



21401 Hemlock Ave. Lakeville, MN 55044
 Phone: 952-469-4130 www.vi-king.com Fax: 952-469-4132

Congratulations on your purchase of Viking Crusader™ double adjustable shock absorbers! You can rest assured that you are getting the best value for your dollar with Viking high performance shocks.

**INSTALLATION / TUNING GUIDE FOR
 VIKING CRUSADER DOUBLE ADJUSTABLE
 CUSTOM MOUNT (EYE / EYE) SHOCKS
 [Part Numbers D301xx – D3xxxx]**

Each Viking Crusader™ double adjustable custom mount shock includes:

PART NUMBER	QUANTITY	DESCRIPTION
D3xxxx	1	DOUBLE ADJUSTABLE SHOCK - CRUSADER
<i>BEARING MOUNT SHOCKS ONLY:</i> SSBxxT-APK	1	INCLUDES (2) BEARINGS, (4) SNAP RINGS
<i>POLY MOUNT SHOCKS ONLY:</i> 9556-104	2	1/2" SLEEVES
9556-105	2	5/8" SLEEVES

It is important to note that your **shocks should never be used as a travel limiter**. Straps or cables made for travel limitation should be used prevent topping out. Vehicles used in a manner where they could bottom out the shocks (such as drag racing) should use a higher rate spring and a bump stop to help prevent shock damage. Any shock can be damaged from wheel stands despite bump stops. The installation of the shock is recommended at the following ride heights in order to avoid having the shock possibly top or bottom out, which could cause damage to the shock that is not covered by warranty.

SHOCK PART NUMBER	RECOMMENDED RIDE HEIGHT	SHOCK STROKE	RECOMMENDED SPRING LENGTH
D301xx, D301xx-W, D302xx	9 5/8" – 10 3/8"	2.44"	7"
D303xx, D303xx-W, D304xx	10 3/4" – 11 5/8"	3.19"	8"
D305xx, D305xx-W, D306xx	11 5/8" – 12 5/8"	4.20"	9"
D317xx, D317xx-W, D318xx	12 3/8" – 13 3/8"	4.65"	10"
D307xx, D307xx-W, D308xx	13 1/4" – 14 1/4"	5.25"	10"
D309xx, D309xx-W, D310xx	13 7/8" – 15 1/8"	5.75"	12"
D311xx, D311xx-W, D312xx	15 1/8" – 16 1/2"	6.75"	14"
D313xx, D313xx-W, D314xx	15 5/8" – 17 1/8"	7.00"	14"
D319xx, D319xx-W, D320xx	16 5/8" – 18 3/8"	7.75"	14"
D315xx, D315xx-W, D316xx	18 3/8" – 20 1/4"	8.69"	14"

INSTALLATION

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

1. Verify that your shocks are the correct lengths and mount style before beginning installation. Contact your chassis builder, supplier or Viking if you have any questions.
2. Measure your vehicle's ride height by measuring from the center point of the fender lip down to the ground. Mark the spot you measured to for later reference.
3. Reference your vehicle's owner's manual to determine the proper jacking locations, and the instructions for removing the shocks and 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 and remove the wheels. Remove the shocks and retain all mounting hardware.
5. Fully extend the piston rod and ensure that the jam nut under the bearing housing is secure.
6. Insert the proper poly sleeves or bearing mounts into the shock ends. For bearing mount shocks, insert the bearing in a twisting motion. It may be necessary to press the bearings into the shock. If so, do **not** press on the ball; press only on the race surrounding the ball. Install snap rings on both sides of each bearing and ensure they are fully seated in the loops.
7. Install the shock on the vehicle.
8. Reattach the wheels and torque everything to the specifications defined by the vehicle's manufacturer.
9. Verify that there is clearance around the shock and that the suspension does not bind at all, even when wheels are turned to full lock position.
10. Remove the jack stands and carefully place the car on the ground to check clearances again. Lightly bounce the vehicle at each corner to verify that there are not any clearance issues.
11. Measure the ride height as you did prior to installation and ensure that there is sufficient travel in both directions. Ideally, 60% of the shock stroke is available for compression. **INCORRECT RIDE HEIGHT COULD RESULT IN DAMAGE TO THE SHOCK THAT IS NOT COVERED UNDER WARRANTY.**

VIKING CRUSADER™ TUNING AND ADJUSTMENT INSTRUCTIONS

Vehicles used on the street, drag cars, and road racers will all have different needs in terms of shock valving. However, it does not stop there. Driver style / capability, road / track conditions, vehicle type (car vs. pickup, etc.), vehicle weight, horsepower, tires, etc. all create different needs in terms of shock valving. That is the beauty of a double adjustable shock. Your Viking Crusader™ shocks have a total of 19 positions (18 clicks plus a zero position) of compression adjustment and a total of 22 positions (21 clicks plus a zero position) of rebound adjustment, for a total of 418 different valvings. Compression and rebound are independently controlled on the Viking shocks. The “C” knob adjusts compression, while the “R” knob adjusts rebound. Every Viking shock is tested on a dynamometer prior to shipment to ensure that it is functioning properly. Manually moving a shock is not an accurate testing method for ensuring that shocks are functioning properly. Position zero 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 shock.

Recommended baseline points for adjusting your shocks are outlined below. However, you must consider the shock Crusader™ valving purchased, as these shocks are valved for a specific purpose. As such, while the shock setting can be changed, the “CR” valving was not designed for auto-cross or drag competition. Also, keep in mind the following:

Ride Quality:

In general, for excellent ride quality and decent handling, the rebound should be set roughly 4 to 8 clicks higher than the compression on the front and 2 to 6 clicks higher on the rear.

Handling (Auto-Cross/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 have a tendency to 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).

Comfortable Ride / Cruise (“CR” kit) - Crusader™ “CD” Valving

Ride Quality/Street:	Front (“CD”):	1 - 4 compression; 8 - 12 rebound
	Rear (“CD”):	0 - 3 compression; 4 - 8 rebound
Handling:	Front (“CD”):	8 - 12 compression; 18 - 21 rebound
	Rear (“CD”):	7 - 11 compression; 15 - 18 rebound
Drag Racing:	Front (“CD”):	12 - 16 compression; 0 - 4 rebound
	Rear (“CD”):	0 - 4 compression; 10 - 14 rebound

Drag-Lower Horsepower (“DL” kit) – Crusader™ “AD” Front & “AJ” Rear Valving

Ride Quality/Street:	Front (“AD”):	1 - 4 compression; 5 - 9 rebound
	Rear (“AJ”):	0 - 3 compression; 3 - 7 rebound
Handling:	Front (“AD”):	8 - 12 compression; 14 - 18 rebound
	Rear (“AJ”):	7 - 11 compression; 11 - 15 rebound
Drag Racing: (weight transfer)	Front (“AD”):	12 - 16 compression; 0 - 4 rebound
	Rear (“AJ”):	0 - 4 compression; 6 - 10 rebound

Drag-Higher Horsepower (“DH” kit) – Crusader™ “AP” Front & “AM” Rear Valving

Ride Quality/Street:	Front (“AP”):	1 - 4 compression; 3 - 6 rebound
	Rear (“AM”):	0 - 3 compression; 3 - 6 rebound
Handling:	Front (“AP”):	8 - 12 compression; 10 - 14 rebound
	Rear (“AM”):	7 - 11 compression; 12 - 16 rebound
Drag Racing: (front tie-down)	Front (“AP”):	8 - 12 compression; 15 - 19 rebound
	Rear (“AM”):	7 - 11 compression; 8 - 14 rebound
Drag Racing: (weight transfer)	Front (“AP”):	12 - 16 compression; 0 - 4 rebound
	Rear (“AM”):	0 - 4 compression; 6 - 12 rebound

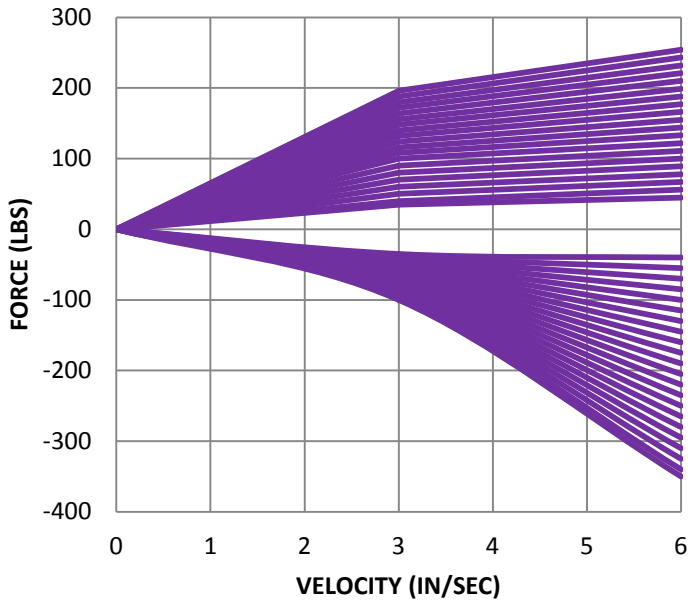
Pro-Touring (“PT” kit) - Crusader™ “AP” Valving

Ride Quality/Street:	Front (“AP”):	1 - 4 compression; 3 - 6 rebound
	Rear (“AP”):	0 - 3 compression; 1 - 4 rebound
Handling:	Front (“AP”):	8 - 12 compression; 10 - 14 rebound
	Rear (“AP”):	7 - 11 compression; 8 - 12 rebound
Drag Racing: (front tie-down)	Front (“AP”):	8 - 12 compression; 15 - 19 rebound
	Rear (“AP”):	7 - 11 compression; 6 - 10 rebound
Drag Racing: (weight transfer)	Front (“AP”):	12 - 16 compression; 0 - 4 rebound
	Rear (“AP”):	0 - 4 compression; 4 - 8 rebound

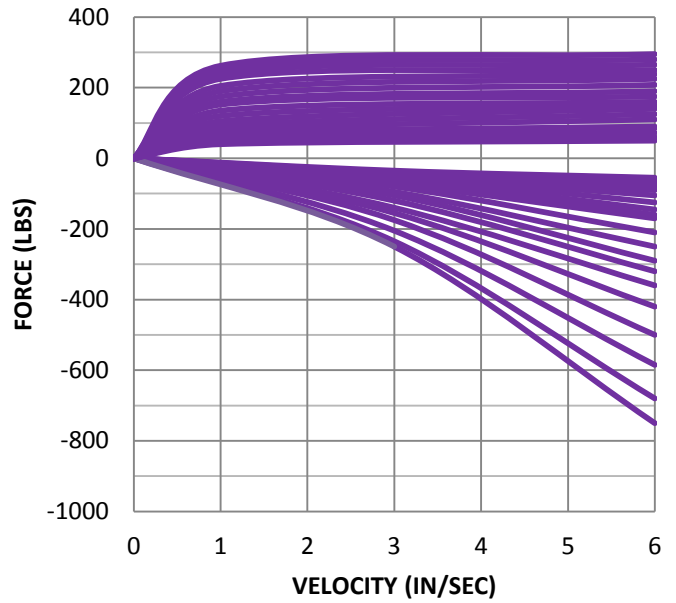
NOTE: The above recommended starting points are suggestions. These settings may or may not work for your application. Certain vehicle/driver/track combinations may have optimal shock settings completely outside of these ranges and may even be at an extreme, such as full max on rebound. That is the beauty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

VIKING CRUSADER™ SAMPLE SHOCK DYNO GRAPHS

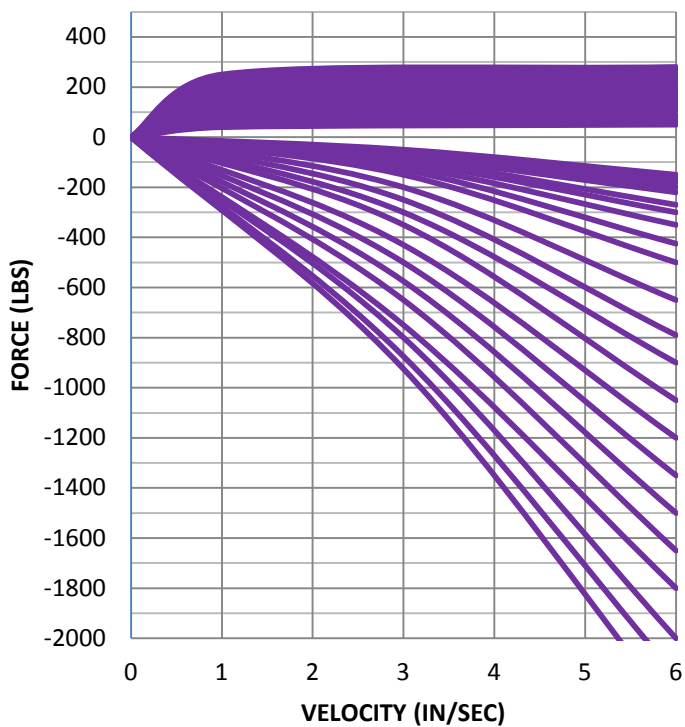
VIKING CRUSADER "CD"



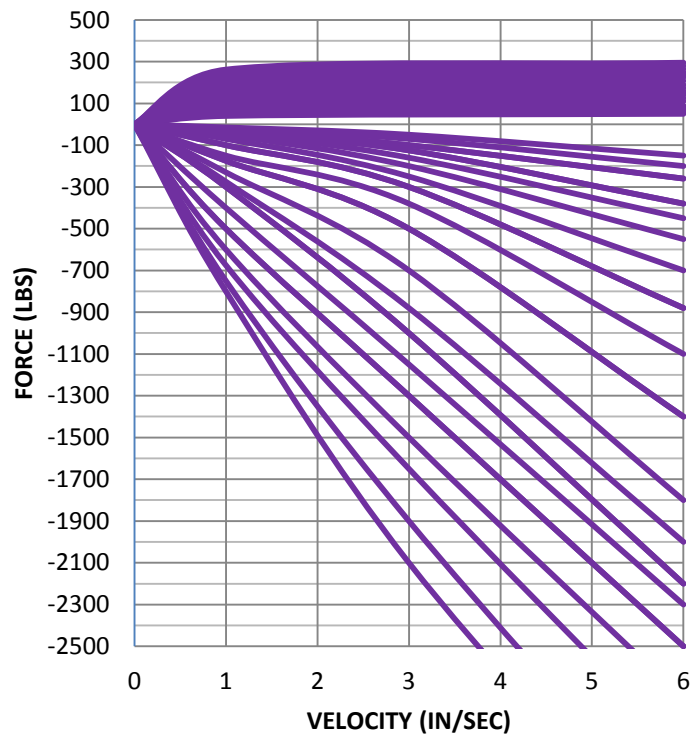
VIKING CRUSADER "AJ"



VIKING CRUSADER "AM"



VIKING CRUSADER "AP"



CRUSADER™ REBOUND REVALVE INSTRUCTIONS

The following instructions are meant to explain how to successfully change the rebound valving on our Crusader™ series shock. This does not pertain to the compression side valving – do not open the compression side. If any of the instructions are unclear or you experience any difficulties please contact Viking Performance technical department.

Tools needed:

- 5/64" Allen Wrench
- 5/8" Socket & Ratcheting Wrench
- Small Syringe
- Vice
- Flat Head Screw Driver
- Torque Wrench
- Tweezers

Before disassembling the shock, be sure that the shock and work station are clean. Any foreign debris that could enter the shock hydraulic system can severely damage the product and/or the vehicle.

Removal:

1. Adjust the rebound knob so it is rotated all the way counterclockwise, at the zero position. The rebound knob is the right knob labeled with the letter "R". Loosen the set screw on the side of the rebound adjustment knob with a 5/64" Allen wrench. The set screw does not have to be completely removed; simply back the set screw out 5 to 6 revolutions to avoid misplacing it. This will allow the knob to be removed. Be careful to not misplace the small ball bearing and spring when removing the knob. Once the knob is removed, the adjuster stud and nut is exposed.



2. Mount the shock in the vise so the rebound stud is facing up. **Make sure the piston rod is all the way extended.** Failure to do this will result in a loss of shock oil.



3. Remove the 5/8" adjuster nut with a socket and ratcheting wrench, and then remove the adjuster stud/needle assembly.

Continue on to the next step if you are replacing both the valve needle and the seat; multiple needles work with the same seat, so removal of the seat as explained in the next steps is not always necessary.

4. Take the small syringe and carefully remove the small amount of oil in the rebound cavity. Do not discard this oil: save it in the syringe, or place it in a small clean container to use later. Removing this small amount of oil will expose the valve seat.



5. Unscrew the valve seat with a flat head screw driver and carefully remove the seat with a tweezers.

Installation:

Make sure that you are installing the correct needle and seat combination. Failure to do this can potentially result in a complete blockage of oil flow, which can cause damage to the shock and/or the vehicle.

1. Drop the seat down into the rebound hole and securely tighten it using the flat blade screw-driver.
2. Fill the rebound valve cavity up with the oil that was previously removed in the removal process.
3. Prepare the new needle valve. Unscrew the adjuster from the old needle and assemble it to the new needle valve. This adjuster has left hand threads. Make sure there is an O-ring installed around the needle valve and that it is not damaged.
4. Place the needle valve in the rebound valve cavity and thread on the adjuster nut.
5. Using a torque wrench, secure the adjuster nut to **XXX** lbs. /in.
6. Reinstall the rebound adjuster knob. Place the small spring in one of the holes on the back side of the knob. Place a small amount of grease on top of the spring and set the ball bearing on top. The grease will temporarily hold the ball in place when installing the knob.
7. Ensure the rebound stud is turned all the way counterclockwise. Try turning the stud with pliers to verify that it is snug.
8. Place the knob on the stud, making sure the ball bearing lines up on top with one of the 6 divots in the adjuster nut*. Firmly place pressure on the knob and tighten the set screw.



*After installation is complete, check to make sure that when you turn the rebound all the way soft (turn counterclockwise), it lands perfectly on a "click" and doesn't fall in between "clicks". If it is in between clicks, then the knob was installed incorrectly. The adjuster stud was either not turned all the way counterclockwise or the ball bearing wasn't aligned with a divot.



OTHER PRODUCTS FROM VIKING

Coil-Over Springs

Made in the U.S.A. Ultra-lightweight, high travel springs provide up to a 25% weight savings over some other springs in the market! Lifetime guaranteed to remain within 2% of the original free height and rate.

Rod End & Spherical Bearings, Adjusters, Clevises, Solid Rod Eyes, Jam Nuts

- Huge selection of styles, materials and sizes
 - o Sizes 3/16" – 1" stocked as standard, larger sizes available upon request
 - o Aluminum and stainless, chromoly and carbon steel bearings stocked as standard
 - o Injection molded loaded slot and two-piece stocked as standard; other styles available special order
- 2 year materials and workmanship warranty

New Products

- Follow Viking on Facebook at: www.facebook.com/vikingperformance to get the most up-to-date product releases first!

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.