

GUIDE TO CORRECT FRAME SIZING

The most important aspect when selecting a new bike is achieving the right fit so that you are comfortable on the bike!

The guidelines below provide information to help identify suitable frame sizes. They are intended to offer initial guidance and should not be seen as the definitive answer. They will provide a starting point from which an appropriate fit can be identified by test riding suitable options at your local Alpine Bikes shop.

In addition to the information below, useful reference material about sizing and positioning and determining correct bike fit can be found in books by coaches and racers (Eddie Borysewicz, Greg LeMond, Davis Phinney and Connie Carpenter). Additionally, commercial sizing systems such as the Fit Kit, BioRacer and Serotta's Size- Cycle can be very helpful.

YOUR INSEAM AND FRAME SIZE

The following notes refer primarily to fitting a road bike [notes about fitting a mountain bike are made where appropriate].

The best frame size for a cyclist is as small vertically as possible with enough length horizontally to allow a stretched out, relaxed upper body without over reaching the arms. This frame will be lighter and stiffer than a larger one, it will handle better and be more comfortable than a smaller one.

DETERMINE YOUR PROPER FRAME SIZE

To determine your proper frame size, you'll first need to get an accurate inseam measurement. Stand with your back against a wall, your bare feet 6" apart on a hard floor, looking straight ahead. Place a book or carpenter's square between your legs with one edge against the wall, and pull it up firmly into your crotch, simulating the pressure of your saddle while riding. Have a helper measure from the top edge of the book to the floor, in centimetres. (You can convert inches to centimetres by multiplying inches by 2.54.) Repeat two or three times, for consistency, and average the results to get your inseam length.

FRAME SIZE

Frame size refers to the length of the frame's seat tube. Pro frames are measured along the seat tube in one of two ways, centre-to-top (C-T) or centre-to-centre (C-C). C-T measures the distance from the centre of the bottom bracket to the top of the top tube or seat lug (See image below). C-C measures from the centre of the bottom bracket to the centre of the top tube. Since C-T measures to a point higher on the frame, a frame measuring 55cm C-T would also measure roughly 53.5–54cm C-C, a difference of 1–1.5cm.

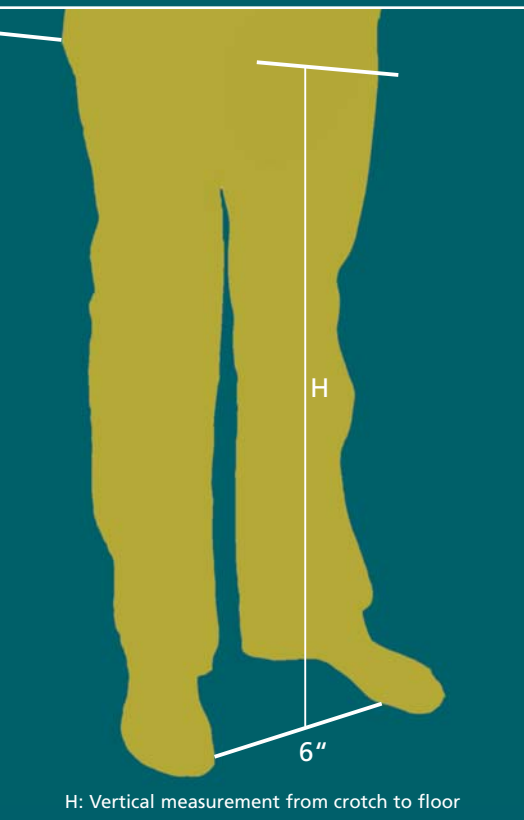
To size your C-T road frame, a guideline of 0.67 x inseam length is used. For example, if you have an 85cm inseam, your C-T frame size would be $0.67 \times 85\text{cm} = 57\text{cm}$.

LeMond's formula, from his former coach, Cyrille Guimard, establishes C-C size by the formula $0.65 \times \text{inseam length}$, which yields virtually the same frame size when you add the 1–1.5cm difference between C-C and C-T.

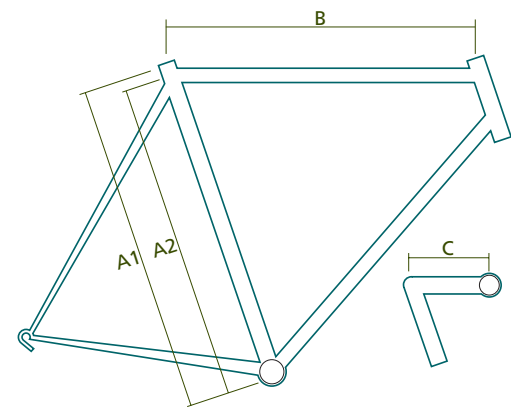
Larger riders (6'0" and up) may find that this formula puts them on a too small, and uncomfortable, road frame. A taller cyclist who wants a more comfortable frame may be better off selecting a frame 27–28cm less than inseam length, C-T.

For an XC mountain bike, we start by recommending a frame in the range of 10–12cm smaller than you take in a road frame. For example, if you ride a 55cm C-T road frame, look for a 43–45cm (17–18") C-T mountain frame. There are some obvious exceptions to these rules, primarily jump, downhill/freeride and some longer travel trail bikes. Sizing of these frames is very much down to personal preference. Generally a slightly smaller frame is preferred, allowing greater clearance and manoeuvrability

In many ways, though, it is more important to fit a mountain frame by the effective top tube length needed, rather than by the seat tube length. For instance, you might be able to get to the proper frame clearance, saddle height and neutral knee position on either a 17" frame or a 19" frame. Yet the 19" frame will likely have an effective top tube 1" longer than the 17" frame, which changes your stem length accordingly. Or, one manufacturer's 17" frame may give you a 22" effective top tube, while the next one's 17" gives you a 22.8". More on this below... just make sure that you'll be able to work out your top tube and stem length for a given frame.



H: Vertical measurement from crotch to floor



FRAME DIMENSIONS

A1 - Seat tube length [C-T]

A2 - Seat tube length [c-C]

B - Top tube length [C-C]

C - Stem length [C-C]

SADDLE HEIGHT

With the correct frame size, you'll be able to set your correct saddle height, which will be within a centimetre of $0.883 \times$ inseam length, measured from the centre of the bottom bracket to the low point of the top of your saddle. This allows full leg extension, with a slight bend in the leg at the bottom of the pedal stroke.

LeMond recommends that you then shorten this length by 3mm when using clipless pedals. Also, you might consider a slightly taller saddle height if you ride with your toes down and your heel raised. Most importantly, make any changes in saddle height gradually, and give your body time to adapt to the new position.

NEUTRAL KNEE POSITION

Put your bike in a stationary trainer, raising the front wheel to level the bike. Check your position with a video camera or mirrors in front and to the side, or with the help of a friend. Position your cleats with the ball of your foot directly over the pedal axle, and in line with any natural "toe-in" or "toe-out" foot position. Warm up by riding easily for 8–10 minutes.

Then, as you continue to look ahead, slowly stop pedalling, and bring the cranks to rest at horizontal, parallel to the ground. Check the position of your forward knee relative to the pedal spindle—for a "neutral knee position" you'll be able to drop a plumb line from just below the front of the forward kneecap, and have it bisect the pedal spindle and ball of your foot below. Remember to not raise or drop your heel or hip as you check this. Then, move the saddle fore or aft, as needed, to achieve this neutral position.

The neutral knee position serves as a good starting point for most cyclists, though many adjust it from here: long distance (stage) racers and mountain bikers often move the saddle back by 1cm or more, for power, and sprinters may move it forward, "getting on top of the gear" for quick acceleration.

One more note on frame size and geometry: if you cannot move the saddle back far enough to get your knee to the neutral position, you should look for a frame with a more relaxed seat tube angle, or consider a slightly larger frame. Alternatively you may consider a lay-back seatpost which helps to offset the saddle position. If you have trouble moving the saddle forward far enough, look for a steeper seat tube angle on your next frame, or consider a smaller frame. For most frames, a seat tube angle shallower by 1° moves the seat lug 1cm back, relative to the bottom bracket.

Finally, recheck your saddle height. If you've moved your saddle forward or back, you've effectively shortened or lengthened your saddle height, and will need to readjust it.

TOP TUBE AND STEM LENGTH

Correct reach to the bar gives you easier breathing, better neck and lower back comfort, and better weight distribution and bike handling.

That "ideal position" varies here more than anywhere else for cyclists, depending on riding style, flexibility, body proportions, and frame geometry, among others. And, your upper body position will evolve with more hours in the saddle. That is, you may find that you develop a lower, longer position as your fitness and flexibility improve.

Unfortunately, there is no formula for sizing the effective top tube and stem that works as well as the inseam method. One indicator comes from glancing down at the front hub while riding in the drops; your view of the front hub should be obstructed by the handlebar. LeMond recommends that your elbows, bent at $65\text{--}70^\circ$ with your hands in the drops, should be within an inch or two of your knees at the top of your stroke.

Ultimately, the best resource you have is your own experience, especially when teamed with feedback from a coach or knowledgeable cycling shop, or video or mirror analysis. Drawing on your expertise, and ours, together we can set you up on a bike that feels like a natural extension of your body, and invites you out to ride for hours at a time!



- K forward knee cap
- B ball of foot
- S pedal spindle