



RS64501 – Upper Control Arm Upgrade Kit

Fits 2020-2009 Ford F150 4WD & 2WD, Excludes SVT Raptor

RS66507R9-2 – 3" Suspension System (Box 2 of 3)

Fits 2020-2014 Ford F150 4WD ONLY, Excludes SVT Raptor

READ ALL INSTRUCTIONS THOROUGHLY FROM START TO FINISH BEFORE BEGINNING INSTALLATION
IF INSTALLING RS66507R9 OR ANY ADDITIONAL COMPONENTS READ ALL ADDITIONAL INSTRUCTIONS
BEFORE BEGINNING INSTALLATION

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.



Parts List

P/N	DESCRIPTION	QTY.
RS176894B	UCA Left	1
RS520113	Bushing, K200353 (pre-installed)	2
RS602643	Upper Ball Joints, K80014 (pre-installed)	1
	Grease Fitting (1/4 SAE-LT)	1
	Castle Nut M14-1.5	1
	Cotter pin	1
RS176895B	UCA Right	1
RS520113	Bushing, K200353 (pre-installed)	2
RS602643	Upper Ball Joints, K80014 (pre-installed)	1
	Grease Fitting (1/4 SAE-LT)	1
	Castle Nut M14-1.5	1
	Cotter pin	1

P/N	DESCRIPTION	QTY.
RS176950	Shock Spacer, 1/4"	2
P01141	Parts Package	2
113900067	Nut - M10 X 1.5	3
RS84501	Instructions	1
RS94180	Information Pack	1
RS94177	Rollover Warning Label	1
RS94119	Consumer/Warranty Information	1
RS780281	6" Rancho Decal - Color	1
R-RM0082-1112	Warranty Tag	1
RS780294	Red Rancho Die cut Decal	1
RS780294B	Black Rancho Die cut Decal	1

Required Modifications MUST BE PURCHASED SEPARATELY

Rancho Upper Control Arms RS176894B and RS176895B are designed to be used with Rancho Quick Lift and Level It front struts. These control arms will correct the caster and camber of a vehicle with 2-3.5" of lift, allowing for a range of adjustment to achieve desired handling. When using larger tires, it is recommended to adjust caster to the higher end of the spec, or a little over the specification.

Use on an OE height vehicle may damage upper ball joints, and make it difficult or impossible to achieve proper wheel alignment.

4WD LEVELING KITS

	2020-2015	2014	2013-2009
LEVEL IT Kit	RS66504R9	RS66504R9	RS66503R9
QuickLIFT Loaded	Left	RS999946	RS999946
	Right	RS999945	RS999945
		RS999935	RS999911

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

Wheels and Tires

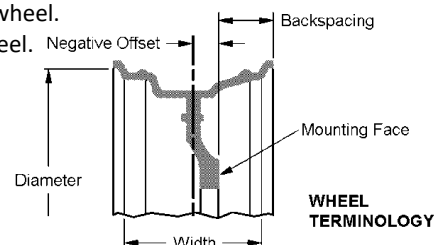
This suspension system was developed using the following tire & wheel combinations:

- 1-Toyo Open Country AT II 285/65R20 (32.1"x10.8") on 20 x 9, +12 offset (5.5" backspacing) wheel.
- 2-General Grabber AT2 275/65R18 (32.5x10.7) on OE 18 x 7.5 +44 offset (6" backspacing) wheel.

Fits up to 295/70R18 (34.3X11.6) or 285/65R20 (34.6x11.2) on 9" wide 5.5" backspacing wheel with trimming.

OE wheel is compatible with stock and recommended size tires only.

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



Optional Modifications MUST BE PURCHASED SEPARATELY

Rancho Rear Shocks – Improves ride and performance.

Rancho Rear Upgrade Kit RS70501 – If you would like to keep some of the original rake of the vehicle (higher in the rear), Rancho Rear Upgrade Kit RS70501 can be installed to gain 1.5" lift in the rear of the vehicle.

Rancho Alignment Cam Kit RS886509 – Allows Adjustment of front-end alignment.

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

	2020-2015	2014	2013-2009
Rear Shock Absorber	RS999316	RS999384	RS999384
	RS7316	RS7384	RS7384
	RS55316	RS55384	RS55384

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

- | | | |
|------------------------------------|---|--|
| Ford Service Manual | Rubber Mallet | Silicone Spray Lubricant |
| Torque Wrench (260 FT-LB capacity) | File | Tape Measure |
| Ball Joint Puller | Hammer | Safety Glasses-- |
| 1/2" Drive Ratchet and Sockets | Heavy Duty Jack Stands | Wear safety glasses at all times |
| Assorted Combination Wrenches | Wheel Chocks (wooden blocks) | Red LocTite |
| Assorted Metric Allen Wrenches | Hydraulic Floor Jack | Grease Gun with NLGI 2 GC-LB Lithium Complex Grease* |
| | Wire Brush (to clean bracket mounting surfaces) | |

*NOTE: Rancho components come lubed with lithium or lithium complex grease. Use of a different type (base) of grease can cause grease separation and breakdown of the grease and cause the component to fail.

Instruction Notes

These instructions cover multiple generations of vehicles. Be sure to follow the correct procedure for your vehicle.

Removal of the OE struts / shocks on 2014+ models requires additional steps because of the pressed-in studs in the lower mount. Follow the correct procedure for your shocks.

1/4" Shock Spacer RS176950 is only for use with Rancho quickLIFT, quickLIFT LOADED, and LEVEL IT systems. It provides an additional 1/2" of lift. Use of RS176950 is optional.

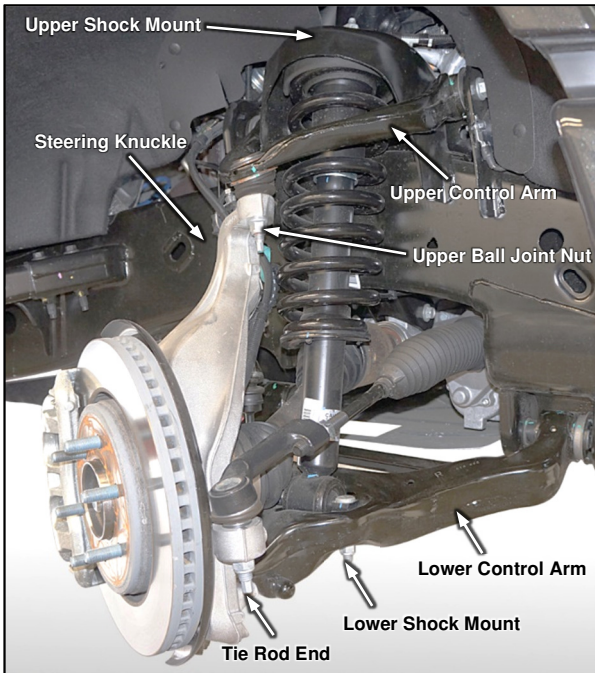


Illustration 1

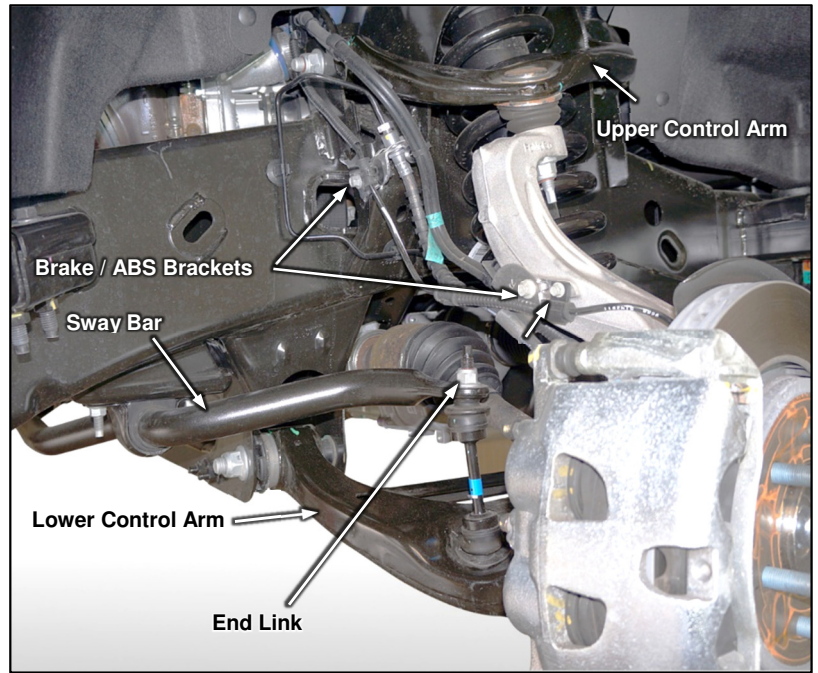


Illustration 2

STRUT REMOVAL

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

2) Measure and record the distance from the center of each wheel to the top of the fender opening. See Illustration 3.

Note: This measurement is required later in the installation.

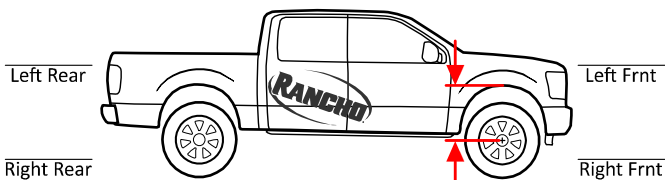


Illustration 3

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

4) Disconnect sway bar at end links. Push bar up off end links See Illustration 2.

5) Remove brake hose and ABS wire brackets from steering knuckle and frame. See Illustration 2.

6) Loosen outer tie rod stud nut. Using appropriate puller, separate then remove tie rod stud from steering knuckle. See Illustration 1.

7) Support lower control arm with jack.

8) Remove upper strut mounting nuts. Loosely re-install one of the upper strut mounting nuts. See Illustration 1.

CAUTION: Do not turn center strut rod nut!

9) Remove lower strut mounting nuts and bolts (if equipped). See Illustration 1.

NOTE: The lower control arm bushings must be “re-set” to eliminate tension on them at the new ride height. The vehicle will ride lower than expected and bushings will fail prematurely if lower control arm mounting hardware is not loosened and re-torqued at the new ride height.

10) Mark location of lower control arm mounting bolts in the frame slots, or if equipped, mark location of alignment cams.

11) Loosen lower control arm mounting bolts until lower control arm bushing can move freely in frame mounts.

If lower mount of shock is attached with studs (2014+ OE), follow step 12.

If lower mount is attached with bolts (Aftermarket and 2009-2013 OE), skip to step 15

12) Remove lower control arm mounting bolts. Lower jack and swing lower control arms down and out of frame mounts and off strut mounting studs. See Illustration 4.

NOTE: Studs may need to be pried out of control arm.

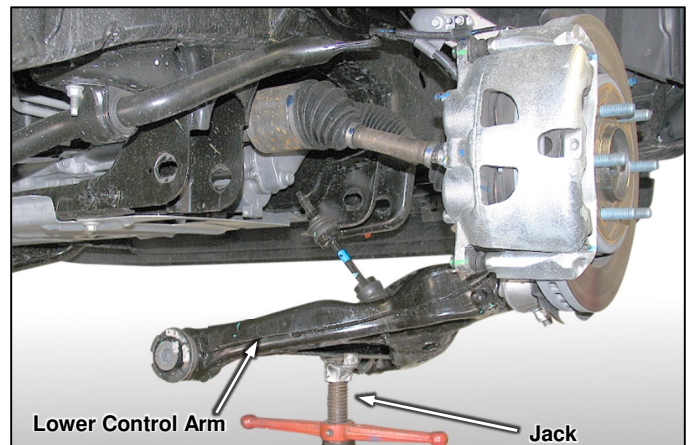


Illustration 4

13) Remove strut from vehicle.

14) Raise jack and reinstall lower control arm. Loosely re-attach lower control arm to frame mounts using OE hardware or cam bolts and bracket from optional Rancho alignment cam kit RS886509.

15) Loosen but do not remove upper ball joint stud nut. If required, use puller to separate upper ball joint stud from steering knuckle. See Illustration 1.

⚠ WARNING: CONTROL ARM WILL SPRING UP WITH GREAT FORCE WHEN BALL JOINT SEPARATES FROM KNUCKLE. WHEN REMOVING BALL JOINT STUD NUT, USE PRY BAR TO HOLD DOWN CONTROL ARM AND SLOWLY LIFT BALL JOINT STUD OUT OF KNUCKLE.

16) Pry down on upper control arm, remove ball joint nut, and slowly release upper control arm to remove ball joint stud from knuckle.

17) Remove strut from vehicle if required.

UPPER CONTROL ARM REPLACEMENT

1) Remove upper control arm mounting bolts and remove control arm. Refer back to Illustration 1 and Illustration 2.

2) Loosely install new Rancho upper control arm to frame brackets using OE hardware. See Illustration 5.

RS176894B is the driver side arm, and RS176895B is the passenger side. The ball joint is offset toward the rear of the vehicle when installed correctly.

3) Loosely attach upper ball joint to steering knuckle.

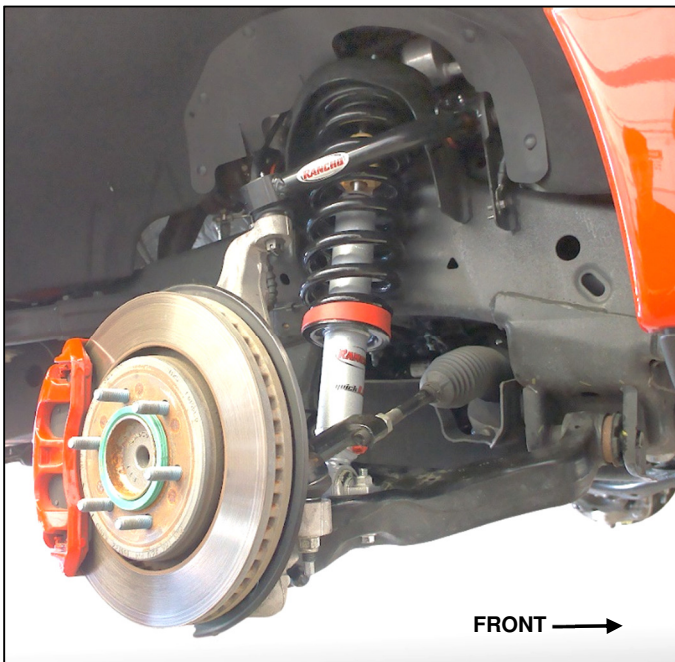


Illustration 5

4) Use jack to raise lower control arm until the spindle to fender measurement is 2.5" greater than OE measurement from step 2. If a quickLIFT or Level It strut was previously installed, the spindle to fender measurement should be 1/2" greater than the measurement from step 2.

5) Align lower control arm bolts with previously made marks and torque to 240 lb-ft.

6) Torque upper control arm mounting hardware to 111 lb-ft.

7) Remove upper ball joint nut from steering knuckle and lower jack until stud is clear of knuckle.

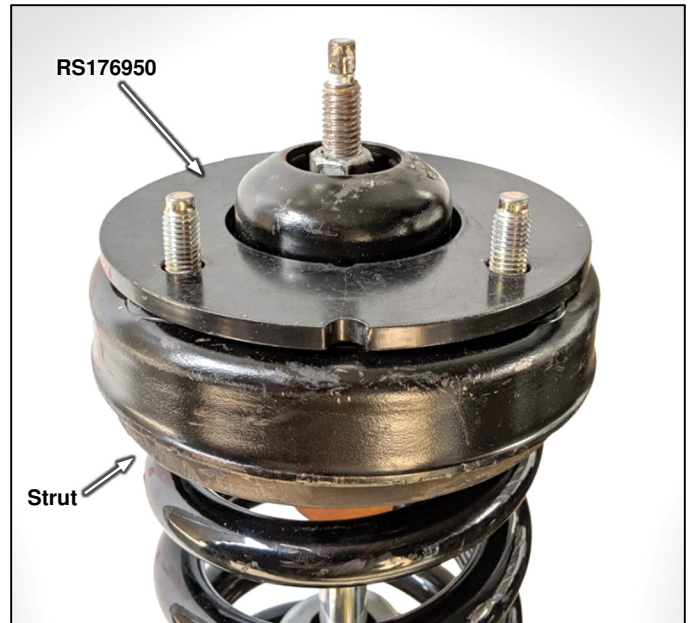


Illustration 6

STRUT REPLACEMENT

IF INSTALLING RS66507R9 RS66504R9, OR RS66503R9 FOLLOW INSTRUCTION RS89504 OR RS86503 TO INSTALL OE COIL ON NEW STRUT.

⚠ WARNING: If installing new strut, follow instructions and warnings supplied with strut

1) If using 1/4" shock spacer RS176950, place on top of strut's upper mount. See Illustration 6.

2) Install strut in upper frame mount and loosely attach with nuts. If using shock spacer RS176950, use nuts from parts pack P01141.

Note: OE nuts will not fully thread onto studs with Shock Spacer RS176950 installed.

3) Pry lower strut mount into position and attach to lower control arm. Lower jack under the control arm if needed.

NOTE: ON 2014+ 4WD MODELS, The lower rear strut bolt must be installed with threads toward the bottom (nut on the bottom of the control arm) for CV boot clearance.

CAUTION: Take care not to damage CV boot.

4) Torque upper mounting hardware to 46 lb-ft.
2014+ MODELS: Torque lower mounting hardware to 66 lb-ft.
2013-2009 MODELS: Torque lower mounting hardware on the ground at ride ht.

5) Pry down upper control arm and attach upper ball joint stud to steering knuckle using supplied castle nut hardware. Torque nut to OE spec. and install cotter pin. If required TIGHTEN nut to align cotter pin hole.

DO NOT LOOSEN NUT TO INSERT COTTER PIN!

6) Grease ball joint just until boot starts to swell. Do not over-grease.

7) Attach outer tie rod end to steering knuckle with OE hardware. Torque nuts to OE spec.

8) Re-install brake hose and ABS wire brackets in original locations.

9) Re-attach sway bar end links and torque to 59 lb-ft.

LOWER VEHICLE

- 1) Install front wheels.
- 2) Turn the front wheels completely left then right. Verify adequate tire, wheel, brake hose clearance. Check for proper CV axle operation and clearance. Inspect steering and suspension for tightness and proper operation.
- 3) Inspect and rotate all axles and drive shafts.
- 4) Lower vehicle to ground.
- 5) Tighten lug nuts to 150 ft. lbs.
- 6) 2013-2009 MODELS: Torque lower strut mounting hardware to 406 lb-ft.

FINAL CHECKS & ADJUSTMENTS

- 1) Turn the front wheels completely left then right. Verify adequate tire, wheel, brake hose clearance. Check for proper CV axle operation and clearance. Inspect steering and suspension for tightness and proper operation.
- 2) Inspect and rotate all axles and drive shafts.
- 3) Ensure that the vehicle brake system operates correctly.
- 4) 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): $3.60^{\circ} \pm 1.00^{\circ}$

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

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

- 5) 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 7.

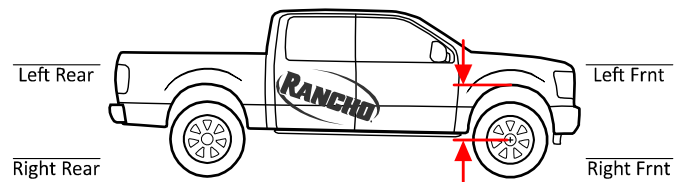


Illustration 7

VEHICLE TORQUE AND IDENTIFICATION

	2014 – Later	2013-2009
Lower Control Arm	240 lb-ft.	240 lb-ft.
Strut Rod Nut	41 lb-ft.	41 lb-ft.
Upper Strut Mounting Nuts	30 lb-ft.	30 lb-ft.
Lower Strut Mounting Bolts	66 lb-ft.	406 lb-ft.
Tie Rod End Ball Stud Nut	76 lb-ft.	85 lb-ft.
Upper Ball Joint Nut	46 lb-ft.	85 lb-ft.
Sway Bar End Links	59 lb-ft.	59 lb-ft.
Sway Bar Mounting Bolts	41 lb-ft.	41 lb-ft.
Wheel Lug Nuts	150 lb-ft.	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

5-Grade-8

1/2-13 x 1.75 HHCS

D = Nominal Diameter
TPI = Threads Per Inch
P = Pitch (Thread Width, mm)
L = Length
X = Description (Hex Head Cap Screw)

10.9 Class

M12-1.25 x 50 HHCS

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.
- 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.
- 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.

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.

- 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 kit 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 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.

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 DRiV, Inc. and its related companies harmless to the fullest extent permitted by law against any resulting damages.