball Joint Tool- part number- 204-592
1/2" Drive Ratchet and Sockets
Assorted Combination Wrenches

Heavy Duty Jack Stands
Wheel Chocks (wooden blocks)
Hydraulic Floor Jack
File
Hammer
Wire Brush (to clean bracket mounting surfaces)
Black Enamel Paint

Silicone Spray Lubricant
Tape Measure
Safety Glasses--
Wear safety glasses at all times

Parts List

Box 1 of 4



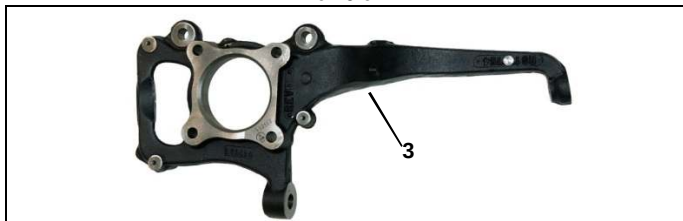
ITEM	PART #	DESCRIPTION	QTY
	RS66500B-1	Box 1 Of 4	1
1	RS176742B	Subframe	1

Box 2 of 4



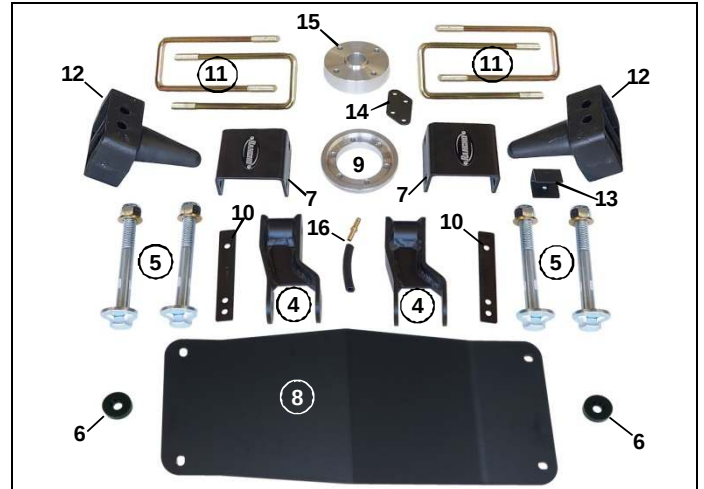
ITEM	PART #	DESCRIPTION	QTY
	RS66500B-2	Box 2 Of 4	1
2	RS176753	Knuckle - Left 4.5"	1

Box 3 of 4



ITEM	PART #	DESCRIPTION	QTY
	RS66500B-3	Box 3 Of 4	1
3	RS176754	Knuckle - Right 4.5"	1

Box 4 of 4



ITEM	PART #	DESCRIPTION	QTY
	RS66500B-4	Box 4 Of 4	1
4	RS176745B	Diff Drop Bracket	2
	RS860783	Sub Assy, Diff Drop	1
	RS770041	HHCS, M14-2.00X90MM	3
	RS7877	Nut, M14-2.00 Toplock	3
	RS770109	Washer, M14	6
	RS860784	Sub Assy, Alignment Bolt	1
5	RS176311	Cam Bolt	4
	RS770123	Washer, M18	4
	RS770118	Nut, M18 X 2.5 Nylock	4
	RS860788	Sub Assy, Lower Ball Joint	1
6	RS176755	Lower Ball Joint Spacer	2
7	RS176746B	Sway Bar Drop Brkt	2
	RS860506	Sub Assy, Front M10	2
	RS770080	HHCS, M10-1.50X30MM	4
	RS7657	Nut, M10-1.50 Nylock	4
	RS770064	Washer, M10	8
8	RS176747B	Skid Plate	1
9	RS176809	Front Driveshaft Spacer	1
	RS860814	Sub Assy, Front Driveshaft Spacer	1
	RS770283	12 Pt. M10-1.50X90MM Class 12	6
	RS770230	Washer, M10, 18mm OD	6
	RS42702	Thread Lock	1
10	RS176587	Front Brake line Bracket	2
	RS860786	Sub Assy, Brake line Bracket	1
	RS770127	HHCS, M8-1.25X20Mm	2
	RS603112	Nut, M8-1.25 Nylock	2
	RS770128	Washer, M8	4
	RS1900-12	Wire Tie 10 pack	1
11	RS740017	U-Bolt, 9/16-18X3.16X12	4
	RS860152	Sub Assy, 9/16 U-Bolt	1
	RS770062	Washer, 9/16 X 3/16 Thick	8
	RS7737	Nut, 9/16-18 Nylock	8
12	RS15104	Winged Riser Block	2
	RS860787	Sub Assy, Rear Brake	1
13	RS176748	Parking Brake Cable Drop	1
14	RS176314	Rear Brake Hose Drop	1
	RS770128	Washer, M8	5
	RS603112	Nut, M8-1.25 Nylock	3
	RS770127	HHCS, M8-1.25X20Mm	2
	RS860731	Sub Assy, Rear Drive Shaft	1
15	RS176691	Rear Drive Shaft Spacer	1
	RS860732	Sub Assy, Spacer Hardware	1
	RS77035	HHCS, M12-1.75X70MM	4
	RS7915	Washer, M12	4
16	RS860749	Sub Assy, Vent Hose	1
	RS96327	Tube Fitting	1
	RS96328	Rubber Tube	1
	RS89500	Instructions RS66500B	1
	RS94180	Information Pack	1

- 2) ☐ Raise the front of the vehicle and support the frame with jack stands. Remove the front wheels and set them aside.
- 3) ☐ If applicable, remove the front splash shields and / or skid plates. Remove splash shield brackets from side of frame rails. See Illustration 3 and Illustration 4.

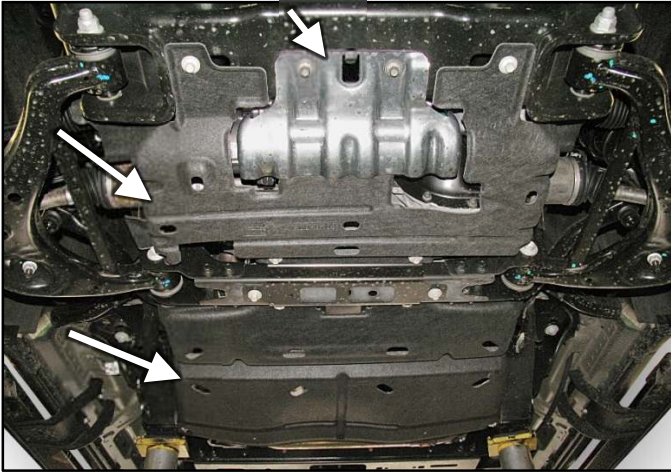


Illustration 3



Illustration 4

- 4) ☐ Hold the hex stud and remove the nut attaching the sway bar end link to the sway bar. See Illustration 2 and Illustration 5. Repeat for other side.

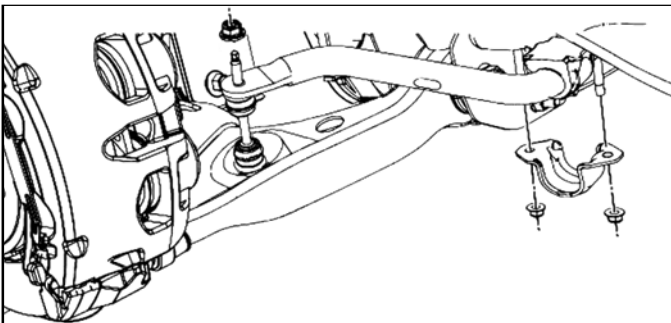


Illustration 5

- 5) ☐ Remove the four nuts holding the sway bar to the frame. Remove the sway bar assembly. See Illustration 5.

STEERING KNUCKLE, SHOCK & LOWER CONTROL ARM REMOVAL

- 1) ☐ Separate the ABS wire from brake hose. Separate plastic clips holding vacuum line and ABS wire from brackets and frame. Remove brackets from frame and steering knuckle. Separate metal brake line from plastic clip in frame. Separate vacuum line from steering knuckle. See Illustration 6.

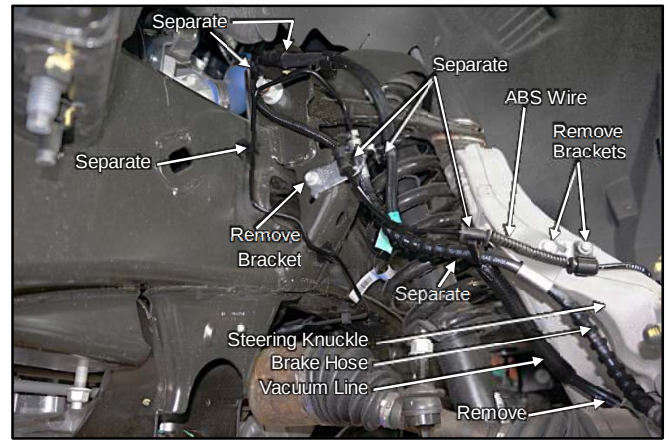


Illustration 6

- 2) ☐ Remove the brake caliper anchor bolts. See Illustration 7. 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.

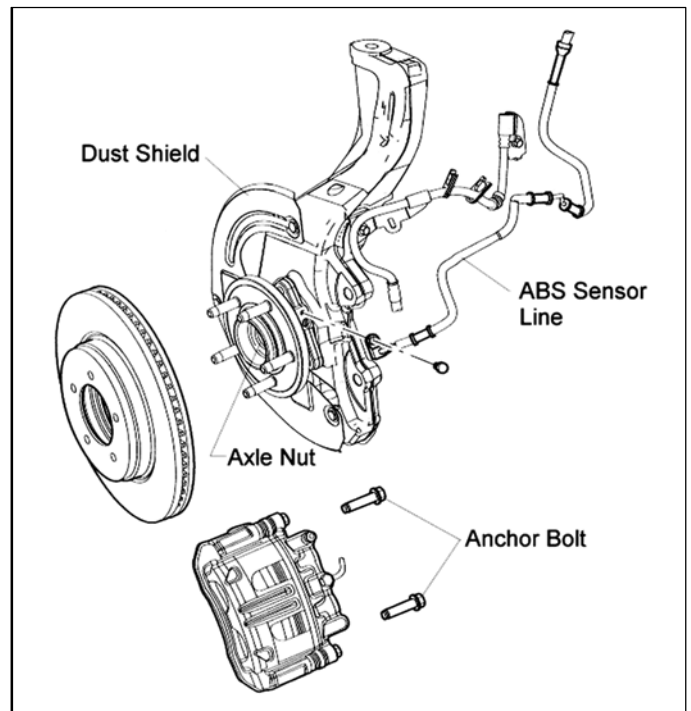


Illustration 7

- 3) ☐ Label the brake rotor left or right. Remove the brake rotor.
- 4) ☐ Remove the dust shield. Disconnect the ABS sensor from the wheel hub. See Illustration 7.
- 5) ☐ Remove the axle cap using a small chisel and hammer to pry off. Remove axle nut. See Illustration 7.

⚠ 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) ☐ Mark position of alignment cams (if equipped) and loosen all four lower control arm pivot bolts.
- 7) ☐ Loosen the nut at the outer tie rod stud. Using Ford Service tool #204-592 separate tie rod end stud from knuckle. See Illustration 1.
- 8) ☐ Loosen the nuts at the upper and lower ball joints. Using Ford Service tool #204-592 separate ball joints from knuckle.
- 9) ☐ Remove the tie rod end nut and remove tie rod end stud from knuckle.
- 10) ☐ Remove the upper and lower ball joint nuts. Carefully remove the steering knuckle. Cover the exposed hub to prevent contamination.
- 11) ☐ Loosen the three shock absorber upper mount to frame nuts. See Illustration 8
- 12) ☐ Remove the shock absorber lower mounting nuts and swing lower control arm down off the shock studs.
- 13) ☐ Remove the three shock absorber upper mount to frame nuts. Remove the shock absorber and spring assembly.
- 14) ☐ Remove the lower control arm pivot bolts. Remove the lower control arm. See Illustration 8.

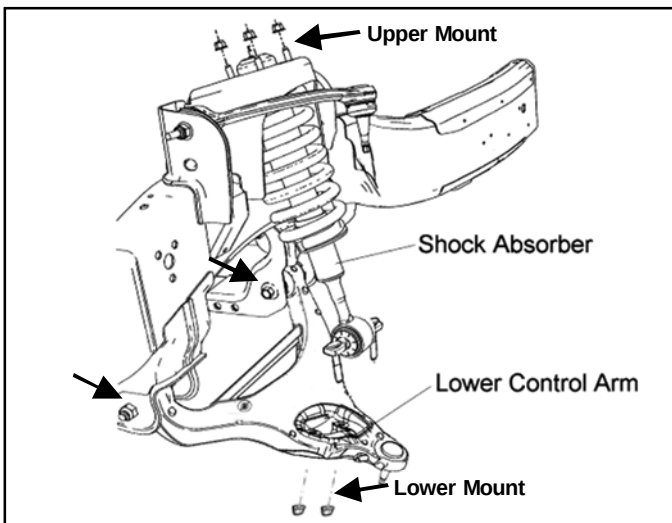


Illustration 8

FRONT DIFFERENTIAL REMOVAL

- 1) ☐ Remove the four bolts that attach the cross-member to the lower control arm pockets. Remove the cross-member. See Illustration 9.

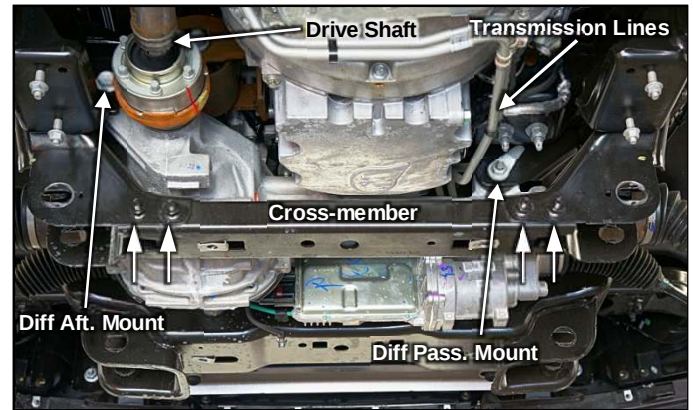


Illustration 9

- 2) ☐ Index-mark the front driveshaft flange to the front differential pinion flange.
- 3) ☐ Remove the six bolts from the driveshaft flange. Disconnect and support the front driveshaft.
- 4) ☐ Disconnect the vent hose from the axle housing. See Illustration 10

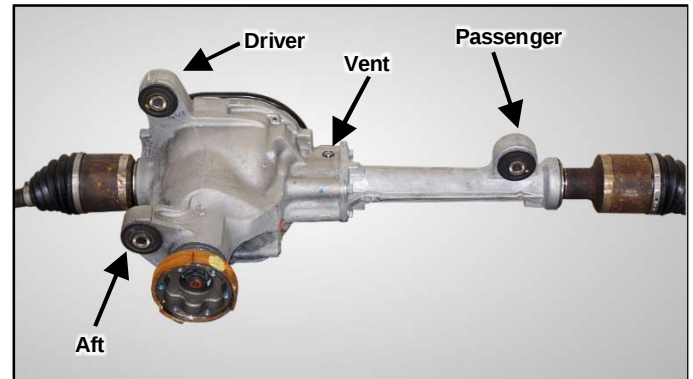


Illustration 10

- 5) ☐ Support the front differential assembly with a floor jack.
- 6) ☐ Remove the front differential assembly aft mounting bolt. See Illustration 10.
- 7) ☐ Remove the differential assembly passenger side mounting bolt.

CAUTION: Take care that flag-nut does not damage metal transmission lines.

- 8) ☐ Pushing up on the right side of the right axle housing, remove the driver side mounting bolt.
- 9) ☐ Remove the differential assembly from the vehicle.

Note: A plastic shield covering the steering rack may need to be removed to access bolt. This shield is fastened to the frame with two plastic clips. See Illustration 11. Shield shown removed. Shield fits in same position, but inside of frame rail.



Illustration 11

FRONT DIFFERENTIAL & SUBFRAME INSTALLATION

 Box RS66500B-1 (Box 1 of 4)

 Subframe RS176742B

 Box RS66500B-4 (Box 4 of 4)

 Diff Drop Brackets RS176745B

 Skid Plate RS176747B

 Hardware from Sub Assy RS860783

 Hardware from Sub Assy RS860784

 Hardware from Sub Assy RS860506

1) ☐ If applicable, cut the driver side corner off the steering rack skid plate and debur cut edge. Reinstall using OE hardware. See Illustration 12.

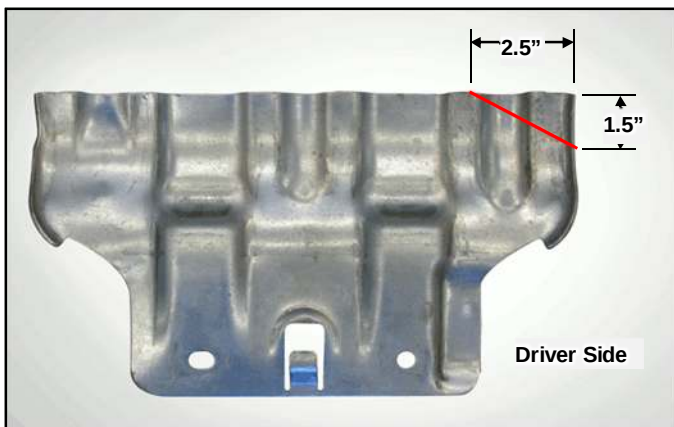


Illustration 12

2) ☐ Install skid plate RS176747B to the bottom of subframe RS176742B using 10MM hardware from RS860506. Torque to 45 ft. lbs. See Illustration 13.



Illustration 13

3) ☐ Draw a line, perpendicular to the bottom edge and $\frac{1}{2}$ " from the edge of the slotted hole, on the front and back of the driver side crossmember bracket. Connect the lines on the top of the bracket providing a minimum of 5" clearance. See Illustration 14.

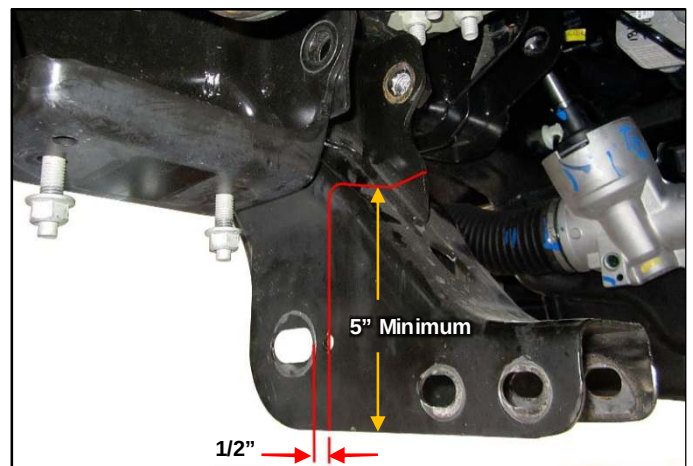


Illustration 14

4) ☐ Using a die grinder and Sawzall follow the line and cut off the crossmember bracket rounding off any sharp corners. Paint bare metal to prevent rust. See Illustration 15.

⚠ 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.

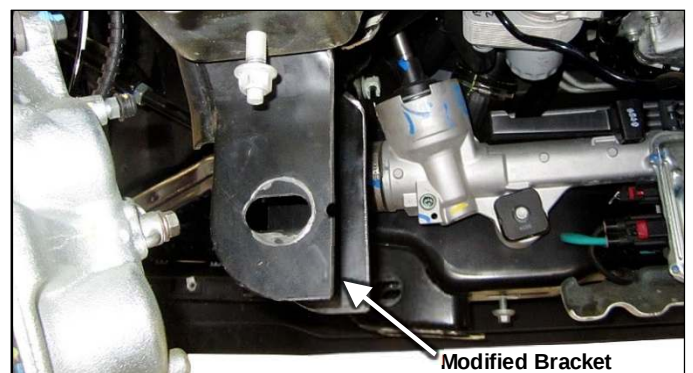


Illustration 15

5) ☐ Loosely attach diff drop brackets RS176745B to the front differential upper and passenger side frame brackets with the original hardware. See Illustration 16 and Illustration 17.

6) ☐ With the help of an assistant, carefully raise the front differential assembly up into the left and right drop brackets. Loosely attach the differential assembly to the brackets with the hardware from kit RS860783.

7) ☐ With the help of an assistant, raise subframe RS176742B into the lower control arm frame brackets and aft diff mount. Attach sub frame to the lower control arm brackets with original hardware.

8) ☐ Attach aft differential mount to subframe RS176742B with 14mm hardware from kit RS860783. See Illustration 18.

9) ☐ **CAUTION:** With sub frame in place, verify that the differential lower mount does not contact the modified frame bracket. There must be a minimum of 1/4" clearance between frame and differential. Contact may cause vibration. See Illustration 18.

10) ☐ Tighten the following bolts in order: Subframe RS176742B to frame bolts to 258 ft. lbs.; the differential aft mounting bolt to 85 ft. lbs., and the differential drop bracket bolts to 85 ft. lbs.

11) ☐ Apply grease or anti-seize (not included) to the threads of cam bolts RS176311 (4) from kit RS860784.

12) ☐ Loosely attach the lower control arm to the subframe with the lubricated cam bolts and hardware from kit RS860784. Insert front alignment cam bolt, insert from front to rear. Rear cam bolt, insert from rear to front. Align cams straight up.

CAUTION: Do not get grease or anti-seize on cam or sub-frame where cam seats.

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

FRONT DRIVESHAFT SPACER INSTALLATION

 Box RS66500B-4 (Box 4 of 4)

 Driveshaft Spacer RS176809

 Hardware from Sub Assy RS860814

1) ☐ Align index marks on front driveshaft, insert spacer RS176809 between driveshaft and pinion flange. Secure together with 12pt 10mm hardware from kit RS860814 using OE torque plates. Tighten bolts to 41 ft. lbs. See Illustration 19. **Use of blue thread lock is recommended but not included.**



Illustration 16

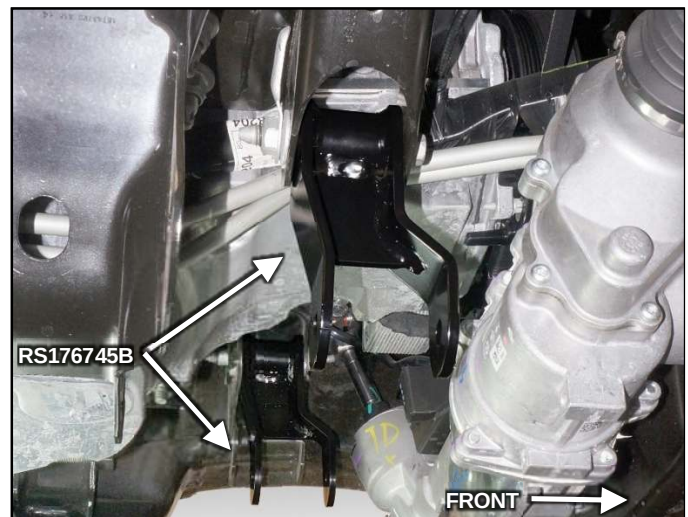


Illustration 17



Illustration 18

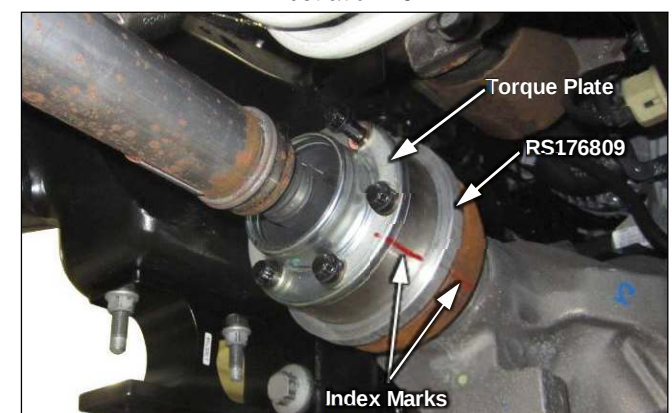


Illustration 19

SHOCK ASSEMBLY

FOR OPTIONAL RANCHO REPLACEMENT SHOCK ABSORBERS RS7838 or RS55838.

If reusing OE shock absorber, proceed to next section - "Strut Tower Installation"

CAUTION: Follow instructions and warnings supplied with shock absorber.

⚠ WARNING: SPRING IS UNDER COMPRESSION LOAD WHEN INSTALLED. ATTEMPTS TO REMOVE SPRING WITHOUT PROPERLY RESTRAINING THIS LOAD MAY RESULT IN INJURY. NEVER REMOVE THE CENTRAL LOCK NUT OF THE UPPER MOUNTING PARTS BEFORE THE SPRING IS COMPRESSED.

IF A SUITABLE SPRING COMPRESSOR TOOL IS NOT AVAILABLE, OR A QUALIFIED OPERATOR IS NOT AVAILABLE, MOST REPAIR SHOPS CAN SWAP THE COIL FOR A SMALL CHARGE.

- 1) ☐ Using a quality spring compressor, compress the coil spring until the tension is released from the shock absorber. See Illustration 20

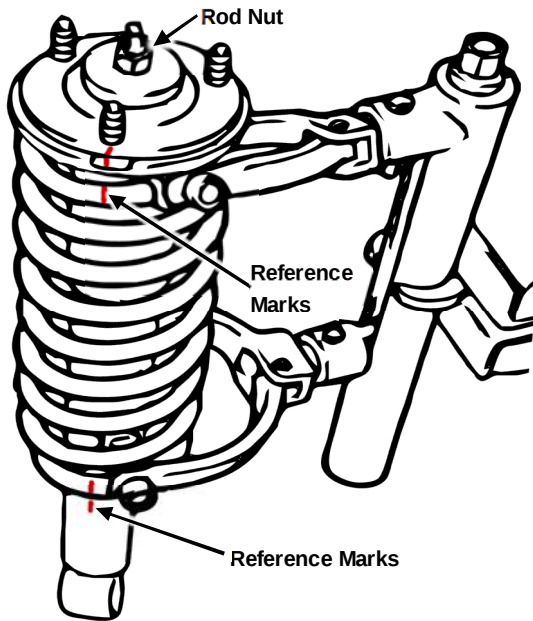


Illustration 20

- 2) ☐ Remove the upper shock rod mounting nut. Slide the shock absorber out of the spring assembly.
- 3) ☐ Insert new shock absorber into spring assembly. Use index marks to align shock with the coil and upper mount. Install the original mounting nut. Tighten the nut to 22 ft. lbs.
- 4) ☐ Remove spring compressor.
- 5) ☐ Insert the shock absorber assembly into the upper frame mount. Loosely install with OE nuts.
- 6) ☐ Attach the shock absorber to the lower control arm with the original hardware. Tighten lower mounting bolts to 66 ft. lbs. Tighten nuts at upper mount to 30 ft. lbs. See Illustration 22.

STRUT TOWER INSTALLATION

 Box RS886519

 Shock Spacers RS176708B

 Hardware from Sub Assy RS860746

FOR OE FORD SHOCK ONLY.

If replacing shock absorbers with Rancho shock absorber RS7838 or RS55838, skip to next section - "Shock Absorber Installation"

- 1) ☐ Using OE nuts, install strut tower RS176708B onto OE shock absorber. Tighten to 30 ft. lbs. See Illustration 21.

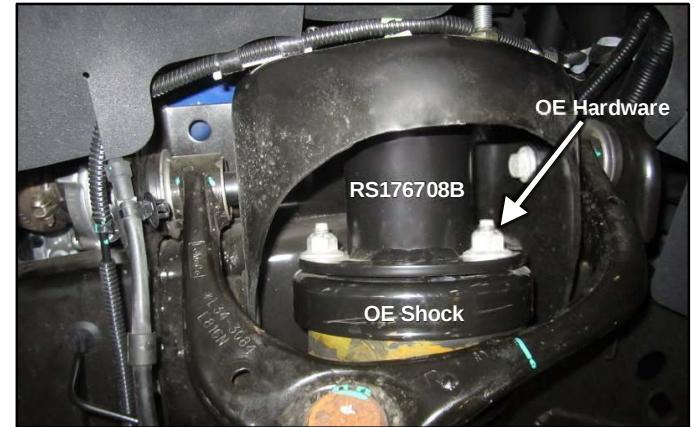


Illustration 21

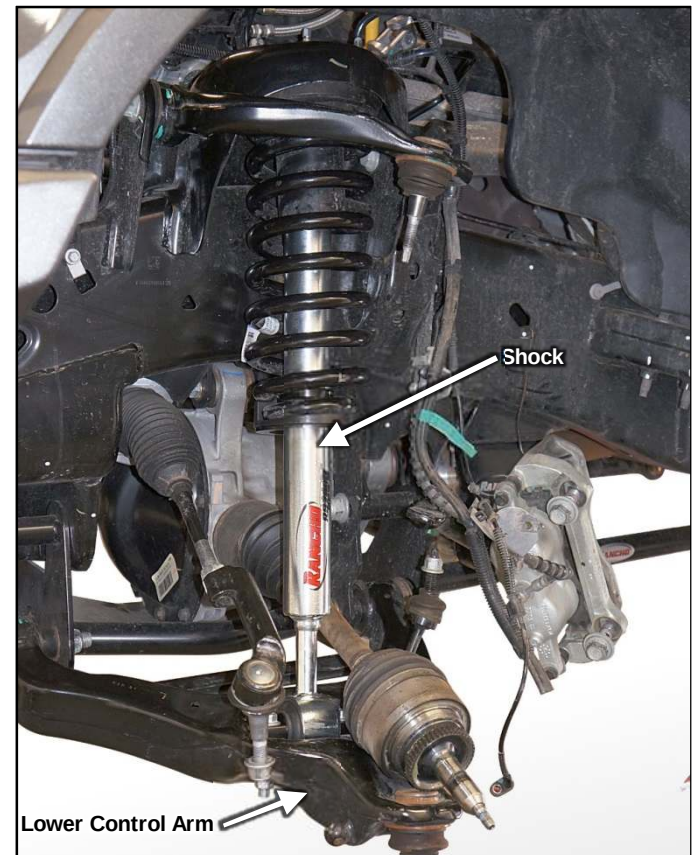


Illustration 22

3) ☐ Insert the shock absorber and strut tower assembly into the upper frame mount. Loosely install with nuts and washers from hardware kit RS860746. See Illustration 21 and Illustration 22.

4) ☐ Attach the shock absorber to the lower control arm with the original hardware. Tighten lower mounting bolts to 66 ft. lbs. Tighten nuts at upper mount to 30 ft. lbs. See Illustration 22.

STEERING KNUCKLE INSTALLATION

 Box RS66500B-2 (Box 2 of 4)

 Left Steering Knuckle RS176753

 Box RS66500B-3 (Box 3 of 4)

 Right Steering Knuckle RS176754

 Box RS66500B-4 (Box 4 of 4)

 Sub Assy RS860788

 Lower Ball Joint Spacer RS176755

1) ☐ Remove the integrated wheel end and wheel hub from the passenger side steering knuckle. See Illustration 23.

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

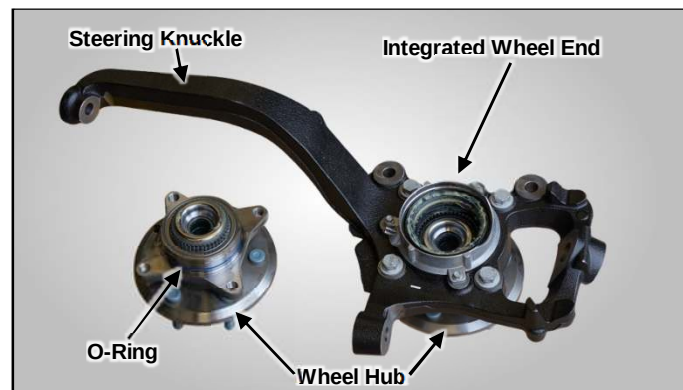


Illustration 23

2) ☐ Align the ABS sensor hole to the top of the knuckle and attach the wheel hub to right Rancho knuckle RS176754 with the original bolts. Tighten the bolts to 129 ft. lbs.

3) ☐ Align vacuum port upward and attach the integrated wheel end to the knuckle with the original hardware. Tighten the bolts to 11 ft. lbs.

4) ☐ Install knuckle on vehicle:

☐ Carefully insert the axle into the hub until the threads protrude from hub bearing. See Illustration 24

☐ Insert lower ball joint stud into steering knuckle and loosely attach with OE nut.

☐ Insert upper ball joint stud into steering knuckle and loosely attach with OE nut.

☐ Pull, wiggle and turn axle to seat fully in hub bearing. See Illustration 24

Note: The axle splines must line up with the integrated wheel end. Do not force axle in. You may need to separate upper ball joint and turn axle or integrated wheel end, then repeat step 4.

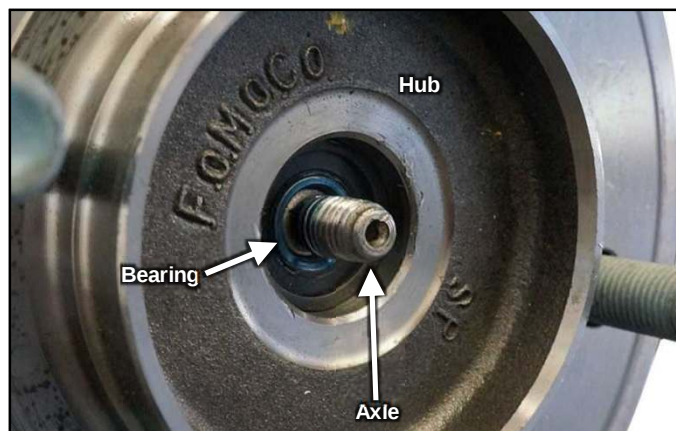


Illustration 24

5) ☐ Support knuckle and remove lower ball joint nut. Place lower ball joint spacer RS176755 from kit RS860788 on lower ball joint stud with counter bore (recess) against knuckle. Reinstall lower ball joint nut. Tighten the lower ball joint stud nut to 111 ft. lbs. and the upper nut to 85 ft. lbs. See Illustration 25.

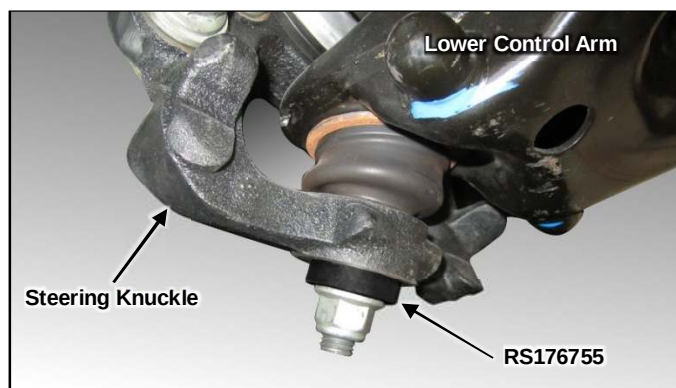


Illustration 25

6) ☐ Install the axle half shaft nut. Tighten the nut to 20 ft. lbs. Install the axle cap.

7) ☐ Loosen the jam nut on the tie rod and thread the tie rod end out approximately 7 3/4 turns. Insert the tie rod end from the top into the steering knuckle and install the original nut. Tighten the ball stud nut to 85 ft. lbs. and the jam nut to 76 ft. lbs.

8) ☐ Repeat steps 1 through 7 for the driver side using left Rancho knuckle RS176743.

CALIPER AND BRAKE HOSE DROP BRACKETS

 Box RS66500B-4 (Box 4 of 4)

 Front Brake line Brackets RS176587

 Hardware from Sub Assy RS860786

1) ☐ Re attach the ABS sensor to the wheel hub and the vacuum hose to the integrated wheel end.

- 2) ☐ Attach the dust shield with the original hardware. Tighten the bolts to 12 ft. lbs.
- 3) ☐ Install the right brake rotor on the passenger side wheel hub.
- 4) ☐ Install the brake caliper over the rotor. Attach the caliper to the knuckle with the original anchor bolts. Tighten the bolts to 175 ft. lbs. Refer back to Illustration 1 and Illustration 2.
- 5) ☐ Using the original bolt and location, attach brake hose drop bracket RS176587 to the frame rail. Tighten bolt securely.

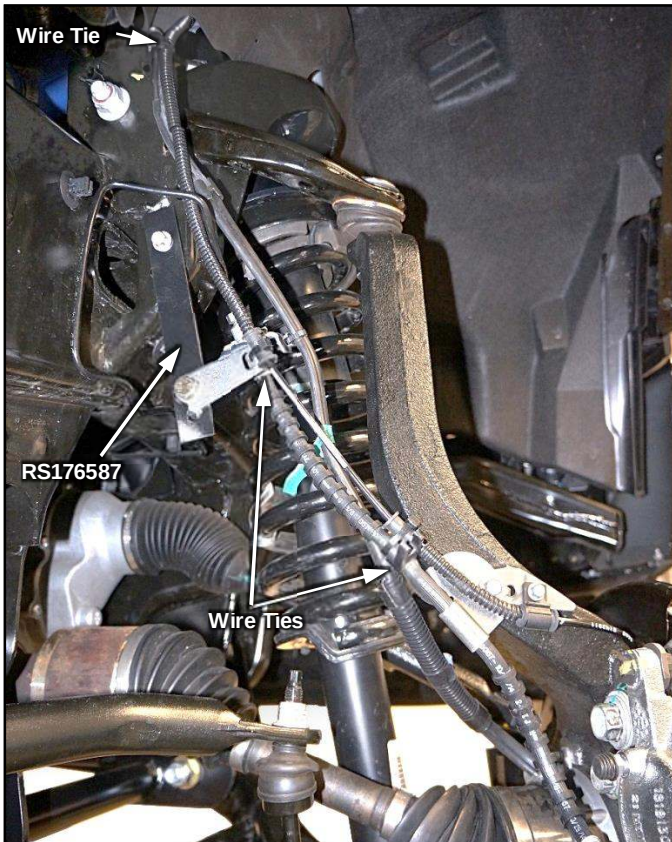


Illustration 26

- 6) ☐ Attach brake hose to drop bracket RS176587 with hardware from kit RS860786. See Illustration 26.
- 7) ☐ Reattach the vacuum line clips to brake line brackets. Reposition line on clips if needed.
- 8) ☐ Use wire ties to attach ABS wire to brake line and upper OE mount. Attach ABS wire and vacuum line to frame at upper control arm mount with wire ties. See Illustration 26
- 9) ☐ Repeat for other side.
- 10) ☐ Turn the front wheels completely left then right. Verify adequate, ABS, brake, and vacuum line clearance and length.

VENT HOSE EXTENSION INSTALLATION

Box RS66500B-4 (Box 4 of 4)

Hardware from Sub Assy RS860749

- 1) ☐ From kit RS860749, Insert tube fitting into rubber tube.
- 2) ☐ Insert other end of tube fitting in OE vent hose.

- 3) ☐ Install lengthened vent hose on differential in OE location. See Illustration 27

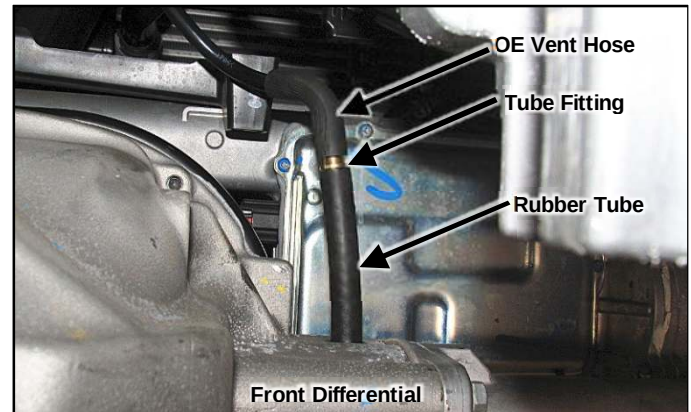


Illustration 27

SWAY BAR INSTALLATION

Box RS66500B-4 (Box 4 of 4)

Sway Bar Drop Brackets RS176746B

Hardware from Sub Assy RS860506

- 1) ☐ Attach sway bar drop brackets RS176746B to the frame with the original hardware. Tighten the nuts to 35 ft. lbs.
- 2) ☐ Attach the sway bar to the drop brackets with 10MM hardware from kit RS860506. Torque to 35 ft. lbs. See Illustration 28.

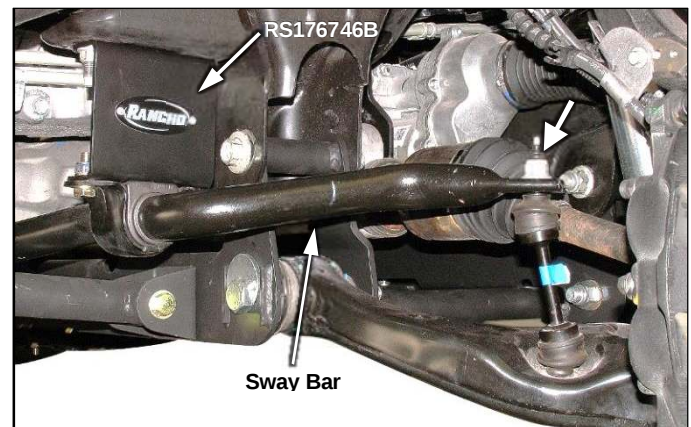


Illustration 28

- 3) ☐ Attach the sway bar end links to the sway bar. Tighten the nuts to 59 ft. lbs.
- 4) ☐ Install front wheels and turn the front wheels completely left then right. Verify adequate tire, wheel, and ABS, brake, and vacuum line clearance and length.
- 5) ☐ Lower vehicle to ground. Tighten the lug nuts to 150 ft. lbs.
- 6) ☐ Align the cam bolts in the center and tighten the lower control arm pivot nuts to 240 ft. lbs.

NOTE: If full torque cannot be achieved with vehicle at ride height, tighten cam bolts as much as possible on ground to lock bushing and alignment in place, then raise front of vehicle onto jack stands to apply final torque.

⚠ WARNING: Failure to fully torque lower control arm cam bolts can cause a sudden and unexpected change of vehicle alignment, resulting in loss of vehicle control and an accident.

REAR SUSPENSION

VEHICLE PREPARATION

- 1) ☐ Chock front wheels. Raise the rear of the vehicle and support the frame with jack stands. Remove the rear wheels.
- 2) ☐ On the driver side, separate the parking brake cable bracket from the bottom of the leaf spring mount. See Illustration 29.

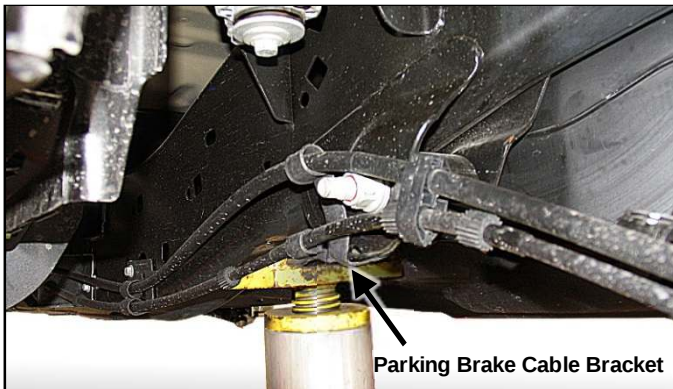


Illustration 29

- 3) ☐ Remove the brake hose bracket from the inside of the driver side frame rail. Disconnect plastic clips holding brake line and wire harness to inside of frame rail. See Illustration 31.

RISER BLOCK INSTALLATION

- Box RS66500B-4 (Box 4 of 4)
- Riser Blocks RS15104
- U-Bolts RS740017
- Hardware from Sub Assy RS860152

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

⚠ 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.

- 5) ☐ Place riser block RS15104 on the axle pad as shown in Illustration 21. Loosely attach the leaf spring to the axle with U-bolts RS740017 and the hardware from kit 860152. See Illustration 30

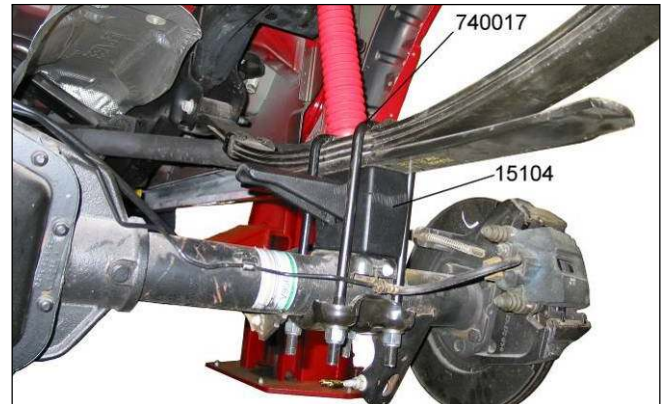


Illustration 30

- 6) ☐ Repeat steps 4 and 5 for the driver side.
- 7) ☐ Cross tighten all U-bolt nuts evenly to 85 ft. lbs.
- 8) ☐ Install new Rancho shock absorbers. Refer back to Important Note B.

BRAKE DROP BRACKETS INSTALLATION

- Box RS66500B-4 (Box 4 of 4)
- Rear Brake Hose Drop Bracket RS176314
- Parking Brake Cable Drop Bracket RS176748
- Hardware from Sub Assy RS860787

- 1) ☐ Attach rear brake hose drop bracket RS176314 to the frame with the original bolt. Tighten the bolt to 12 ft. lbs. See Illustration 31.

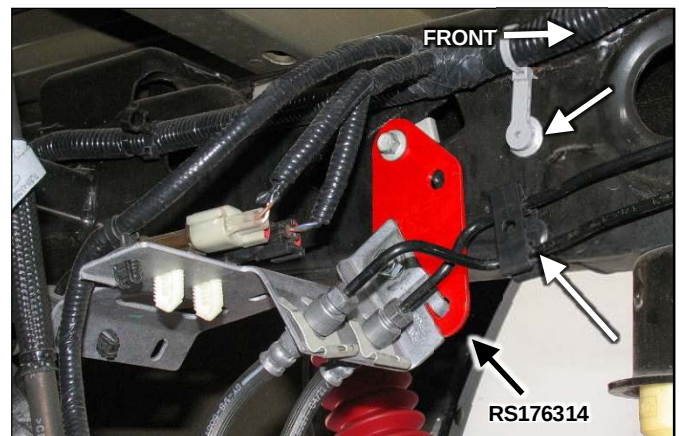


Illustration 31

- 2) ☐ Attach the original brake hose bracket to drop bracket RS176314 with the 8mm hardware from kit RS860787. Insert plastic clip on wire harness back into frame.
- 3) ☐ Attach parking-brake cable drop RS176748 to the leaf spring mount using OE bolt and hardware from kit RS860787.
- 4) ☐ Attach original parking brake cable bracket to RS176748 using 8mm hardware from kit RS860787. Tighten the bolt to 12 ft. lbs. See Illustration 32.



Illustration 32

- 5) ☐ Install rear wheels. Lower vehicle to ground. Tighten the lug nuts to 150 ft. lbs.

DRIVESHAFT SPACER INSTALLATION



Box RS66500B-4 (Box 4 of 4)



Sub Assy RS860731



Rear Driveshaft Spacer RS176691



Hardware from Sub Assy RS860732

- 1) ☐ Measure pull-out of rear output shaft slip joint. If pull-out exceeds 1¼" follow steps 2-5 to install rear driveshaft spacer RS176691. See Illustration 33.
- 2) ☐ Index-mark the rear driveshaft flange to the rear differential pinion flange.

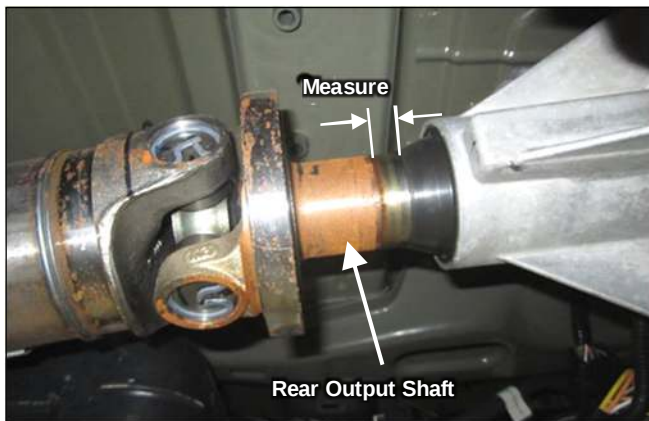


Illustration 33

- 3) ☐ Support rear driveshaft with floor jack.
- 4) ☐ Remove rear driveshaft flange to the rear differential pinion flange mounting bolts
- 5) ☐ Align index marks on rear driveshaft, insert rear driveshaft spacer RS176691 between driveshaft and pinion flange. Secure together with 12mm hardware from kit RS860732. Tighten bolts to 75 ft. lbs. See Illustration 34. **Use of blue thread lock is recommended but not included.**



Illustration 34

- 6) ☐ Install rear wheels.
- 7) ☐ Lower vehicle to ground. Tighten the lug nuts to 150 ft. lbs.

FINAL CHECKS & ADJUSTMENTS

- 1) ☐ Turn the front wheels completely left then right. Verify adequate tire, wheel, and brake hose clearance. Inspect steering and suspension for tightness and proper operation.
- 2) ☐ With the suspension at maximum extension (full droop), inspect and rotate all axles and drive shafts. Check for binding and proper slip yoke insertion. The slip yoke should be inserted a minimum of one inch into the transfer case and/or transmission.
- 3) ☐ Ensure that the vehicle steering and brake systems operate correctly.
- 4) ☐ Readjust headlamps.
- 5) ☐ Have vehicle Aligned at a certified alignment facility.

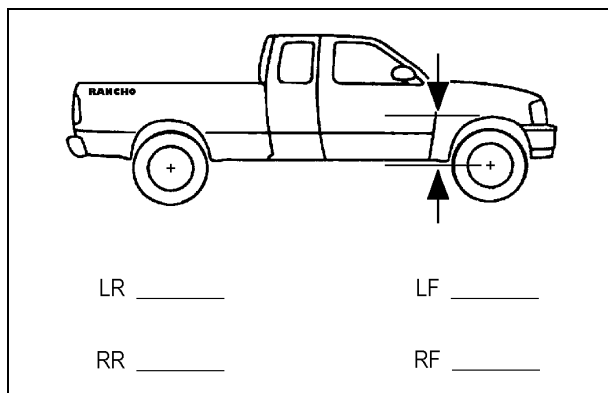
Recommended Alignment Specifications

Caster (degrees): $3.60^{\circ} \pm 1.00^{\circ}$

Camber (degrees): $-0.10^{\circ} \pm 0.75^{\circ}$

Sum Toe In (degrees): $0.2^{\circ} \pm 0.2^{\circ}$ or $0.10" \pm 0.10"$

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



Torque Specs

Front Components

Skid Plate RS176747B	45 ft. lbs.
Subframe RS176742B to Frame	258 ft. lbs.
Lower Control Arm to Subframe RS176742B	240 ft. lbs.
Differential Aft Mount to Subframe RS176742B	85 ft. lbs.
Differential Drop Bracket RS176745B	85 ft. lbs.
Driveshaft to Pinion Flange	41 ft. lbs.
Shock Mount, Upper	30 ft. lbs.
Shock Mount, Lower	66 ft. lbs.
Shock Spacer RS176708B	30 ft. lbs.
Wheel Hub to Steering Knuckle	129 ft. lbs.
Integrated Wheel End to Hub	11 ft. lbs.
Lower Ball Joint	111 ft. lbs.
Upper Ball Joint	85 ft. lbs.
Tie Rod End Ball Stud	85 ft. lbs.
Tie Rod Jam Nut	76 ft. lbs.

Front Components (continued)

Axle Shaft	20 ft. lbs.
Dust Shield to Steering Knuckle	12 ft. lbs.
Brake Caliper to Steering Knuckle	175 ft. lbs.
Brake Line Bracket	12 ft. lbs.
Sway Bar Drop Bracket RS176746B	35 ft. lbs.
Sway Bar End Link	59 ft. lbs.
Wheel Lug Nuts	150 ft. lbs.

Rear Components

Brake Hose Drop Bracket RS176314	12 ft. lbs.
Parking-Brake Cable Drop Bracket RS176748	12 ft. lbs.
Driveshaft to Pinion Flange	75 ft. lbs.
Leaf Spring U-bolt	85 ft. lbs.
Shock Absorber	66 ft. lbs.
Wheel Lug Nuts	150 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 D T L X G = Grade Marking (bolt strength) L = Length (inches) D = Nominal Diameter (inches) X = Description (hex head cap screw) T = Thread Pitch (threads per inch)			M12-1.25x50 HHCS D T L X P = Property Class (bolt strength) L = Length (millimeters) D = Nominal Diameter (millimeters) X = Description (hex head cap screw) T = Thread Pitch (thread width, mm)		
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