INSTALLATION INSTRUCTION RS84511-1

Rev A

RS70511 – Rancho Rear Upgrade Kit
Fits 2023-2021 Ford F150 4WD ONLY*

RS66512R9K – 3” Suspension System
Use this instruction for rear components RS66512R9-3.
For front components RS66512R9-1 and RS66512R9-2, use instruction RS84511
Fits 2023-2021 Ford F150 4WD ONLY*

*Excludes SVT Raptor, Tremor, Continuously Controlled Damping (CCD) Adaptive Suspension

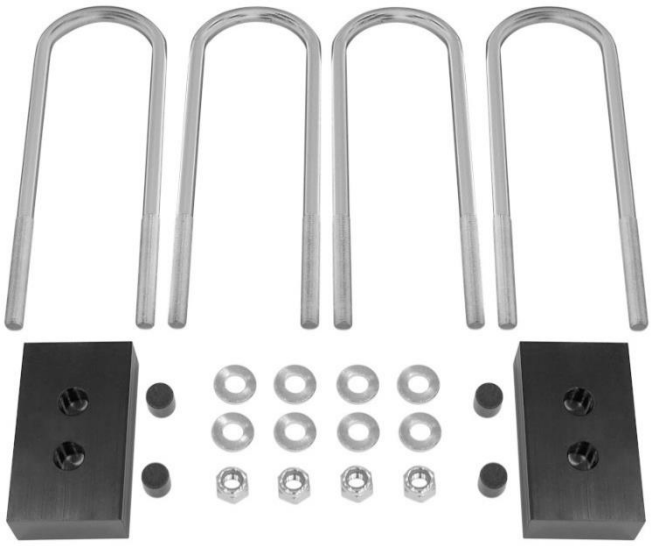
READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION

⚠ WARNING:

Advanced driver-assistance systems (ADAS) are electronic systems in a vehicle that use advanced technologies to assist the driver. Installation of a Rancho lift kit in any vehicle that features this technology may impact or change the ADAS system and requires immediate re-calibration by the dealer. This product warranty is voided if the vehicle’s ADAS systems are not re-calibrated by a qualified technician after kit installation

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



P/N	DESCRIPTION	QTY.
RS15115	Rear 1.50" Riser Block	2
RS860873	Sub Assy, Riser Block Pin	1
RS10503	Pin, .75"D X .785"L	4
RS740034	U-Bolt, 9/16-18 X 3.78" X 11.25" Radiused	4
RS860152	Sub Assy 9/16 U-Bolt	1
RS770062	Washer, 9/16 USS Thick	8
RS7737	Nut 9/16-18 Nylock Gr 8	8
RS84511-1	Instructions	1
RS94180	Information Pack	1
RS94177	Rollover Warning Label	1
RS94119	Consumer/Warranty Information	1
RS780281	6" Rancho Decal - Color	1
RS780294	Red Rancho Die cut Decal	1
RS780294B	Black Rancho Die cut Decal	1

Included with RS66512R9-3

RS999073	RS9000XL Rear Shock Absorber	2

Optional Modifications *MUST BE PURCHASED SEPARATELY)*

Rancho quickLIFT and LEVEL IT front struts –
Lifts the front of the vehicle by 2” – 2.5” while improving factory ride.
Rancho Rear Shocks – Improves ride and performance.
Rancho Upper Control Arm Upgrade Kit –
Corrects caster and ball joint angle on vehicles using a strut spacer or lifted shock.

LEVEL IT Kit	RS66511R9
Rear Shock Absorber	RS999073
Upper Control Arm Upgrade	RS64511

Please consult your Ranch dealer for correct applications. Component part number listing for 4WD only.

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

Ford Service Manual
Torque Wrench (150 FT-LB capacity)
1/2” Drive Ratchet and Sockets
Assorted Combination Wrenches
Assorted Metric Allen Wrenches
Rubber Mallet
File
Hammer
Heavy Duty Jack Stands
Wheel Chocks (wooden blocks)
Hydraulic Floor Jack
Wire Brush (to clean bracket mounting surfaces)
Penetrating Spray Lubricant
Tape Measure
Safety Glasses--
Wear safety glasses at all times
Red LocTite

1) Park the vehicle on a level surface. Set the parking brake and chock front wheels.

2) Measure and record the distance from the center of each wheel to the top of the fender opening. See Illustration 1.

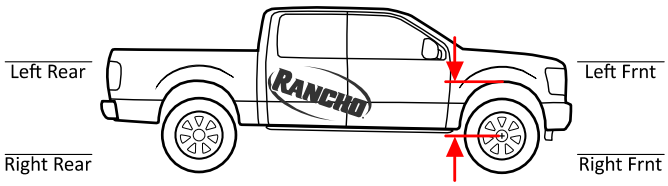


Illustration 1

3) Raise the rear of the vehicle and support the frame with jack stands. Remove the rear wheels.

4) Support the rear axle assembly with a floor jack.

5) Remove both rear shock absorbers.

6) Loosen the U-bolt nuts on both sides of the vehicle 2 turns.

7) Remove the driver side U-bolts only. Carefully lower the rear axle and remove the original riser block. See Illustration 2.

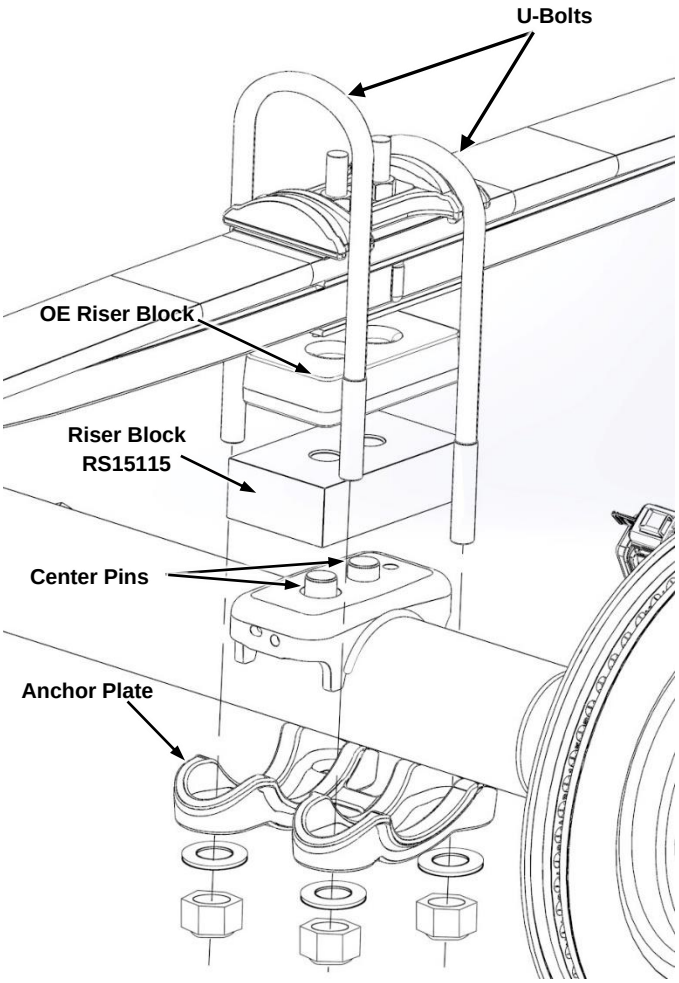


Illustration 2

⚠ 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.

8) Insert center pins from kit RS860873 into holes in axle pad.

9) Place riser block RS15115 on the axle pad.

10) Reinstall the original riser block on top of riser block RS15115.

11) Loosely attach the leaf spring to the axle with new U-bolts RS740034 and the hardware from kit RS860152.

12) Repeat steps 7 – 11 for the passenger side.

13) Tighten all U-bolt nuts in a cross pattern in 3 stages: 40, LB-FT, 60 LB-FT, 90 LB-FT.

14) Install shocks and torque to 66 LB-FT.

(New Rancho shock absorbers recommended)

15) Install rear wheels.

16) Verify adequate tire, wheel, and brake hose clearance. Inspect steering and suspension for tightness and proper operation.

17) 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.

18) Lower vehicle to ground.

19) Tighten lug nuts to 150 LB-FT.

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) Ensure that the vehicle brake system operates correctly.

3) Readjust headlamps and have vehicle aligned at a certified alignment facility.

NOTE: Alignment cam kit may be required to align vehicle.

Recommended Alignment Specifications

Caster (degrees): 5.2° ± .75°

Camber (degrees): -0.10° ± 0.75°

Sum Toe In (degrees): 0.2° ± 0.2° or 0.10” ± 0.10”

4) Park the vehicle on a level surface. Set the parking. Measure and record the distance from the center of each wheel to the top of the fender opening. See Illustration 3.

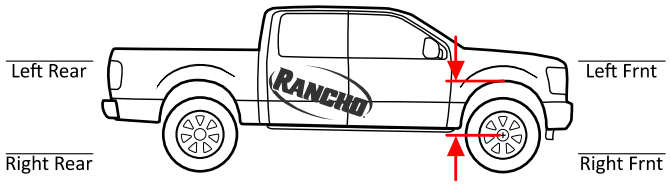


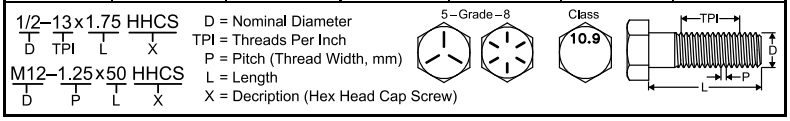
Illustration 3

VEHICLE BOLT TORQUE

Leaf Spring U-bolt (Cross Tighten in 3 Stages)	40 LB-FT. 60 LB-FT. 90 LB-FT.
Shock Absorbers	66 LB-FT.
Wheel Lug Nuts	150 LB-FT

STANDARD BOLT TORQUE AND 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



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).

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 substitute Rancho components with components manufactured by other companies. Use of other components will result in the forfeiture of any type of warranty on the vehicle/suspension system. Some components required for the installation of this kit may need to be purchased separately.

C. 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.

D. Each hardware kit in this system contains fasteners of high strength and specific size. Do not mix hardware kits or substitute a fastener of lesser strength. See bolt identification table at end of instruction.

E. Compare the contents of this system with the parts list in these instructions. If any parts are missing, contact the Rancho Technical Department at 1-734-384-7804.

F. Install all nuts and bolts with a flat washer. When both SAE (small OD) and USS (large OD) washers are used in a fastener assembly, place the USS washer against the slotted hole and the SAE washer against the round hole.

G. Apply a drop of thread locking compound to all bolts during installation. ⚠ CAUTION: Thread locking compound may irritate sensitive skin. Read warning label on container before use.

H. Unless otherwise specified, tighten all nuts and bolts to the standard torque specifications shown in the table at end of instruction. USE A TORQUE WRENCH for accurate measurements.

I. 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 tool list

J. 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.

K. 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.

L. The required installation time for this system is approximately 2 to 3 hours for two people. Check off the number 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.

N. Important information for the end user is contained in the consumer/installer information pack. If you are installing this system for someone else, place the information pack on the driver's seat. Please include the installation instructions when you finish.

O. 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.

⚠ 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.

RANCHO®

Rancho Technical Department 1-800-325-8886

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: 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.

5) 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.

6) 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 kit improperly and will be creating a significant risk of an accident. In case of any doubt, consult a qualified mechanic.

7) If any component does not fit properly, something is wrong. You are installing the 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.

8) 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.

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

10) 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.

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

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

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

14) 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.

15) 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.

16) 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

17) 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.

18) 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.

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

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

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

22) 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

23) 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.

The driver of this suspension system recognizes and agrees that there are risks inherent in driving a vehicle with a modified 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.