

SAFETY INFORMATION

ABOUT THIS SUPPLEMENT

Cannondale Owner's Manual Supplements provide important model specific safety, maintenance, and technical information. They are not replacements for your *Cannondale Bicycle Owner's Manual*.

This supplement may be one of several for your bike. Be sure to obtain and read all of them.

If you need a manual or supplement, or have a question about your bike, please contact your Cannondale Dealer immediately, or call us at one of the telephone numbers listed on the back cover of this manual.

You can download Adobe Acrobat PDF versions of any Cannondale Owner's Manuals or Supplements from our website: <http://www.cannondale.com/bikes/tech>.

- This manual is not a comprehensive safety or service manual for your bike.
- This manual does not include assembly instructions for your bike.
- All Cannondale bikes must be completely assembled and inspected for proper operation by a Cannondale Dealer before delivery to the owner.

WARNING

This supplement may include procedures beyond the scope of general mechanical aptitude.

Special tools, skills, and knowledge may be required. Improper mechanical work increases the risk of an accident. Any bicycle accident has risk of serious injury, paralysis or death. To minimize risk we strongly recommend that owners always have mechanical work done by an authorized Cannondale retailer.

HEADSHOK SOLO w/DL50 BICYCLE FORK SUPPLEMENT

Please consult the Cannondale *Solo Bicycle Fork Owner's Manual Supplement* for care and maintenance information concerning the fork and front wheel removal and installation.

REAR BRAKE ROTOR

WARNING

KEEP YOUR HANDS AND FINGERS CLEAR OF THE BRAKE ROTOR AND CHAINCASE!!

CHAINCASE HUB CAP

NOTICE

DO NOT RIDE THIS BIKE WITH THE CHAINCASE HUB CAP REMOVED. Serious damage to the hub will result. See page 13.

BICYCLE REPAIR / WORK STANDS

The clamping jaws of a bike stand can generate a crushing force strong enough to seriously damage your frame.

NOTICE

Never place your bike in a bike stand by clamping the frame.

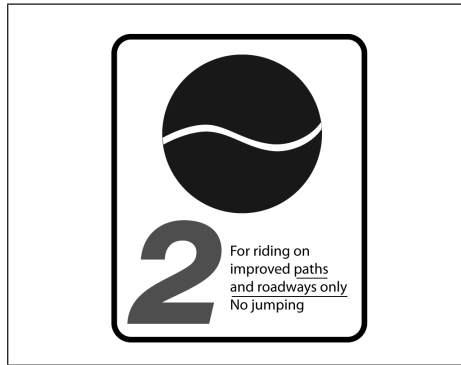
Place your bike in a stand by extending the seat post and positioning the stand clamp on the extended seat post. Don't extend beyond the MINIMUM INSERT line marked on the seat post.

Since a seat post can also be damaged by clamping force, adjust the stand clamp for the minimum clamping force needed to secure the bike.

Also, before clamping, clean the post and protect the seat post finish with a rag.

INTENDED USE

General Purpose Riding



CONDITION 2

Bikes designed for riding Condition 1, plus smooth gravel roads and improved trails with moderate grades where the tires do not lose ground contact.

INTENDED

For paved roads, gravel or dirt roads that are in good condition, and bike paths.

NOT INTENDED

For off-road or mountain bike use, or for any kind of jumping. Some of these bikes have suspension features, but these features are designed to add comfort, not off-road capability. Some come with relatively wide tires that are well suited to gravel or dirt paths. Some come with relatively narrow tires that are best suited to faster riding on pavement. If you ride on gravel or dirt paths, carry heavier loads or want more tire durability talk to your dealer about wider tires.

MAXIMUM WEIGHT LIMIT

RIDER lbs / kg	LUGGAGE lbs / kg	TOTAL lbs / kg
300 / 136	30 / 14	330 / 150

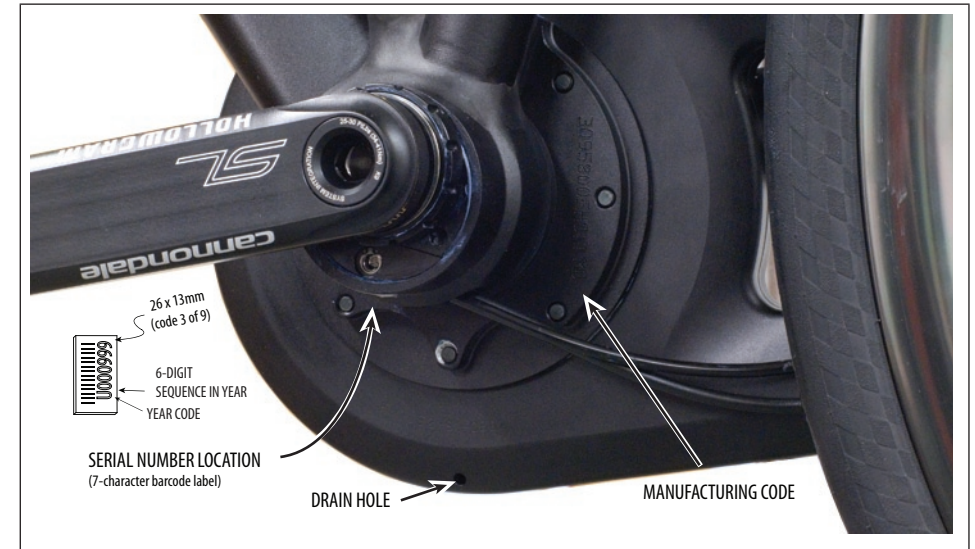
WARNING

**UNDERSTAND YOUR BIKE AND ITS INTENDED USE.
USING YOUR BIKE THE WRONG WAY IS DANGEROUS.**

Industry usage Conditions 1 - 5 are generalized and evolving. Consult your Cannondale Dealer about how you intend to use your bike.

Please read your *Cannondale Bicycle Owner's Manual* for more information about Intended Use and Conditions 1-5.

IDENTIFICATION



Serial Number

The serial number for this bicycle is printed on a barcoded label on the underside of the bottom bracket. Use this serial number for warranty registration and theft recovery. See your *Cannondale Bicycle Owner's Manual* for more information on warranty registration.

Manufacturing Code

There is also a Cannondale manufacturing stamped on the bottom bracket node. This stamped number consists of several numbers such as factory shop order, frame code, and frame size code.

ON

The ON bike is the first production bike inspired by the ON Concept bike shown at Eurobike 2007. The ON makes use of the “System Integrated Chain Case Technology”, where the chain case is a single sided, fully enclosed, structural part of the bike frame. This result in a clean and efficient drive system with 9 speed internal gears and disc brakes. The unique chain case structure is machined from billet, making the structure extremely stiff yet light at the same time. Cables are internally routed in the frame and the tube shapes are edgy and aggressive. The fork is the Cannondale specific HeadShok Solo w/DL50 which makes this bike truly single sided. The bike is the first of its kind, very unique and innovative.

CANNONDALE URBAN TECHNOLOGY

- Handmade frame from 6061-T6 aluminum
- Double-pass smooth welds eliminate stress risers
- Internal cable routing
- SiCC - System Integration Chain Case – CNC machined structural chain case.
- Custom Single Sided SRAM i-motion 9 hub
- Hollowgram SL Cranks – lightest and stiffest production crank set in the world.
- HeadShok Solo w/DL50, coil suspended, oil damped w/ lockout

FRAME TECHNOLOGY FEATURES

- **SiCC - System Integration Chain Case** - single sided structural chain case CNC machined in the USA from 27kg Billet 6061-T6
- **Down tube** - Tapered, hydroformed, edgy evolution of the original PowerPyramid design. Oversized and triple-butted for optimal stiffness to weight ratio.
- **Top tube** - Tapered, hydro formed edgy triangular section at the front for maximum lateral support of the head tube. The triangular shapes of the top tube and down tube combined with the oversized head tube maximize overall torsional stiffness.
- **Seat tube** - Integrated seat post clamp. Butted for lightweight performance.
- **Head tube** - SI externally machined to remove material in the middle section for minimum weight. Integrated headset for elegant transition to fork.
- **Fork** - The unique HeadShok Solo w/DL50 uses a coil spring system for maintenance-free pot hole eating performance. The easy access lockout lever allows on-the-fly changes so you are always in control no matter what the terrain is. The single sided Solo with its bolt on wheel, allows wheel-on flat fixes and offers theft deterrence when making a quick stop.

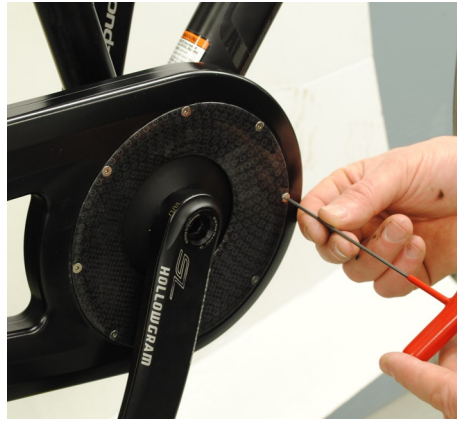


CRANKARMS

The following procedures should only be performed by a professional bike mechanic.

Removal

1. Chain tension must be slackened in order to remove the right crank arm as it is connected to the chain ring. See **CHAIN TENSION**.
2. Remove the chain ring cover screws and remove the chain cover by sliding it over the crank arm.



TIP: Note orientation of crank cover when removing - the hole in cover is not central and the cover should be rotated on assembly so the hole position matches the position of the crank when the eccentric is tightened.

3. Insert a 10 mm Allen key fully into the crank arm fixing bolt.
4. Hold crank arm with your hand and turn the Allen key counter-clockwise to loosen and remove the fixing bolt from the crank arm.



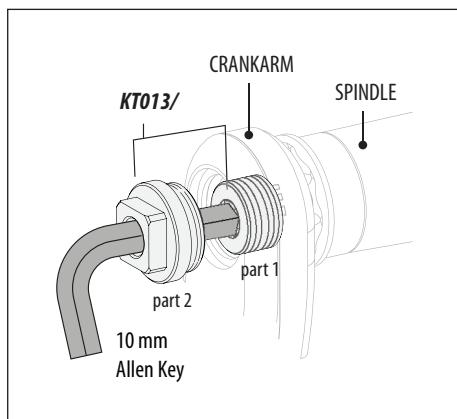
Make sure you remove the thin steel washer under the bolt head. It is black in color; check the bolt or use a pencil tip to remove it from the crank arm seat.

5. Apply some bicycle bearing grease to the Cannondale tool **KT013/**.

Thread tool part 1 into spindle until the top of the stud is flush with the top of the spindle.

Install the tool body part 2 into the crank arm completely and tighten it snug with a 15mm open end wrench.

The left side crank arm is removed in the same way.

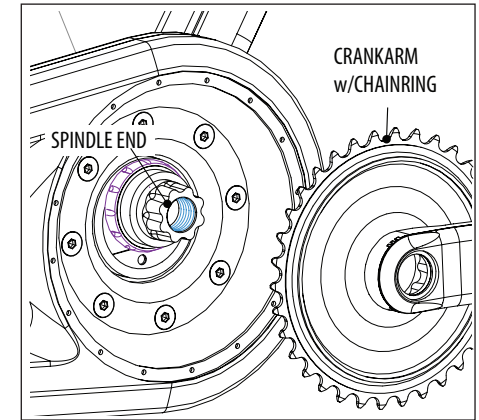


Insert a 10 mm Allen key through the tool part 2 and into part 1. Hold the crank arm and turn the Allen key counter-clockwise until the crank arm can be removed from the spindle end.



The right side crank arm is connected to the chain ring. Both the chain ring and right crank arm will be disconnected from the spindle end. Be sure to note the exploded view for the bearing shield, spacers located on the spindle end.

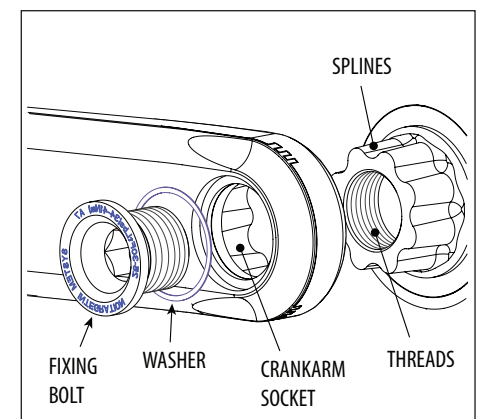
The left side crank arm is removed in the same way. You should also note the spacers, bearing shield, and wave washer.



Crank arm Installation

Install and tighten the right crank arm/chain ring first, then assemble and install the left crank arm. Consult the illustration on the following page for part order.

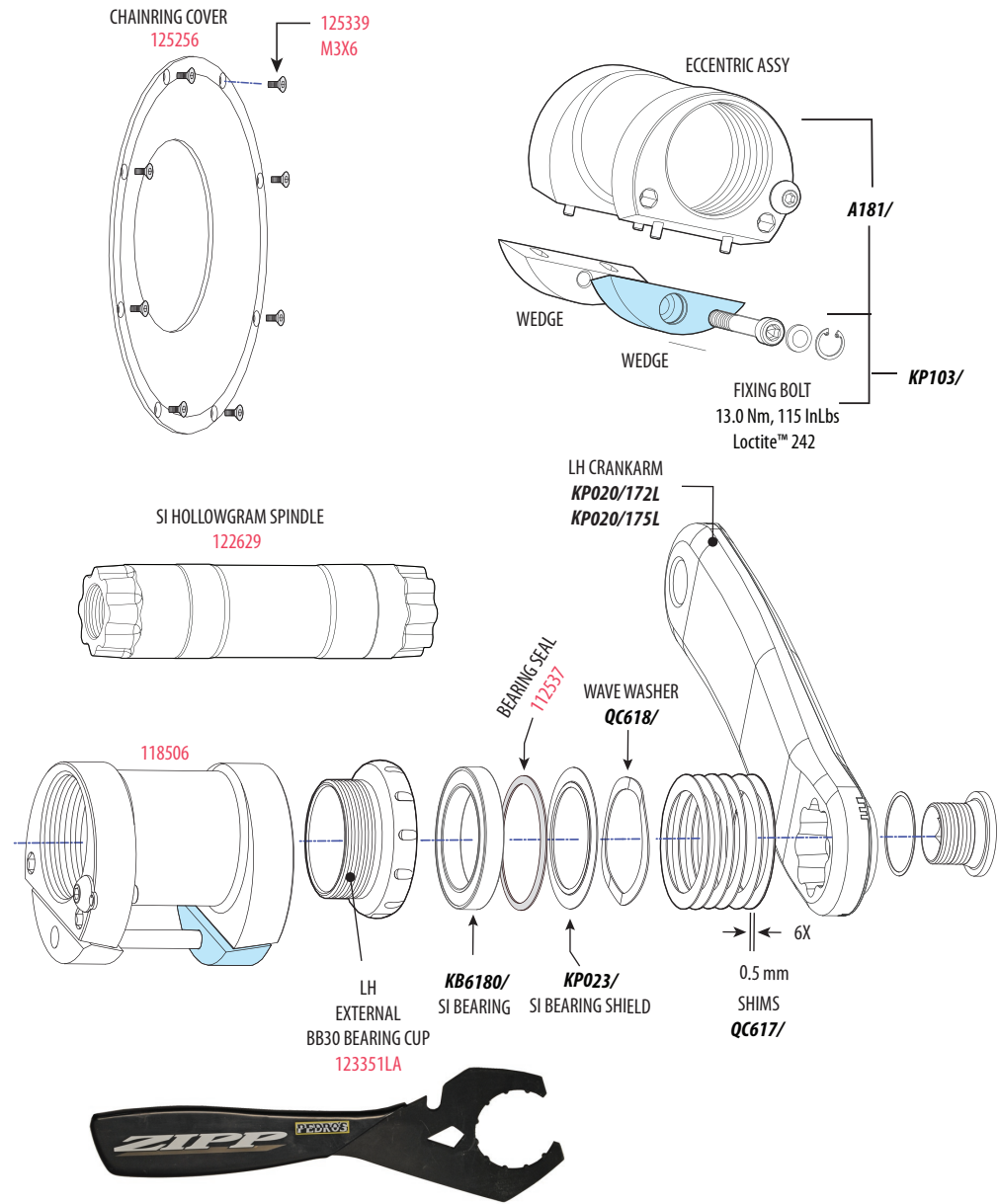
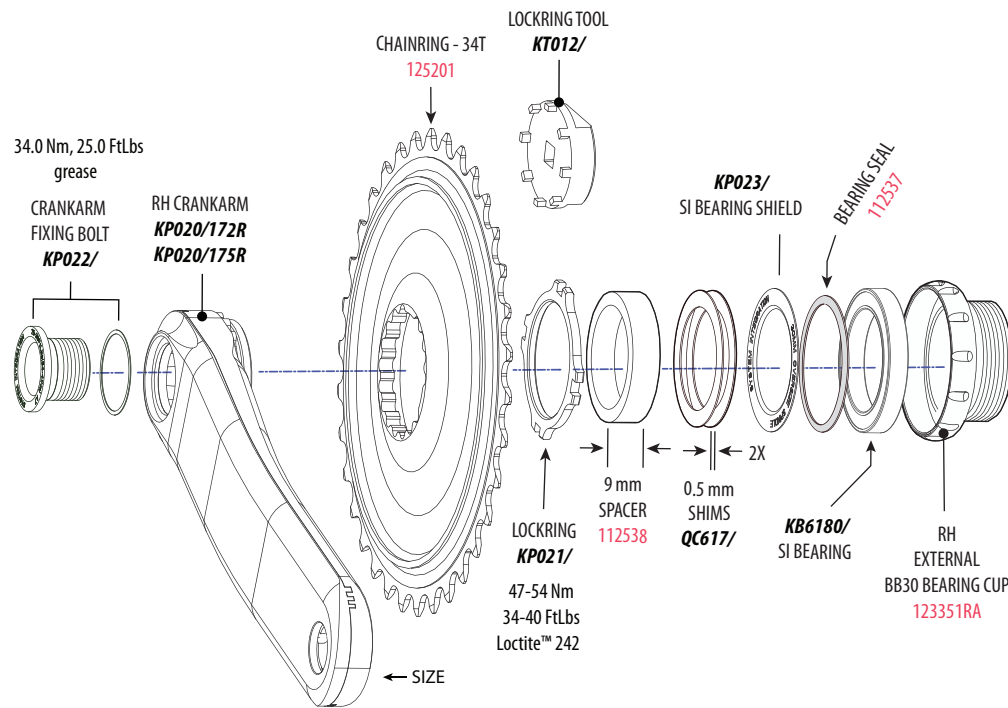
1. Clean the spindle ends, spindle threads, crank arm sockets and apply a high-quality bicycle bearing grease to all. Align the splines and install the crank arm onto the spindle end.
2. Apply grease to the bolt threads and thin steel washer. Install the thin steel washer and fixing bolt into the crank arm and carefully thread into the spindle. Tighten to 34 Nm, 25.0 FtLbs.



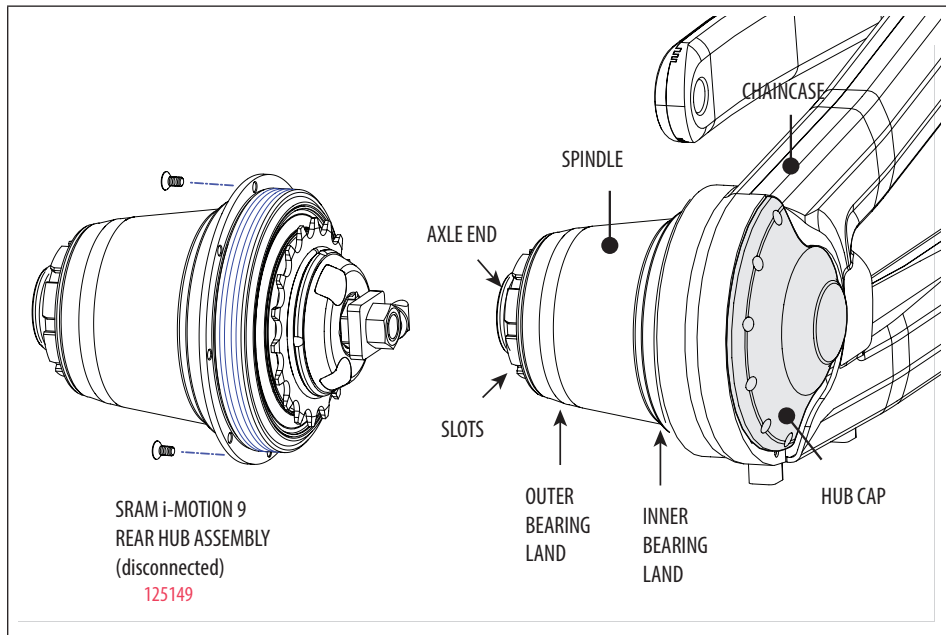
ECCENTRIC BOTTOM BRACKET & CRANKARM PARTS

Eccentric Installation

1. Route rear brake and shifting cable through the bottom bracket. See INTERNAL CABLE ROUTING diagram.
2. Install the drive side bearing cup into the eccentric. Tighten with ZIPP VUMA BB tool.
3. Apply a high-quality bicycle bearing grease to the inside surfaces of the bottom bracket shell and the eccentric wedges.
4. Insert the eccentric into the BB shell on the drive side. Hold the cable in the BB trough as the eccentric is inserted.
5. Install the left side bearing cup and bearing into the left side of the eccentric.
6. Apply a high-quality bicycle bearing grease to the spindle and insert it into the bearings. Center it.
7. Install the parts shown below onto the ends of the spindle.



i-MOTION 9 AND SPINDLE



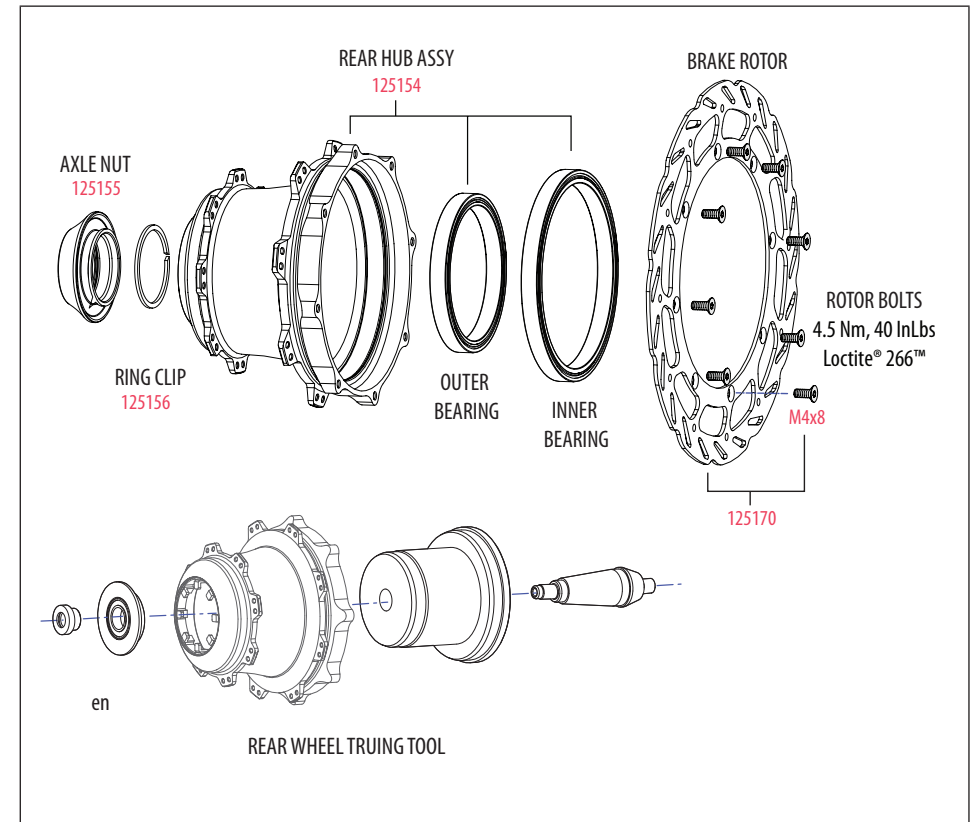
The SRAM i-MOTION 9 rear hub is housed inside a spindle which connects to the ON SiCC chaincase.

This assembly must not be removed from the chaincase. It is connected with a special manufacturing tool.

If this unit requires service, please contact Cannondale for information on how to handle the request.

Shifting set-up of the i-MOTION 9 rear hub is described on page 12.

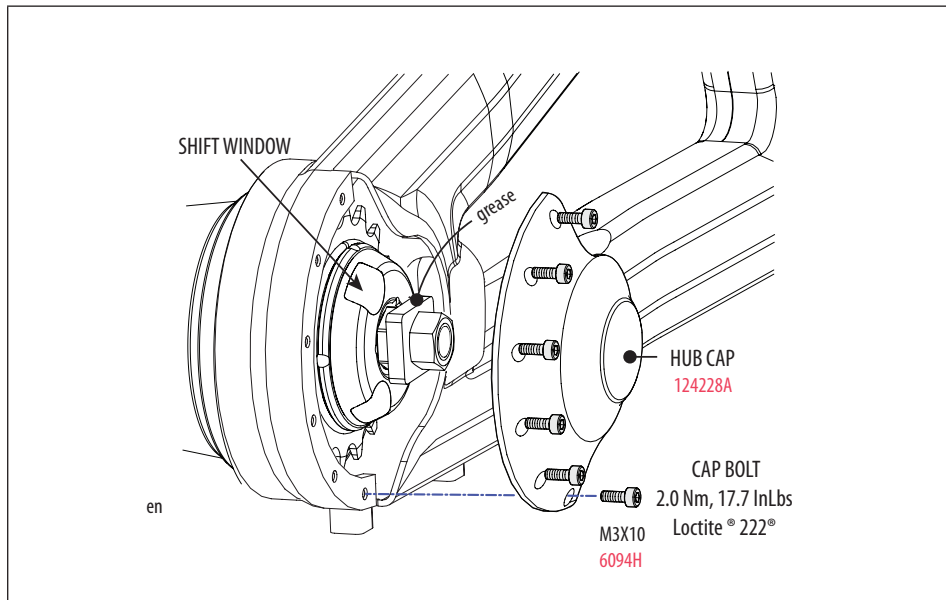
REAR WHEEL HUB & WHEEL TRUING



A wheel truing tool is available to Cannondale Dealers so that the wheel may be positioned in a traditional wheel stand.

It is necessary to remove the axle hub bolt from the end of the hub shell to insert the tool parts.

i-MOTION 9 SHIFT ADJUSTMENT



Shifting adjustment should only be performed only by a professional bike mechanic.

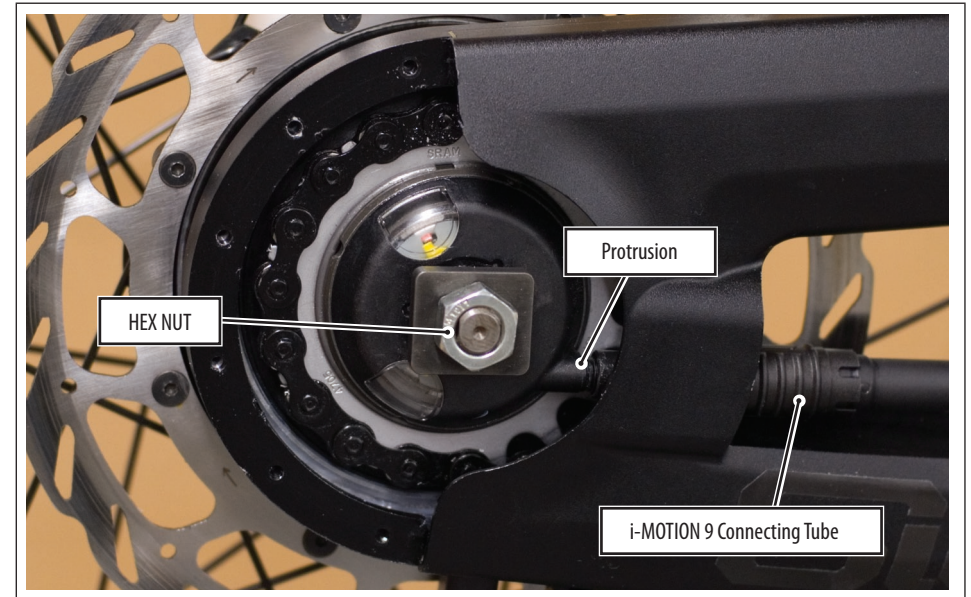
Consult the SRAM iMOTION9 user manual for shifting set-up instructions. A printed copy was included with your bike. You can also download it from the SRAM website at http://www.sram.com/media/techdocs/iMOTION_9_Ins_E_5_06.pdf. To access the hub window described in the SRAM instructions, the rear hub cap will have to be removed.

Before the hub cap is removed:

1. Place the bike in a work stand with the rear wheel suspended.
2. If you haven't already noticed the big NOTICE on the next page, please read it now.

Removing the hub cap:

The cap fits quite tightly. Carefully remove all of the bolts, then and pull the cap straight off. You will have to work slowly. Do not pry it.



NOTICE

- **DO NOT RIDE THE BIKE WITH THE HUB CAP REMOVED.**
- **DO NOT APPLY A LOAD TO THE WHEEL WHILE TURNING THE CRANK ARMS DURING SHIFT SET-UP.** Allow the wheel to rotate freely when adjusting the shifting. If you hold or stop the turning wheel, the hub assembly will spin inside the chaincase housing and may cause the plastic shift cable protrusion to strike the housing forcefully. If this happens it will break it. Damage caused by improper servicing is not covered by your warranty.
- **DO TAMPER WITH THE HEX NUT.**

Before the re-installing hub cap:

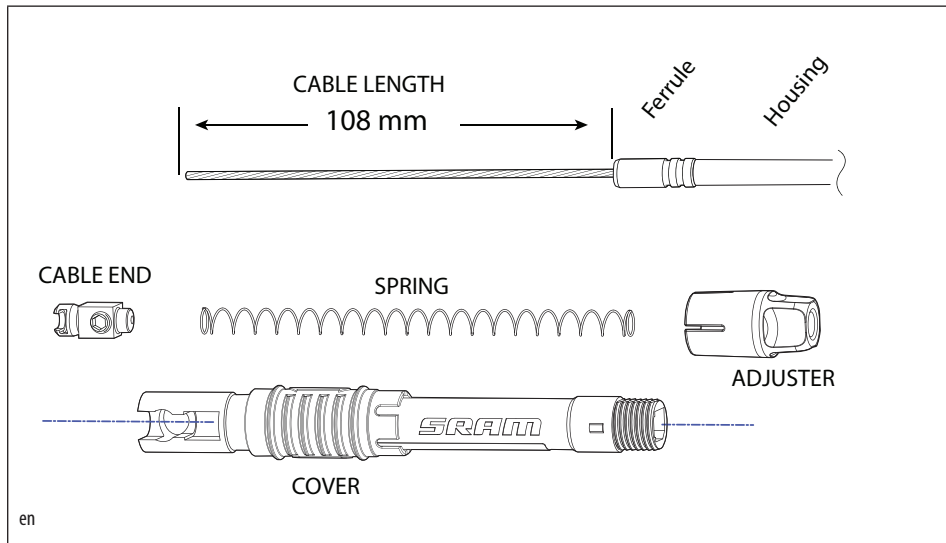
Clean and apply a high-quality bicycle bearing grease to the square hub end recess in the hub cap and the mating surfaces of the chaincase. Be care when apply grease, avoid contaminating chaincase bolt holes. Only a thin film is necessary on the mating surfaces to minimize creaking.

Align the square recess with the hub and position the cap onto the chaincase.

Re-apply Loctite 222 to the bolt threads and tighten them evenly to 2.0 Nm.



i-MOTION 9 CONNECTING TUBE



This is an exploded view of the parts of the i-MOTION 9 connecting tube.

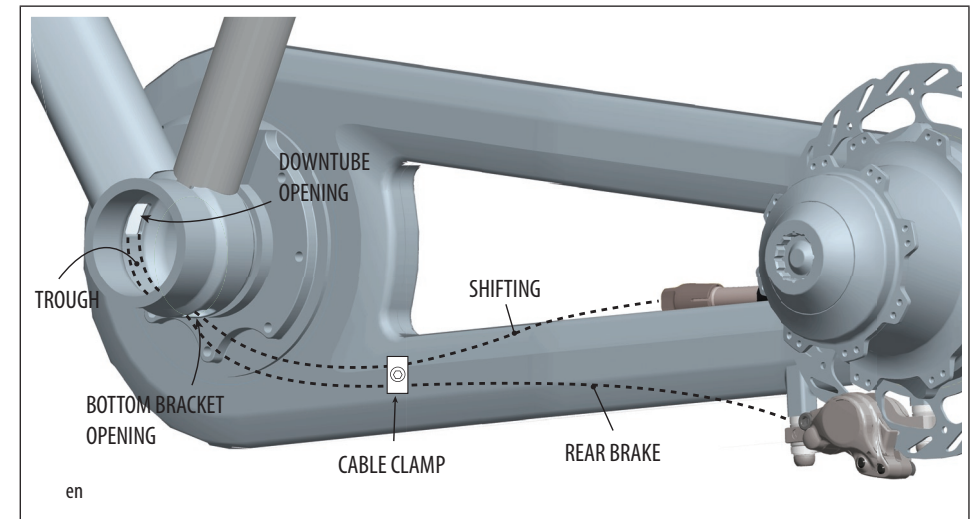
It must be removed and disassembled from the shifter housing before routing the cable through the frame. That's probably obvious to you. But since that involved disassembling it, we're showing it here.

You also need to know about the correct length of cable at the end. Its 108 mm, as you can see above.

When it comes to time to reassemble and reconnect this mechanism, be sure to thread the adjuster on all the way to allow enough slack to make the connection to the hub. The best way to reconnect the cable end with its hub counterpart is to connect the tube to the hub then and use a small pick to align the connector with the hub cable end.



CABLE ROUTING



In order to install the rear shifting and brake line, the eccentric assembly must be removed from the bottom bracket shell. The shift cable is to be fully housed throughout.

The brake hose end fitting and shift cable end (i-MOTION 9 Connecting tube) must be removed to insert through frame.

The rear brake hose and rear shifting cable enter the downtube at the top through the integrated guides.

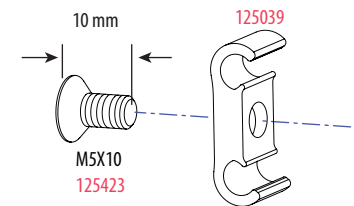
The hose and cable pass around the installed bottom bracket eccentric by way of the small trough in the bottom bracket. The lines should not pass between the body of the eccentric and the wedges as this would interfere with rotation of the eccentric.

Both lines are secured to the chaincase by the cable clamp.

Where the cables contact the outside surface of the frame, be sure to affix the clear adhesive frame protection so rubbing does not occur.

NOTICE

- Apply Loctite 222 and use a torque wrench. Tighten to **2.0 Nm, 17.7 In Lbs.**
- Use correct length crew to prevent chain interference.



CABLE CLAMP
KP126/

en

REAR WHEEL

The following procedures should only be performed by a professional bike mechanic.

Loctite® 641™ Retaining Compound is used to bond the hub bearings to the spindle during wheel installation. Careful cleaning and re-application of the adhesive is necessary anytime the rear wheel is removed and reinstalled.

For Loctite® 641™ Retaining Compound instructions : <http://65.213.72.112/tds5/docs/641-EN.pdf>

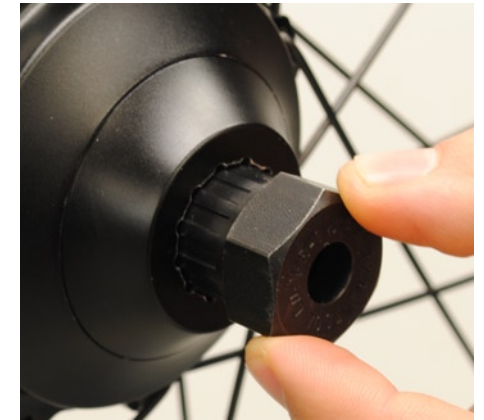
Removal

1. Secure bike in a work stand by the seat post.
2. Support the brake hose to prevent the caliper from hanging. A zip tie or masking tape works well.



3. Disconnect and remove the rear brake caliper mounting bolts. Be sure to note the arrangement of spherical washers/spacers so you return them correctly when re-mounting the caliper.

3. Engage a freewheel remove/installation tool **PARK FR-1** or **Shimano TL-FW30** into the hub axle nut.



4. Hold the rim at the wheel as shown to prevent rotation.

WARNING

KEEP YOUR HANDS AND FINGERS CLEAR OF THE BRAKE ROTOR AND CHAINCASE!!

Hold the wheel as shown at right.



Place a torque wrench with a 1" socket onto the inserted freewheel tool and turn the hub axle nut counter-clockwise.

5. Continue turning the hub nut counter-clockwise until the wheel is fully disengaged from the spindle and it can be withdrawn.

NOTICE

- Support disconnected brake caliper and hose to prevent damage.
- While the wheel is removed, cover both the spindle and the hub opening to protect from contamination or damage.
- Do not tamper with center screw. See arrow at right.

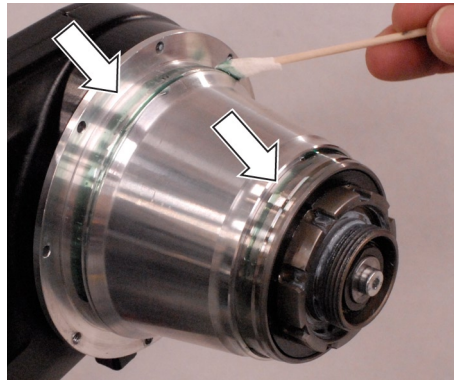


Installation

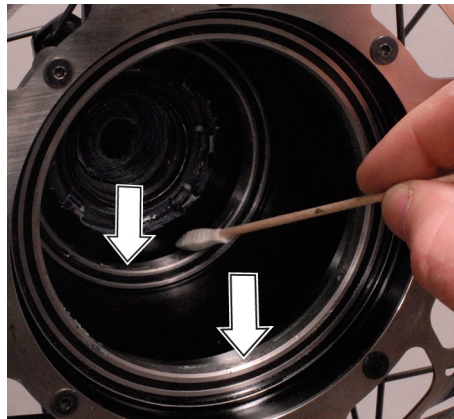
1. Remove any residual Loctite on the inner and outer bearing lands. Use a soft wire brush and the specified solvent. Consult the Loctite instructions.
Apply a film of Loctite® 641™ over the surface of both the inner and outer bearing lands of the spindle.

NOTICE

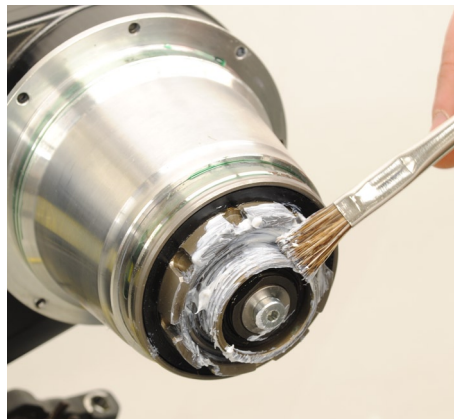
1. Clean Loctite residue from the spindle carefully. Do not to scrape or damage the spindle surface!



2. Apply the Loctite in the same way to the inner race of each bearing inside the hub.



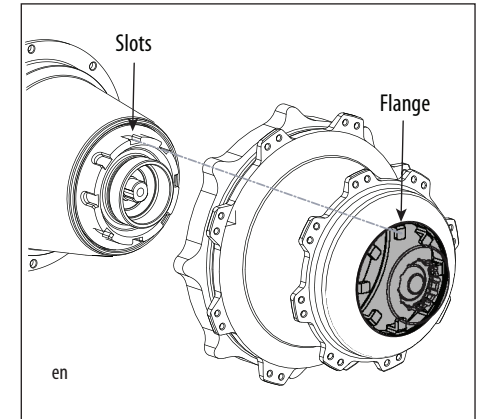
3. Clean and apply a high-quality bicycle bearing grease to the spindle threads and the slots.



4. Align the hub flanges and the spindle slots and install the hub onto the spindle until the axle nut can be threaded onto the spindle end. You may have to hold the axle nut, while slowly rotating the crank arm to move the spindle slots to align them.

Turn the nut by hand to ensure that the nut and spindle threads engage properly.

Before torquing the axle nut, thread the nut using the freewheel tool alone until the brake caliper can be fitted over the rotor onto the chaincase. If the caliper can not be fitted properly, the hub and spindle are not engaged correctly.



5. After you have confirmed that the brake caliper can be installed, use a torque wrench, a 1" socket, and the freewheel tool to tighten the hub bolt to **40 Nm, 354 In Lbs.**

WARNING

KEEP YOUR HANDS AND FINGERS CLEAR OF THE BRAKE ROTOR AND CHAINCASE!!

Hold the wheel as shown at right.



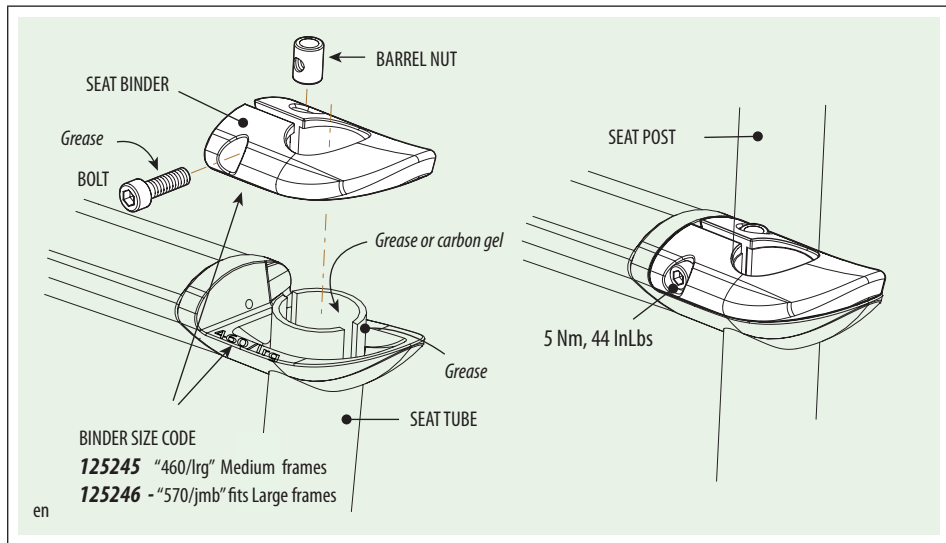
6. Reinstall the rear brake caliper. Test the brakes for proper operation before riding.

NOTICE

- Only torque hub axle bolt when hub and spindle are engaged completely as indicated by correct caliper fitting.
- The Loctite must cure before riding. See Loctite instructions.



SEAT BINDER



Seat Binder Sizing

Large and Medium size frames each require a specifically sized seat binder. The BINDER SIDE CODE is stamped into frame binder node in the position indicated. Cannondale seat binder replacement part numbers appear in the graphic above.

Seat Binder Maintenance

Periodically, to keep the seat binder in good working order, remove the seat post and remove the seat binder from the frame. This will enable you to clean the seat binder, the binder bolt, and barrel nut as well as the frame mating surface.

Apply a light film of bicycle bearing grease to the bolt threads and mating surfaces of the binder node before re-installing the seat binder onto the frame.

Seat Post Installation

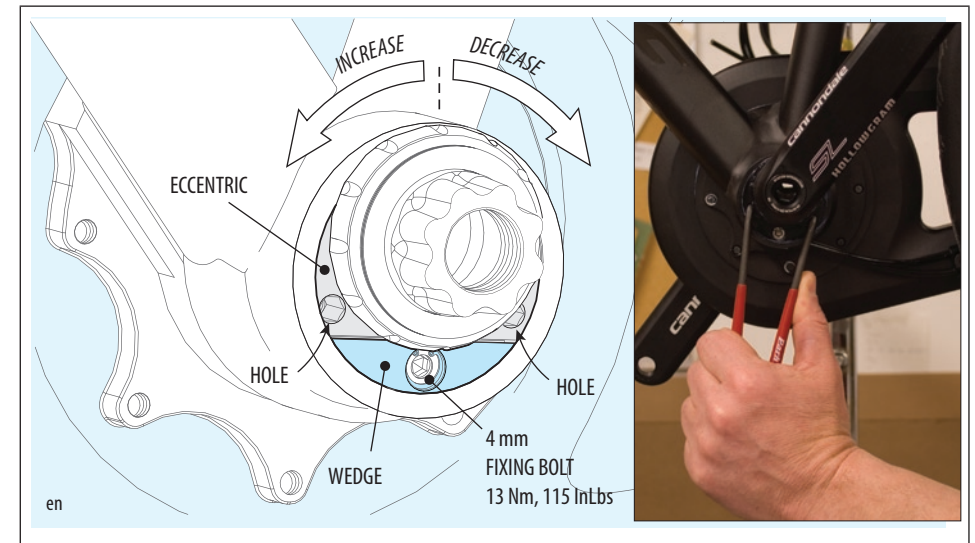
Consult the seat post manufacturer's installation and maintenance instructions for your specific seat post.

Always use a torque wrench when tightening the binder bolt.

We recommend using carbon gel inside the seat tube for both alloy and carbon fiber (composite) seat posts. Carbon gel is available as Cannondale kit **KF115/**.

See your *Cannondale Bicycle Owner's Manual* for additional information on seat posts.

CHAIN TENSION



Chain tension adjustment should be performed only by a professional bike mechanic.

Prior to checking tension, the chain should be inspected and lubricated which can be accomplished by removing the chain ring cover. Chain tension is adjusted by rotating the eccentric assembly with the bottom bracket shell. In the illustration above, the left-crank arm is shown removed above for clarity. It is not necessary to remove the crank arms to adjust chain tension.

To adjust the chain tension

1. Insert a 4 mm Allen key into the eccentric wedge fixing bolt and turn it counter-clockwise a few turns to loosen it. The inside of the bottom bracket shell is lubricated with grease and the wedges should release easily. However, it is possible they may stick. If this happens, with the Allen key inserted into the fixing bolt, lightly tap the Allen key with a hammer to free the wedges.
2. When the eccentric is free to rotate, insert a pin spanner (Park SPA-2 shown) into eccentric holes and use the tool to slowly rotate the eccentric in the shell. Rotate counter-clockwise to increase chain tension. Rotate clockwise to decrease chain tension. Rotate the crank arms to confirm the correct tension.
3. When you are finished, use a torque wrench to tighten the fixing bolt to **13.0 Nm, 115 In Lbs.**

NOTICE
Too much chain tension can prematurely wear the chain and cause hard rotation. Too little chain tension can result in the chain dropping from the chain ring or causing noise within the chaincase.

TIP: An exploded view of the eccentric assembly is shown on page 9.

TIGHTENING TORQUES

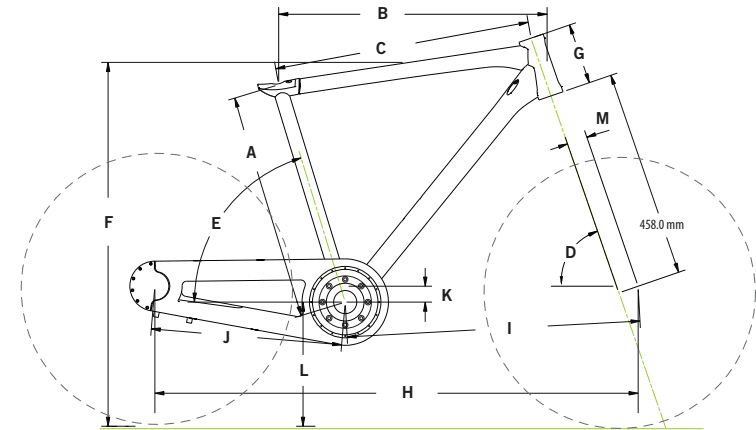
Correct tightening torque for the fasteners (bolts, screws, nuts) on your bicycle is very important to your safety. Correct tightening torque for the fasteners is also important for the durability and performance of your bicycle. We urge you to have your Cannondale Dealer correctly torque all fasteners using a torque wrench.

If you decide to tighten fasteners yourself always use a good torque wrench!

ITEM	Nm	In Lbs	
CHAIN CASE-TO-FRAME MOUNTING BOLTS	13.6	120	Loctite [®] 242™
HUB ASSEMBLY- TO-CHAIN CASE	40.0	354	grease
REAR WHEEL HUB AXLE NUT	40.0	354	grease
CRANKARM FIXING BOLTS	34	25	grease
CHAINRING SI LOCKRING	47-54	34-40	Loctite [®] 242™
REAR BRAKE ROTOR SCREWS	4.5	40	Loctite [®] 266™
CHAINCASE CABLE CLAMP SCREW	1.5	13.3	Loctite [®] 222 [®]
SI EXTERNAL BEARING CUPS	30	266	grease
ECCENTRIC FIXING BOLT	13.0	115	grease
CHAINRING COVER SCREWS	2.0	17.7	
HUB CAP BOLTS	2.0	17.7	Loctite [®] 242™
SEAT BINDER BOLT (Maximum)	5.0	44	grease
REAR BRAKE MOUNTING BOLTS (Maximum)	10.0	88.5	

Replacement Cannondale part numbers are shown throughout this supplement in **BOLD ITALIC** text.

GEOMETRY AND SPECIFICATION



SPECIFICATIONS	Size	ON	
		Medium	Large
A SEAT TUBE LENGTH (CM/IN) <i>Measured Size*</i>		44.0 / 17.3	50.0 / 19.7
B TOP TUBE HORIZONTAL (CM/IN)		56.0 / 22.0	59.0 / 23.2
C TOP TUBE ACTUAL (CM/IN)		53.0 / 21.0	56.4 / 22.2
D HEAD TUBE ANGLE		71°	71°
E SEAT TUBE ANGLE		73°	73°
F STAND OVER (CM/IN)		79.0 / 31.1	82.3 / 32.4
G HEAD TUBE LENGTH - (CM/IN)		11.4 / 4.5	11.4 / 4.5
H WHEELBASE (CM/IN)		103.4 / 41.0	106.7 / 42
I FRONT CENTER (CM/IN)		61.28 / 24.1	64.49 / 25.4
J CHAIN STAY LENGTH (CM/IN)		42.4 / 16.7	42.4 / 16.7
K BOTTOM BRACKET DROP (CM/IN)		3.5 / 1.4	3.5 / 1.4
L BOTTOM BRACKET HEIGHT (CM/IN)		30.9 / 12.2	30.9 / 12.2
M FORK RAKE (CM/IN)		4.5 / 1.8	4.5 / 1.8
CHAINLINE		53.8 mm	
SPOKE LENGTHS (mm)		3-cross - Inner: 232 mm, Outer 242 mm	
HEAD TUBE		HEADSHOK SI	
REAR BRAKE		POST MOUNT	
INTENDED USE (See page 2.)		CONDITION 2, General Purpose Riding	
MAXIMUM FORK LENGTH: **		500 mm	
SEAT POST DIAMETER:		27.2 mm	
MAXIMUM TIRE WIDTH **		26X2.1"	
MAXIMUM WEIGHT LIMIT (See page 2.)		RIDER : 300 lbs / 136 kg , LUGGAGE: 30 lbs / 14 kg, TOTAL : 330 lbs / 150 kg	

* Measured Size - center of the bottom bracket to the top of the top tube along the seat tube axis. All sizes have a slightly sloping top tube.

** See your *Cannondale Bicycle Owner's Manual* for details of these specifications.

MAINTENANCE

The following table lists only supplemental maintenance items. Please consult your *Cannondale Bicycle Owner's Manual* for more information on basic bike maintenance. Consult with your Cannondale Dealer to create a complete maintenance program for your riding style, components, and conditions of use. Follow the maintenance recommendations given by the component manufacturers for the various non-Cannondale parts of your bike.

BEFORE AND AFTER RIDING:

Check the chaincase drain hole - make sure the chaincase drain hole is clear. This small opening enables any accumulated water to drain out. See the illustration on page 3 for the location of the hole.

Check the fork. See your *Cannondale Solo Bicycle Fork Owner's Manual Supplement* for fork maintenance requirements.

EVERY FEW RIDES:

Check hub axle nut torque. **See page 18.**

Remove the seat post, lubricate, clean and lubricate the seat binder. Re-tighten with a torque wrench. **See page 20.**

TO BE PERFORMED BY A CANNONDALE DEALER (Every 100 Hours/ Annual Minimum):

Check for frame/chaincase/fork damage. Damage inspection is discussed in your *Cannondale Bicycle Owner's Manual*. See "SECTION D. Inspect for Safety."

Inspect the chain - Because the chain is enclosed in the chaincase, you may tend to forget about it. Its not immune to wear and will require inspection, cleaning, and lubrication, and tension adjustment. The chain can be viewed and lubricated by removing the chain ring cover and accessing the exposed chain, however we recommend that this service be scheduled regularly with a professional bike mechanic.

Inspect the spindle for damage or wear (bearing fit, axle thread condition).

Check the rear wheel assembly for damage (e.g., hub shell, hub bearings, spokes, rim).

Inspect eccentric bottom bracket/crank arm assemblies. Check and replace BB bearings, check tightening torques.



WARNING

ANY PART OF A POORLY MAINTAINED BIKE CAN BREAK OR MALFUNCTION LEADING TO AN ACCIDENT WHERE YOU CAN BE KILLED, SEVERELY INJURED OR PARALYZED. Please ask your Cannondale Dealer to help you develop a complete maintenance program, a program which includes a list of the parts on your bike for YOU to check regularly. Frequent checks are necessary to identify the problems that can lead to an accident.