



21401 Hemlock Ave. Lakeville, MN 55044

Congratulations on your purchase of Viking Crusader™ double adjustable struts!

**INSTALLATION / TUNING GUIDE FOR
VIKING CRUSADER™ DOUBLE ADJUSTABLE
FRONT STRUTS
[Part Numbers J3XX]**

⚠ WARNING: Cancer and Reproductive Harm - www.P65Warnings.ca.gov.

*Note: Struts are sold individually. Coil-over kit number 7904-102 is required for the strut to be utilized in a coil-over system. **WARNING: If a spring rate of less than 250 lbs. and/or a spring height taller than 12" is utilized in a coil-over setup, the spring may rub on the strut body which may result in spring failure and damage to the strut body.**

WARNING! (This warning does NOT apply to "CD" valving)
CRUSADER SERIES STRUTS ARE DESIGNED FOR COMPETITION ONLY AND NOT INTENDED FOR STREET USE. WHEN VEHICLE IS OFF-TRACK OR BEING TRAILED, CRUSADER STRUTS MUST BE AT VIKING'S SPECIFIED OFF-TRACK SETTINGS ON BOTH COMPRESSION AND REBOUND. FAILURE TO USE THE SPECIFIED SETTINGS MAY DAMAGE THE STRUT AND WILL VOID YOUR WARRANTY, AND MAY RESULT IN INJURY OR DEATH.

NOTE! Like many performance parts, aftermarket performance struts may make more noise than factory struts. Struts that have been installed are not eligible for return.

INSTALLATION

Please read these instructions carefully and entirely prior to installing your new Viking struts.

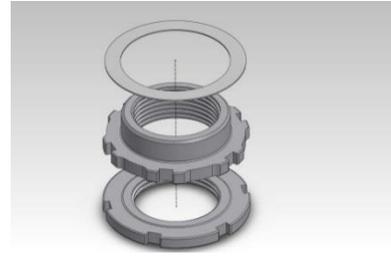
REMOVAL

1. Verify that the struts are the correct lengths and mount style before beginning installation. **Once they are installed they are not returnable.** Contact your chassis builder, supplier, or Viking with any questions.
2. If the current struts are coil-overs or you are converting to coil-overs, measure your vehicle's ride height by measuring from the center point of the fender lip down to the ground. Retain this measurement for later reference.
3. Reference your vehicle's owner's manual to determine the proper jacking locations, and the instructions for removing the struts and, if applicable, the springs. **FAILURE TO FOLLOW THE INSTRUCTIONS CAN RESULT IN SERIOUS INJURY OR DEATH.**
4. Jack your vehicle up until the tires do not touch the ground and the suspension hangs freely. Securely support the vehicle on jack stands. Remove the wheels. Remove the struts and the sway bar mounts, if applicable. Retain all factory mounting hardware. Make sure the brake lines and any ABS wiring, if applicable, have sufficient slack with the suspension at full extension. Disconnect or remove said components, supporting them accordingly, if necessary.

5. **Important:** Ensure that factory or replacement compression bumpers are in place and in good condition prior to installing the struts. Also check other chassis components such as bushings, ball joints, and other wear items. Replace if needed.
6. Use a floor jack to support the lower control arm, and lessen the load on the spindle and strut. If converting to coil-overs, use an approved method to safely and carefully remove the factory coil spring.
7. Loosen and remove the nuts and bolts, which secure the strut to the spindle. Loosen and remove the top mounting nut, and remove the strut assembly.
8. Remove and retain the dust boot and bump stop from the factory strut.

INSTALLATION

9. Fully extend the strut rod. If not being used as a coil-over, skip to step **14**.
10. Screw the lock nut (shoulder up) and the spring nut (shoulder up) down to the last thread (see picture to the right).
11. Apply anti-seize to the threads on the nuts and the strut. **If the Viking thrust bearing kit is used (recommended)**, coat both washers with anti-seize. Install the spring seat washer, then the bearing, then the second washer. Follow the same anti-seize procedure for the spring cap thrust bearing kit, which is used between the two caps. **If you do not use the thrust bearing kit**, then coat one side of the washer supplied with the strut with anti-seize and place it coated side down on the spring nut. **THE WARRANTY IS VOID AND DOES NOT COVER DAMAGE TO THE STRUT RESULTING FROM THE FAILURE TO APPLY ANTI-SEIZE PRIOR TO MAKING RIDE HEIGHT ADJUSTMENTS.**
12. Install the spring onto the strut.
13. Place the larger spring cap on the spring, and insert the anti-seize coated spring cap thrust bearing kit into the spring cap recess (place one washer in the recess first, then the bearing, then the second washer). Place the smaller spring cap on top of the spring cap thrust bearing kit.
14. If applicable, install the factory bump stop and dust boot. **IN SOME INSTANCES, SPACERS MAY BE REQUIRED ABOVE OR BELOW THE UPPER STRUT MOUNT, DEPENDING ON APPLICATION, STRUT CONFIGURATION, AND UPPER MOUNT.**
15. Guide the strut into place, and install the upper stud in the upper mount.
16. Install the lower strut mount onto the spindle, torquing the fasteners to factory specifications.
17. Verify the 3 socket head cap screws and nyloc nuts, which secure the strut mount to the strut body, are torqued to 25ft-lbs. If at any time the mount is loosened to adjust the strut mount on the strut body, it is recommended to install new 3/8-16 nyloc nuts, and not reuse the originals.
18. If applicable, reinstall the front sway bar mounts.
19. Reinstall any components which were removed to aid in the installation (ABS wiring, brake calipers, etc.), torquing them to factory specifications, if necessary.
20. Torque the upper strut mount nut to factory specifications.
21. Reinstall the front wheels, torquing the lug nuts in the appropriate pattern, to factory specifications. Place the vehicle back on level ground.



SETTING RIDE HEIGHT (COIL-OVER ONLY)

22. Verify that there is clearance around the coil-over strut and that the suspension does not bind, even with the wheels turned to the full lock position. Lightly bounce the vehicle at each corner to again confirm that there are no clearance issues, and to settle the suspension.
23. Measure the ride height as you did prior to installation and ensure that there is sufficient travel in both directions. Ideally, 60% of the strut stroke is available for compression. Adjust the ride height **only** with the weight of the vehicle fully off of the tires. **THE WARRANTY IS VOID AND DOES NOT COVER DAMAGE TO THE STRUT DUE TO INCORRECT RIDE HEIGHT AND/OR BY**

MAKING RIDE HEIGHT ADJUSTMENTS WITHOUT THE TIRES RAISED OFF THE GROUND. Raise or lower the ride height by adjusting the spring nut to achieve the desired ride height. If it is at the extreme top or bottom of the threads, then you may need a softer or heavier spring rate, or a different length.

24. Once ride height is correct, thread the lock nut up to the bottom of the spring nut and lock them together using the two spanner wrenches.
25. It is important that your **struts are never used as a travel limiter**. Straps or cables made for travel limitation should be used to prevent topping out. Vehicles used in a manner where they could bottom out the struts (such as drag racing) should use a higher rate spring and a bump stop to help prevent damage. Any strut can be damaged from wheel stands despite bump stops.
26. Have your front end realigned upon completion of installation.

TUNING AND ADJUSTMENT INSTRUCTIONS

Vehicles used on for drag racing, road racing and auto cross will all have different needs in terms of strut valving. However, it does not stop there. Driver style & capability, road & track conditions, vehicle type, vehicle weight, horsepower, and tires, among other variables, all create different needs in terms of strut valving. That is the beauty of a double adjustable strut. Your Viking Crusader™ struts have a total of 19 positions (18 clicks plus a zero position) of adjustment on compression and a total of 22 positions (21 clicks plus a zero position) of adjustment on rebound, for a total of 418 different valving combinations. Compression and rebound are independently controlled on Viking struts. The “C” knob adjusts compression, while the “R” knob adjusts rebound. Every Viking strut is tested on a dynamometer prior to shipment to ensure that it is functioning properly. Manually moving a strut is not an accurate testing method for ensuring that struts are functioning properly. Position 0 is the softest setting and is found by turning the knob counterclockwise until the positive stop is located. Only very light force is needed to adjust the knobs; do not ever force the knob past its intended stop as doing so will damage the strut.

Recommended baseline points for adjusting your shocks are outlined below based on the various shock Crusader™ valving options. Also, please consider the following:

Off Track (e.g. Trailing):

The rebound and compression settings must be at Viking’s specified off-track settings or lower when the vehicle is off-track, such as when it is being trailered or driven in the pit.

Handling (Autocross/Road Race):

The handling and autocross settings will vary depending on spring rate. For example, if very firm springs are utilized, the compression setting might be set softer and the rebound setting firmer. In addition, the track condition will also have an impact on the settings. For a rough track, it may be necessary to soften the rebound as the vehicle may skip across the track if you encounter a rough surface in a corner.

Drag Race:

For drag racing, a lot will depend on how the driver wants the car to react. Does the racer want to maximize weight transfer? If so, the front will be set with a stiffer compression and soft rebound, while the rear will have a soft compression and stiffer rebound. If the racer desires to limit weight transfer, the setting will go in the opposite direction. Track conditions will also impact the settings. For example, a hot slick track will often require stiffer compression and rebound. In addition, as a general rule of thumb, if the tires spin at the hit, soften the rebound. If the tires spin after the initial hook, stiffen the rebound (the compression can also be stiffened in this instance).

Cruising (“CR” kit) - Crusader™ “CD” Front

Off Track: Front (“CD”): 6 - 10 compression; 8 - 12 rebound

Crusader™ “AD” Front

Off Track:	Front (“AD”):	4 - 7 compression; 3 - 7 rebound
Handling:	Front (“AD”):	8 - 10 compression; 12 - 16 rebound
Drag Racing:	Front (“AD”):	10 - 14 compression; 0 - 4 rebound (weight transfer)

Crusader™ “AJ” Front

Off Track:	Front (“AJ”):	4 - 7 compression; 1 - 4 rebound
Handling:	Front (“AJ”):	8 - 10 compression; 8 - 12 rebound
Drag Racing:	Front (“AJ”):	8 - 10 compression; 13 - 17 rebound (front tie-down)
Drag Racing:	Front (“AJ”):	10 - 14 compression; 0 - 4 rebound (weight transfer)

Crusader™ “AK” Front

Off Track:	Front (“AK”):	4 - 7 compression; 3 - 5 rebound
Handling:	Front (“AK”):	8 - 10 compression; 12 - 16 rebound
Drag Racing:	Front (“AK”):	10 - 14 compression; 0 - 4 rebound (weight transfer)

Crusader™ “AP” Front

Off Track:	Front (“AP”):	4 - 7 compression; 0 rebound
Handling:	Front (“AP”):	8 - 10 compression; 8 - 12 rebound
Drag Racing:	Front (“AP”):	8 - 10 compression; 13 - 17 rebound (front tie-down)
Drag Racing:	Front (“AP”):	10 - 14 compression; 0 - 4 rebound (weight transfer)

NOTE: The above recommended starting points are suggestions. These settings may or may not work for your application. Certain vehicle/driver/track combinations may have optimal shock settings completely outside of these ranges. That is the beauty of a double adjustable shock absorber... you can set it where it works the best for you and your set-up!

WARRANTY

Viking warrants that the products will be free from defects in material and workmanship for two years from date of sale to the original purchaser. Viking makes no other warranty of any kind, express or implied. Viking shall have no obligation under the foregoing warranty where the defect is the result of improper or abnormal use, your negligence, vehicle accident, improper or incorrect installation or maintenance, nor when the product has been repaired or altered in any way. Viking’s liability in the case of defective products subject to the foregoing warranty shall be limited to the repair or replacement only, at Viking’s option, of the defective products. In no event shall Viking be liable for the cost of procurement of substitute products, or liable for any indirect, special, incidental, consequential or exemplary damages for any reason. Some states do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you.

In order to be eligible for service under this warranty, return the defective part to Viking together with the pre-approved R.G.A. number issued by Viking. Tag each item with the part number and the specific explanation of defect. All returns must be shipped prepaid to: Viking Performance, Inc., RGA # _____, 21401 Hemlock Ave., Lakeville, MN 55044.

Purchaser acknowledges that parts and services sold by Viking are exposed to a wide variety of conditions, and that Viking does not have full knowledge of the intended use of the goods. Purchaser agrees to indemnify and hold Viking harmless upon demand against all claims, actions, loss, damage or injury resulting from the direct or indirect use of the products, or purchaser’s inability to determine the proper use or application of the products. Viking shall not be liable for any claims, demands, injuries, damages, actions, or causes of action whatsoever to buyer arising out of or connected with the use of any Viking products. **MOTORSPORTS ARE DANGEROUS; AS SUCH, NO WARRANTY OR REPRESENTATION IS MADE AS TO THE PRODUCTS’ ABILITY TO PROTECT THE USER FROM INJURY OR DEATH. THE USER FULLY ASSUMES THAT RISK. ALL PRODUCTS ARE INTENDED FOR RACING AND OFF-ROAD USE AND MAY NOT BE LEGALLY USED ON THE HIGHWAY.** We reserve the right to change specifications without notice.