INSTALLATION INSTRUCTION 89555

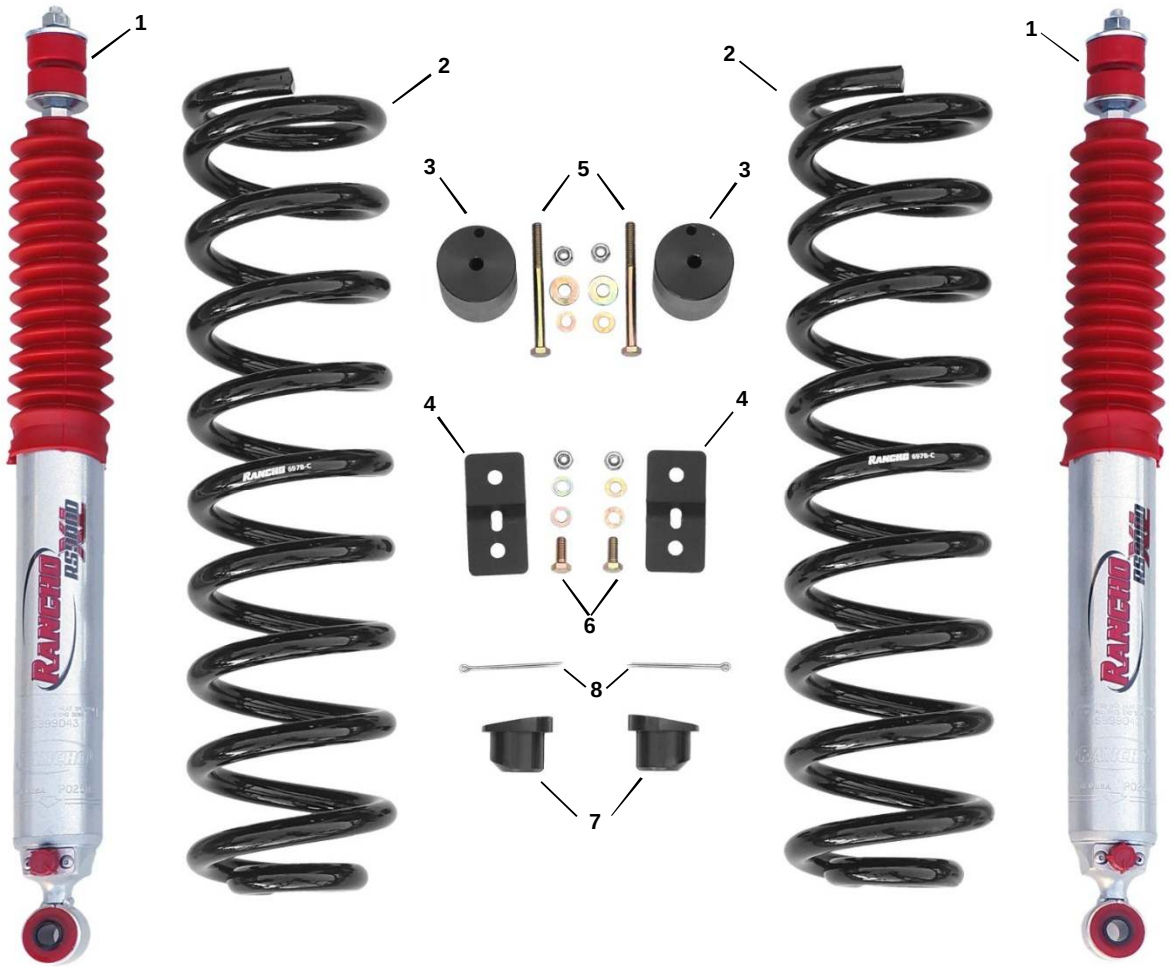
Rev A

Rancho Suspension Systems **RS66555R9**

2017-2011 Ford F250 / F350 Super Duty 4x4 2 ½" Leveling Kit

Includes Rancho RS9000XL Front Shock Absorbers

DIESEL ONLY — Not compatible with gasoline engines due to exhaust clearance issues



PARTS LIST

ITEM	PART #	DESCRIPTION	QTY
1	RS999043	Rancho RS9000XL Shock	2
2	RS697B	Coil Spring	2
3	RS176322	Bump Stop Spacer	2
4	RS176420	Brakeline Drop Bracket	2
	RS860840	Sub Assy, Hardware	1
5	RS770124	HHCS M8-1.25X95MM GR 10.9	2
	RS603112	Nut M8-1.25 Nylock	4
	RS7733	Washer 5/16 USS	2
6	RS770127	HHCS M8-1.25X20MM GR 10.9	2
	RS770128	Washer M8	6
	RS42702	Thread Lock	2

ITEM	PART #	DESCRIPTION	QTY
	RS860839	Sub Assy, Alignment Sleeve	1
7	RS770296	Alignment Sleeve, +2.3 Cas/+0.5 Cam	2
8	RS770297	Cotter Pin, 1/8" X 2.50", Zinc	2
	RS94180	Information Pack	1
	RS89555	Instructions	1
	RS94177	Rollover Warning Label	1
	RS94119	Consumer/Warranty Information	1
	R-RM0082-1112	Warranty Tag	1
	RS780281	Rancho Decal - Color	1
	RS780294	Red Rancho Die Cast Decal	1
	RS780294B	Black Rancho Die Cast Decal	1

⚠ 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: BFGoodrich® All-Terrain 35x12.5R17/D tire, 17" wheel with 6.25"

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 accordantly.

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.

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.

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 front Rancho shock absorbers must be used with this kit.

RS999043 front shock absorbers are included.

New Ranch rear shock absorbers are recommended and can be purchased separately

Do not reuse OE front shock absorbers.

⚠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 2017-2011[1]	REAR 2016-2011[2]	REAR 2017[2]
RS999043[3]	RS999254XL	RS999047A
RS7043	RS7254	
RS55043	RS55254	RS55047A
RS5043	RS5254	

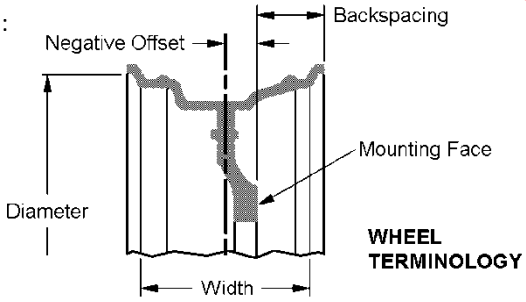
[1] Required
[2] Optional
[3] Included

Wheels and Tires

This suspension system was developed using the following tire & wheel combination:
Tire: BF Goodrich® All-Terrain T/A® KO2 35X12.50R17
Wheel: 17" X 9" wheel with 6.25" of backspacing.

Compatible With OE Wheels	Development Tire Size (Actual)	Wheel Size (Backspacing)
Yes[1] 17" wheel and up only	35X12.50R17	17X9 (6.25")

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



WHEEL TERMINOLOGY

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

Ford Service Manual
Alignment Sleeve Puller - OTC 7588A
or 2-Jaw Puller
Heavy Duty Jack Stands
Wheel Chocks (wooden blocks)
Hydraulic Floor Jack
Torque Wrench (250 FT-LB capacity)
1/2" Drive Ratchet and Sockets
Assorted Combination Wrenches
Hammer
Pliers
Wire Brush (to clean bracket mounting surfaces)
Penetrating Lubricant
Tape Measure
Safety Glasses--
Wear safety glasses at all times

VEHICLE PREPARATION & SWAY BAR REMOVAL

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

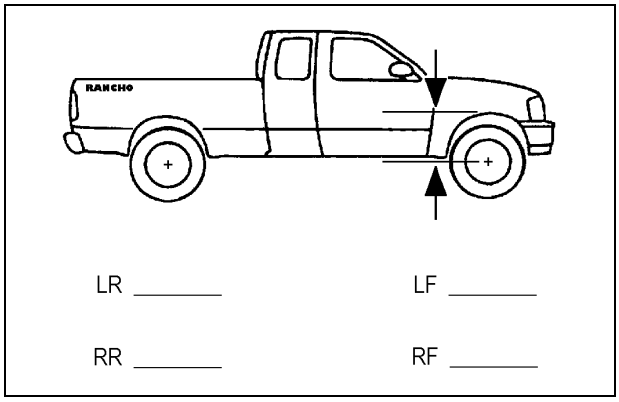


Illustration 1

2) ☐ Raise the front of the vehicle and support the frame with jack stands. Remove the front wheels and set them aside.

3) ☐ Remove the sway bar end links from the sway bar. See Illustration 3.

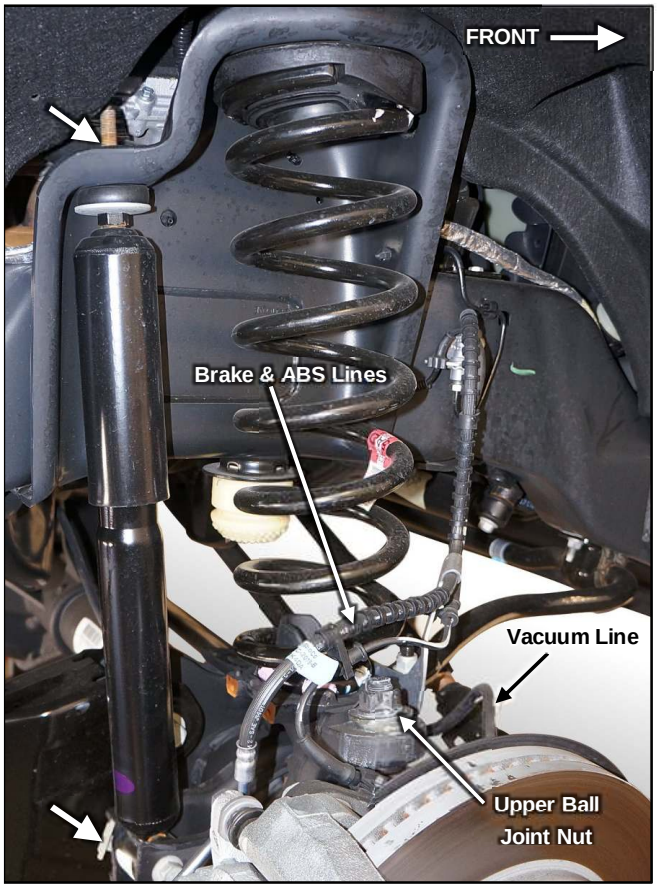


Illustration 2

NOTE: Attachment and routing of various hoses, wires and lines varies depending on year and model. Use the following as a guide, but make sure to disconnect or detach any line that may get damaged when lowering axle.

4) ☐ Disconnect the vacuum hose from the axle hub. Disconnect clips holding vacuum line to axle, radius arm and frame as required.

5) ☐ Disconnect the brake hose bracket from the frame and lower spring seat.

6) ☐ Disconnect clips holding ABS sensor wire to the radius arm and spring seat as required.

7) ☐ Disconnect vent hose from axle.

COIL SPRING REMOVAL

1) ☐ Support the front axle with two floor jacks, one under each coil spring.

2) ☐ Remove the front shock absorbers.

3) ☐ Carefully lower the axle enough to relieve the tension on the coil springs.

⚠ **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.**

4) ☐ Remove coils and upper isolators.

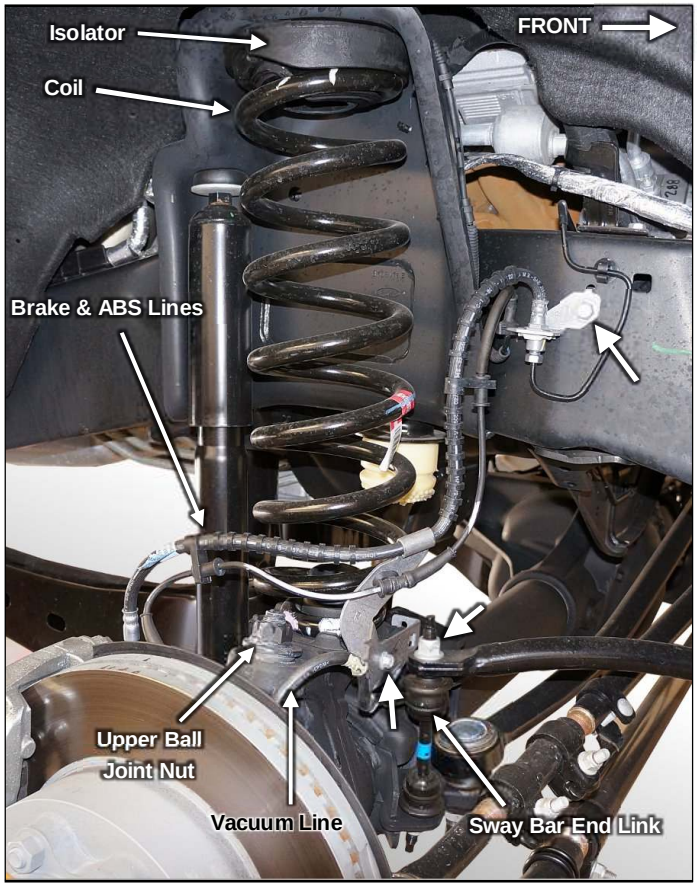


Illustration 3

BUMP STOP SPACER INSTALLATION

1) ☐ Remove bump stop from frame bracket. Remove bracket from frame rail. See Illustration 4.

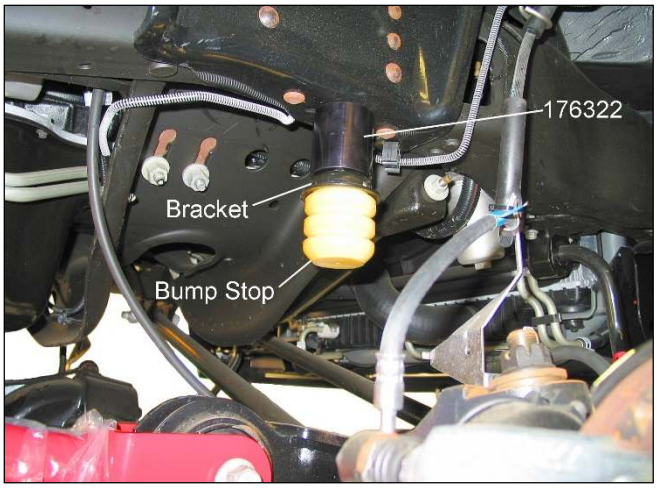


Illustration 4

2) ☐ Insert spacer RS176322 between frame rail and bracket. See Illustration 4. Align tab on bracket with hole in spacer. Attach bump stop bracket to spacer and frame rail with the M8 x 95mm bolt and smaller washer from kit RS860513. Torque to 18 lb-ft.

3) ☐ On earlier models, install the larger washer and 8mm nut on top. Torque to 18 lb-ft.

4) ☐ Insert bump stop into bracket.

5) ☐ Repeat steps 1 through 4 for the other side.

ALIGNMENT SLEEVE INSTALLATION

1) ☐ Remove cotter pin and castle nut from upper ball joint stud. Refer back to Illustration 2 and Illustration 3.

2) ☐ Use puller to remove alignment sleeve. See Illustration 5.

Illustration 5

NOTE: If sleeve is frozen in axle "C", try using penetrating oil and striking the axle "C" with a hammer. In extreme cases the entire knuckle will have to be removed to extract the sleeve. See Ford service manual for removal and re-installation of knuckle.

3) ☐ Clean sleeve mounting surface of any contamination (lube, dirt, corrosion).

4) ☐ Install new alignment sleeve RS770296. The slit of the sleeve goes to the rear. Align flat of sleeve flange with flat step on the axle "C". See Illustration 6.

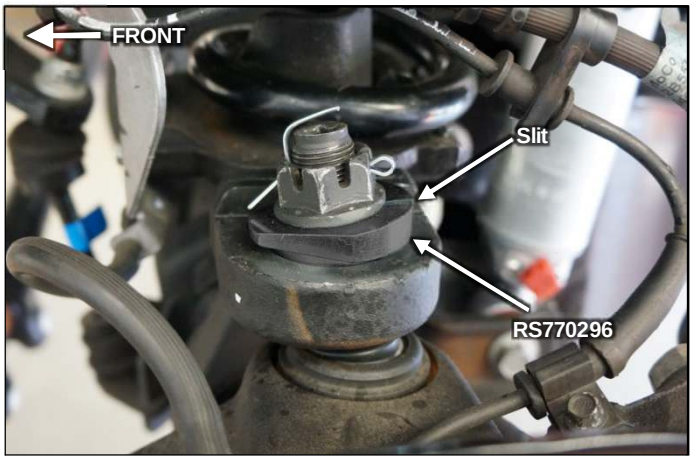


Illustration 6

5) ☐ Install castle nut and torque to 69 lb-ft. Install cotter pin. If cotter pin hole does not line up with castle nut, tighten nut until cotter pin can be installed.

DO NOT LOOSEN NUT TO INSTALL COTTER PIN

COIL SPRING INSTALLATION

1) ☐ Install original rubber isolator on top of new coil spring RS697B.

2) ☐ Insert coil spring assembly into upper mount and onto front axle. Align pigtail on lower spring seat.

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

4) ☐ Carefully raise axle until springs are snug. Install new front shock absorbers RS99043. Torque upper mount to 46 lb-ft., or until bushings swell larger than retainer washers. Torque the lower mounting hardware to 100 lb-ft.

BRAKE LINE BRACKET INSTALLATION

1) ☐ Reattach the brake line brackets to the lower spring seats.

2) ☐ Attach brake hose to drop bracket RS176420 with the 8mm hardware from kit RS860840. Align the OE brake hose bracket in the original position, with the anti-rotation tab either to the side or above the mounting hole. See Illustration 7 and Illustration 8.

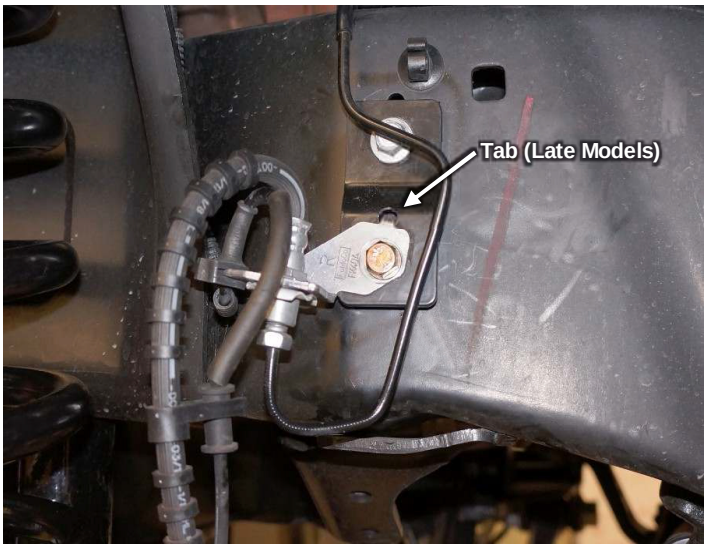


Illustration 7

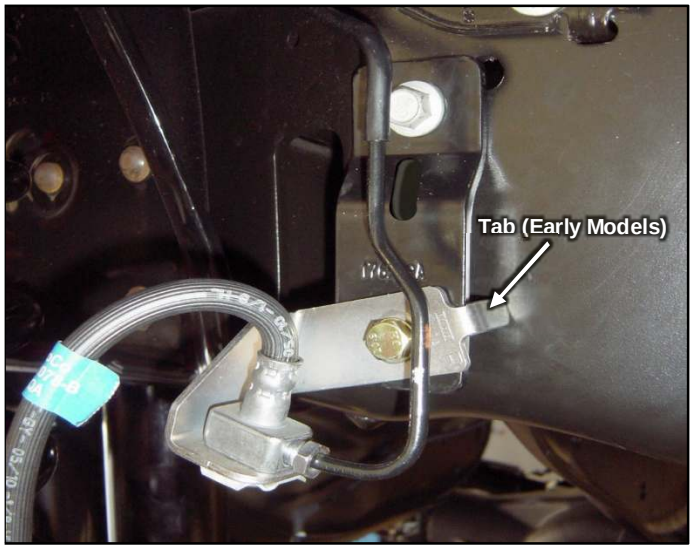


Illustration 8

3) ☐ Using the original bolt and location, attach brake hose drop bracket RS1765420 to the frame rail. Torque hardware to 18 lb-ft.

4) ☐ Reconnect the vacuum hose to the axle hub. Reattach clips to axle, radius arm and / or frame. If required use wire ties to attach vacuum line to radius arm

NOTE: Readjust vacuum hose clips as necessary.

5) ☐ Reconnect the ABS wire clips. If required use wire ties to attach ABS line to radius arm.

6) ☐ Reattach sway bar end links to sway bar. Torque to 32 lb-ft.

7) ☐ Install front wheels and lower the vehicle to the ground. Tighten lug nuts to 165 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 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.

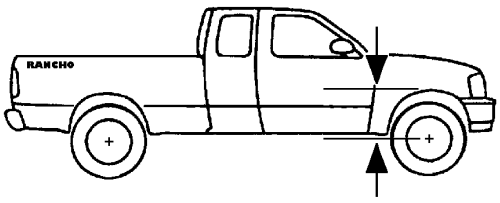
Recommended Alignment Specifications

Caster (degrees): (L) 3.5° (R) 3.8° ± 1.2°

Camber (degrees): .15° ± .75°

Sum Toe In (degrees): .1° ± .2° (.05" ± .13")

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 _____

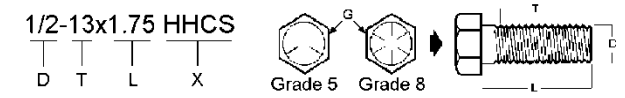
RR _____ RF _____

Please retain this publication for future reference.

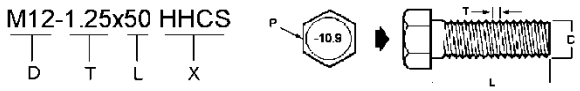
Torque Specifications

Bump Stop Mount	18 lb-ft.
Upper Ball Joint Nut	69 lb-ft.
Shock Upper Mount	46 lb-ft.
Shock Lower Mount	100 lb-ft.
Brake Line Drop Bracket	18 lb-ft.
Wheel Lug Nuts Steel Wheel	165 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



G = Grade Marking (bolt strength)
D = Nominal Diameter (inches)
T = Thread Pitch (threads per inch)
L = Length (inches)
X = Description (hex head cap screw)



P = Property Class (bolt strength)
D = Nominal Diameter (millimeters)
T = Thread Pitch (thread width, mm)
L = Length (millimeters)
X = Description (hex head cap screw)

Learn more about performance suspension parts we have.