

1999 CANNONDALE® SUPER V SL™, SUPER V RAVEN™, SUPER V FREERIDE™, AND SUPER V RAVEN™ FREERIDE™

Owner's Manual Supplement

Congratulations and thanks for purchasing the world's most innovative and best performing full suspension design, the Cannondale Super V. Please take a moment to read this supplement and the other literature included with the bike, including the Cannondale Bicycle Owner's Manual and the HeadShok specific supplement to familiarize yourself with the information they contain. The bike should have also included an owners video. These will provide important safety warnings and performance tips which will make for many miles of high output riding pleasure. If you are missing any of these materials, please see your Cannondale dealer or call 1-800-BIKE-USA.

Because the Super V bicycles are so unique, there are some important facts and warnings of which you need to be aware. The Raven-specific warnings are listed below separately, along with instructions covering proper setup, adjustment, and maintenance. This instruction sheet is meant to supplement, and not replace, the standard Cannondale Bicycle Owner's Manual. The Owner's Manual includes additional information regarding safe use and maintenance of your new bicycle.

WARNINGS FOR ALL CANNONDALE SUPER V MODELS:

WARNING: Inspect the frame carefully for damage after any crash, drop, impact to the frame, or other harsh treatment. Riding a cracked frame could lead to complete bicycle failure. Like other high-performance structures, this frame should be inspected periodically for cracks. DO NOT RIDE a bike with any crack, even a small one. See your authorized Cannondale retailer or call 1-800-BIKE-USA. A crack will weaken the frame and could lead to failure, with risk of serious injury or death to the rider.

WARNING: No frame, this one included, has an infinite fatigue life. It will not last forever and its life depends upon how it is used. Generally speaking, lightweight frames and components have shorter lives. In selecting lightweight frames and components you are making a trade-off, favoring the higher performance that comes with light weight over longevity. As described above, periodically check your bicycle for cracks or signs of structural damage. Do not ride a cracked frame, as continued use could lead to complete bicycle failure and attendant risk of serious injury or death.

WARNING: Do not attempt to modify your frame for any reason! Do not drill any holes in the frame for any reason, and do not weld, braze, or let anyone touch your frame with a torch. Additionally, do not sandblast, sand, acid dip, wire brush, or file your frame. Any of the above procedures may seriously harm the structural integrity and/or longevity of your frame which could lead to a life-endangering accident. Any of the above procedures will also void the warranty.

RAVEN SPECIFIC WARNINGS:

WARNING: Do not ride your Super V Raven if you see any sign of damage, such as broken, splintered, or delaminated carbon fiber. A delamination or break in the adhesive bond between the aluminum backbone and the carbon fiber may be present if the seam has turned white. You should also periodically inspect the aluminum backbone for cracks. If you have any questions, contact your Cannondale retailer, or contact Cannondale directly. Continuing to ride a damaged frame increases the chances of frame failure, with the possibility of injury or death of the rider.

CAUTION: Do not store your Raven in direct sunlight when not in use. The sun's UV rays may cause some degradation over time.

CAUTION: It is possible for some water to accumulate in the frame when the bike is ridden in wet conditions, carried on top of a car in the rain, or washed. This water must be drained out, particularly if freezing temperatures are possible. Keep the drain hole located on underside of downtube (near the bottom bracket) open.

CAUTION: Do not try to sand or polish scratches from the finish of the frame. Sanding through the clear paint coat and the underlying epoxy resin will expose the carbon fiber underneath, resulting in a flat, dull finish. Significant sanding could thin and weaken the frame.

CAUTION: Do not paint your Raven frame. Cannondale cannot foresee all possible paint preparation techniques and painting solvents. To avoid damage we simply recommend against painting the Raven frame. Removing the paint from a Raven frame or repainting the frame will void the frame's warranty.

MAINTAINING THE APPEARANCE OF YOUR SUPER V FRAME

To keep your Super V frame looking its best, we recommend cleaning it regularly with mild soap and water. Regular cleaning will minimize the chances of corrosion. Do not use abrasive cleansers or solvents. The frame has a thin coating of clear paint over the whole frame (including the decals.) A coating of wax can be applied if desired.

PRECAUTIONS/COMPONENT COMPATIBILITY FOR ALL SUPER Vs

FRONT DERAILLEUR

All Super Vs require a standard “bottom-pull” type front derailleur with a 31.8mm clamp diameter. Because the front derailleur mounts to the rear swingarm, and has a limited range of vertical adjustment, some derailleur designs (e.g. Shimano “Top Swing” derailleurs) aren’t compatible.

HEADSET

The Super V frame’s head tube is designed to accept HeadShok forks and HeadShok headset cups only. The frame will accept a fork with a 1 1/8” steerer tube with the use of HeadShok headset adapter cups. Only Head-Shok bearings or adapter cups should be used. For more information, contact a Cannondale Authorized Retailer. *NOTE: All Freeride models come equipped with the HeadShok headset adapter cups.*

CRANKSET/BOTTOM BRACKET

The Super V bottom bracket shell is 68mm wide with English threads. Proper bottom bracket spindle length depends on the crankset being used. Use whatever length spindle recommended by the crank manufacturer, providing the proper clearance between the crankarms and the frame is maintained.

CAUTION: Do not machine (or “face”) either the headtube or the bottom bracket shell. These surfaces are accurately faced at the factory so this traditional frame preparation step is not necessary, and could damage the frame.

CHAINRING SIZE LIMITATIONS

The design of the Super V’s swingarm limits maximum usable chainring size to 50 teeth. Use of any larger chainring may damage the swingarm.

SHIFTING PRECAUTIONS / CHAIN LENGTH

The chain on a Super V must be kept long enough to prevent damage to the rear derailleur when the rear suspension compresses its full travel with the chain on the large chainring and one of the larger rear cogs. When in the small chainring / small rear cog combination, the chain may rub the front derailleur and / or lose tension and may fall off of the drivetrain.

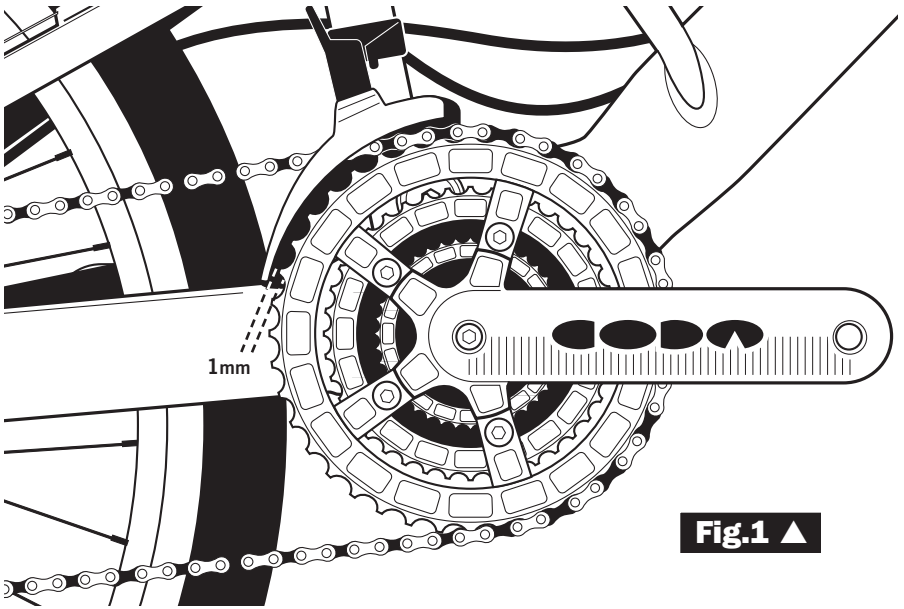
Remember that on any bicycle, the gearing combinations of the smallest front chainring/smallest rear cog, and the largest chainring / largest rear cog should never be used. These gear combinations (called “cross chaining”) place undue stress on the chain, chainrings, and rear cogs. Duplicate or similar gear ratios can be achieved in other combinations using the middle chainring.

SWINGARM PROTECTOR

The swingarm on your Super V is made of thin wall aluminum tubing and some CNC-machined aluminum parts. To protect the swingarm from damage inflicted by the chain slapping against the chainstay, we have supplied a self-adhesive vinyl protector for the swingarm. This protector should be applied to the top of the right (drive side) chainstay, near the chain. Please inspect this protector frequently. If the protector becomes damaged, abraded, or peels off, it should be replaced to prevent damage to the swingarm. To obtain a new swingarm protector, see an Authorized Cannondale Retailer.

ALTERNATIVE BRAKES

Hydraulic brakes are a popular upgrade on many suspension bicycles. When selecting a hydraulic brake system for your Super V, choose one that mounts to the frame using only the existing cantilever brake studs or disc brake caliper mounts. Do not attempt to modify the existing cantilever brake studs or to clamp, weld, or to in any other way add new or different mounts for a hydraulic brake or disc brake. Any attempt to modify the frame, swingarm, fork, or related components will void the warranty and may weaken or damage the frame. For installation instructions and other warnings, refer to the literature provided by the brake's manufacturer. The mount on the Super V's swingarm and fork is designed to fit a CODA Compact Disc Brake caliper. Other brands of disc brakes may fit as well.



FRONT DERAILLEUR ADJUSTMENT

The Super V's rear suspension design places the front derailleur on the rear swingarm. This arrangement requires very precise adjustment of the front derailleur. Adjust front derailleur so that the rear end of the derailleur cage is approximately 1mm above large chainring when there is no weight on the bike. The rear end of the derailleur cage will rock up and away from the chainrings as the suspension is compressed (see Fig. 1.)

CABLE ROUTING

The cables on the Super V must be routed correctly to ensure proper operation of the derailleurs and brakes, and to prevent the cable housing from being pinched when the rear suspension is compressed. Also, be sure to use lengths of cable housing which will not impede steering control and will not contact wheels or tires. Based upon the type of Super V you have purchased, see the appropriate section below for cable installation instructions.

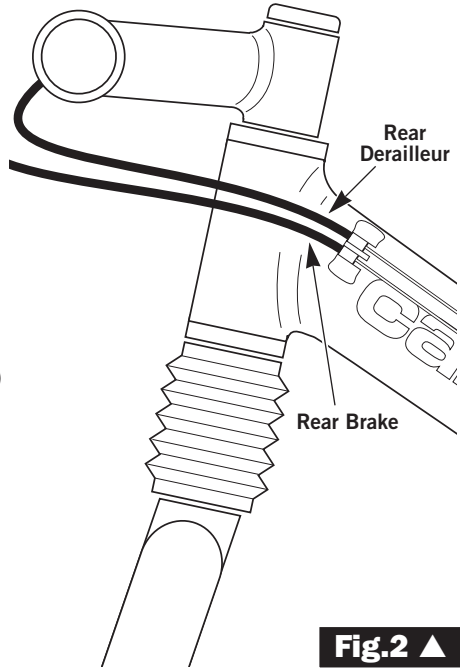
SUPER V SL AND SUPER V FREERIDE CABLE ROUTING

FRONT BRAKE

Run cable housing or hydraulic line directly from the front brake lever to the front brake.

REAR BRAKE

Run cable housing from the rear brake lever to the lower slot in the double housing stop on the left side of the down tube (see Fig. 2.) Run exposed brake cable to the housing stop on the downtube near the rear shock mount. Run cable housing from this housing stop on the downtube to the rear brake. If using hydraulic brakes, run hydraulic line directly from the rear brake lever to the rear brake, securing the line to the frame with the hardware supplied with the brake.



FRONT DERAILLEUR

Run cable housing from the front shifter to the housing stop on the right side of the downtube. Run exposed cable to the housing stop at the lower end of the downtube. Run cable housing (approx. 29cm.) from this downtube stop, through the housing guide under the bottom bracket, to the housing stop on the swingarm just behind the rear suspension pivot. Be sure to leave enough slack in this piece of housing to allow for the movement of the swingarm.

REAR DERAILLEUR

Run cable housing from the rear shifter to the upper slot in the double housing stop on the left side of the downtube (see Fig. 2.) Run exposed cable down to the housing stop on the left side of the downtube near the rear shock absorber mount. Run cable housing from this stop, under the seat area, across to the housing stop on the right side of the swingarm. Run bare cable to the lower housing stop on the right side of the swingarm, and then run housing from this stop to the rear derailleur.

SUPER V RAVEN AND RAVEN FREERIDE CABLE ROUTING

The Raven frame uses long, unbroken pieces of cable housing for the front and rear derailleurs, and for the rear brake.

FRONT BRAKE

Run cable housing or hydraulic line directly from the front brake lever to the front brake.

REAR BRAKE

Run cable housing or hydraulic line from the rear brake lever through the cable housing guides on the left side of the downtube, ending at the rear brake (see Fig. 3.)

FRONT DERAILLEUR

Run cable housing from the front shifter through the cable housing guides on the right side of the downtube. Run the cable and housing under the bottom bracket to the housing stop on the swingarm just behind the rear suspension pivot. Be sure to leave enough slack in this piece of housing to allow for the movement of the swingarm.

REAR DERAILLEUR

Run cable housing from the rear shifter through the cable housing guides on the left side of the downtube (see Fig. 3.) Route the housing across the bike (under the seat area) to the housing stop on the right side of the swingarm. Run bare cable to the lower housing stop on the swingarm. Run cable housing from the rear housing stop on the swingarm to the rear derailleur.

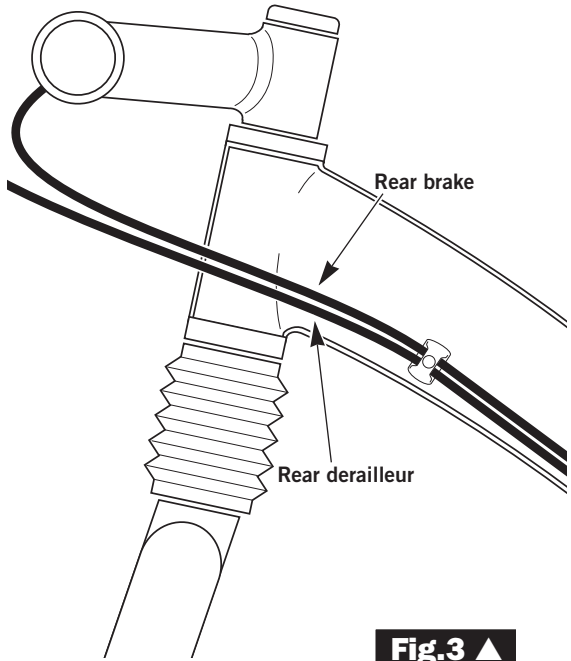


Fig.3 ▲

SUPER V SL AND SUPER V FREERIDE SEATPOST MOUNTING

The Super V SL and Super V Freeride will accept any 27.2mm diameter seatpost. The seatpost must be inserted all the way through and out the bottom end of the seattube. Tighten the seatpost clamp bolt to 70-80 in/lbs. (8-9Nm) (see Fig. 4.)

IMPORTANT: Make sure that the end of the seatpost will not come into contact with the rear shock and/or swingarm as the suspension is compressed. To do so, first adjust the seatpost height for the bike's intended rider. Then compress the rear suspension as far as possible in order to bottom out the suspension travel. If necessary, cut the bottom of the seatpost to provide at least 1/2" of clearance between it and the suspension parts when the suspension is fully compressed. Repeat this check each time the seat height is readjusted.

SUPER V RAVEN AND RAVEN FREERIDE SEATPOST MOUNTING

The Super V Raven will accept any 27.2mm diameter seatpost. It is critical that the seatpost is inserted through both of the frame's seatpost clamps, and is clamped securely. Tighten both of the seatpost clamps to 50 In-Lbs (5.5 Nm) (see Fig. 5.)

IMPORTANT: Make sure that the end of the seatpost will not come into contact with the rear shock and/or swingarm as the suspension is compressed. To do so, first adjust the seatpost height for the bike's intended rider. Then compress the rear suspension as far as possible in order to bottom out the suspension travel. If necessary, cut the bottom of the seatpost to provide at least 1/2" of clearance between it and the suspension parts when the suspension is fully compressed. Repeat this check each time the seat height is readjusted.

Fig.4 ▼

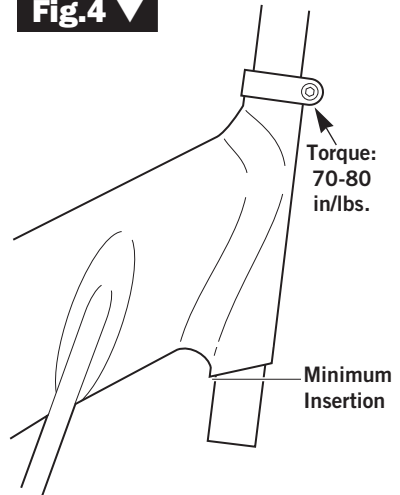
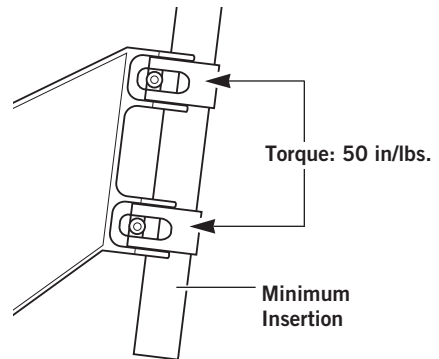


Fig.5 ▼



WARNING: Use only a 27.2mm diameter seatpost and be sure that the seatpost is held in the seatpost clamp(s). The clamp bolt(s) must be properly torqued. Failure to properly torque the clamp(s) could lead to slippage, loss of control and risk of serious injury or death.

REAR SUSPENSION ADJUSTMENT FOR ALL SUPER V MODELS

The Super V SL, Freeride, and Raven models use Fox shock absorbers to provide 120mm of plush rear wheel travel. To get the best performance from the rear suspension, the preload pressure in the rear shock should be adjusted to suit the rider's weight. Based upon which type of shock you have on your Super V, refer to the appropriate section below.

FOX AIR VANILLA AIR/OIL SHOCKS

The Fox Air Vanilla shocks use an air spring to adjust the stiffness of the rear suspension and oil to damp the suspension movement. Before adjusting air spring preload, clean any dirt from the area around the Schrader valve on the shock absorber.

1. With the bike unloaded, attach a high pressure precision air pump with gauge to the threads and add air pressure equal to the rider's weight (in p.s.i.) Then compress the suspension once to charge the negative air spring. This inflation is a good starting point, but can be fine tuned by following the remaining steps.
2. With the rider off of the bike, measure the distance between the centers of the bolts at each end of the shock which anchor the shock to the bike and the swingarm.
3. Have the rider sit on the bike in a normal, relaxed cycling position, with both feet on the pedals and weight on the seat. It may be easiest for the rider to lean against a wall or post. It is important that the rider not bounce the bike.
4. Again measure the distance between the centers of the bolts at each end of the shock. The difference between this measurement and the uncompressed measurement is the suspension "sag."
5. Most riders prefer to set preload so that the bike's rear shock compresses 1/8" to 1/4" when the rider is seated in a normal, relaxed riding position. Add or release air pressure to the suspension, compress the shock once, and recheck your measurements to achieve desired sag setting.

NOTE: Rear suspension preload is a matter of personal preference. We encourage riders to experiment with different preload settings and find the setting that suits them best. If too much preload is set, the suspension will be stiff and unresponsive over small bumps. Alternately, if the preload is too soft, the rider may feel some amount of “bouncing” while climbing or sprinting, and may tend to bottom out the shock (compress to the limit of its travel) on large bumps.

FOX VANILLA COIL/OIL SHOCKS

The Fox Vanilla shocks use a coil spring to adjust the stiffness of the rear suspension and oil to damp the suspension movement. Note that the spring rate (stiffness) of the coil spring is printed on the outside of the coil, and that coils of different spring rates are available.

1. With rider off bike, measure distance between centers of the bolts at each end of the shock which anchor the shock to the bike and swingarm.
2. Have rider sit on bike in a normal, relaxed cycling position, with both feet on pedals and weight on seat. It may be easiest for the rider to lean against a wall or post. It is important that the rider not bounce the bike.
3. Again measure the distance between the centers of the bolts at each end of the shock. The difference between this measurement and the uncompressed measurement is the suspension “sag.”
4. Most riders prefer to set the preload so that the bike’s rear shock compresses 1/8” to 1/4” when the rider is seated in a normal, relaxed riding position. With the rider off of the bike, turn the adjusting ring clockwise to compress the coil (decreasing the amount of sag,) or counter-clockwise to increase the amount of sag compression. Recheck your measurements to achieve your desired sag setting. If more than 4-5 turns of preload are required to achieve the correct amount of sag, it is recommended that the coil be replaced with the next heavier spring rate. If the suspension is too stiff with the adjusting ring applying no pressure to the spring, it is recommended that the coil be replaced with the next lighter spring rate.

NOTE: Rear suspension preload is a matter of personal preference. We encourage riders to experiment with different preload settings and find the setting that suits them best. If too much preload is set, the suspension will be stiff and unresponsive over small bumps. Alternately, if the preload is too soft, the rider may feel some amount of “bouncing” while climbing or sprinting, and may tend to bottom out the shock (compress to the limit of its travel) on large bumps.

REBOUND DAMPING ADJUSTER KNOB

Rebound damping controls the speed at which the suspension returns to its extended position after being compressed by a bump. The rebound damping on some Fox rear shocks can be tuned by turning the red adjuster knob, located on the shock body. To set the rebound damping to a heavier position (for slower suspension return), turn the adjuster knob clockwise. Conversely, to set the damping lighter (for quicker suspension return), turn the knob counter-clockwise.

Rebound should be as fast as possible without kicking back and pushing the rider off the saddle when riding the bike in rough terrain. If the rebound is too slow the suspension will not allow the wheel to follow the changing terrain. Determining the proper rebound setting may take a number of rides. During the first few rides adjust the damping and note the different ride characteristics. You may want to change your rebound setting for different riding conditions.

COMPRESSION DAMPING ADJUSTER

Some Fox rear shocks equipped on Freeride bicycles also have a compression adjuster which changes the rate at which the shock compresses through the shock stroke. Determining the proper compression setting is a matter of personal preference. During the first few rides adjust the knob or lever to vary the compression characteristics. Note that different trail conditions may favor different compression settings.

CANNONDALE WARRANTY

Your Cannondale Super V SL, Super V Freeride, Super V Raven, or Super V Raven Freeride frame is warrantied against manufacturing defects in materials and/or workmanship for a period of five years from the date of purchase. During the covered period, we will repair any defective frame, or at our discretion, we will replace a defective frame with the same or comparable model (due to product evolution.)

All other components, including HeadShok forks, suspension parts, frame fixtures and finishes (paint and decals) are warrantied against manufacturing defects in materials and/or workmanship for a period of one year from the date of purchase.

For complete information regarding your Cannondale Limited Warranty, please refer to your Cannondale Bicycle Owner's Manual.

PLEASE NOTE...

This booklet is meant to supplement, not to replace, the Cannondale Bicycle Owner's Manual. The owner's manual contains valuable information regarding safe operation, adjustment, and maintenance of your bicycle, as well as more complete warranty information. Please read the Cannondale Bicycle Owner's Manual thoroughly before riding your bicycle, and keep it and this booklet for future reference.

For warranty related questions or for more information on this or any Cannondale product, please feel free to contact us.

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Japan: (81) 722-99-9399

Australia: (612) 9979-5851

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