



# Ontario Cycling Association

307 – 3 Concorde Gate, Toronto M3C 3N7

Tel: (416) 426-7416, Fax: (416) 426-7241

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## Road Communiqué – Bike Measurement

This communiqué is to describe for the road racing community some of the equipment regulations surrounding bike measurements as applied in Ontario. This summary is meant to highlight some of the more important UCI rules regarding your bicycle. Unless specifically noted otherwise, these rules apply to both time trial bikes **and** bikes used for mass-start road races.

This is not an all-inclusive summary and is not intended to explain in detail each dimension that is regulated. The UCI Rules provide complete information, and take priority in case of any conflict with the summary below. Riders are strongly encouraged to become familiar with the official rules.

**Riders are responsible for ensuring their equipment is in conformance with the rules at all times.**

There are a number of framesets, forks, handlebars, saddles, seatposts, and wheelsets, available on the market that are not UCI-compliant. Riders planning on participating in sanctioned race events are advised to ensure purchased components, or stock components included on complete bikes, are in compliance with the regulations.

Note that having a professional “bike fit” performed does **not** guarantee a bike will comply with the bike measurement regulations.

Commissaires may elect to verify conformance with the rules at any event, **not** just time trial events. Riders should verify their bike setup in advance of race day.

At time trial events riders are expected to present a bicycle that is in conformity with the regulations. There may not be an opportunity to have a pre-check measurement performed by the commissaires at an event, as efforts will be focussed on performing final measurement checks on bikes prior a rider’s start time. Similarly, while performing final measurement checks there may be insufficient time to allow a rider to make adjustments if the set-up is found to be non-compliant. Once a final measurement check is performed a bike **must** remain in the start area.

### **Background**

Part 1 (General Organization of Cycling as a Sport), Chapter 3 (Equipment) of the UCI Rulebook defines the regulations regarding bicycles used within the road discipline. The specific rules are **1.3.001 through 1.3.025**. These rules have been in place for a number of years, with minor revisions or clarifications made periodically. The UCI has also published an explanatory document titled “Technical Regulations for Bicycles, A Practical Guide to Implementation”, providing guidance on interpretation of the rules. Links to these documents are provided below.

Many aspects of the rules have specific performance implications and must be strictly enforced to ensure competitive fairness. This is particularly true for time trial equipment (i.e. saddle position, length of bar extensions, etc.).



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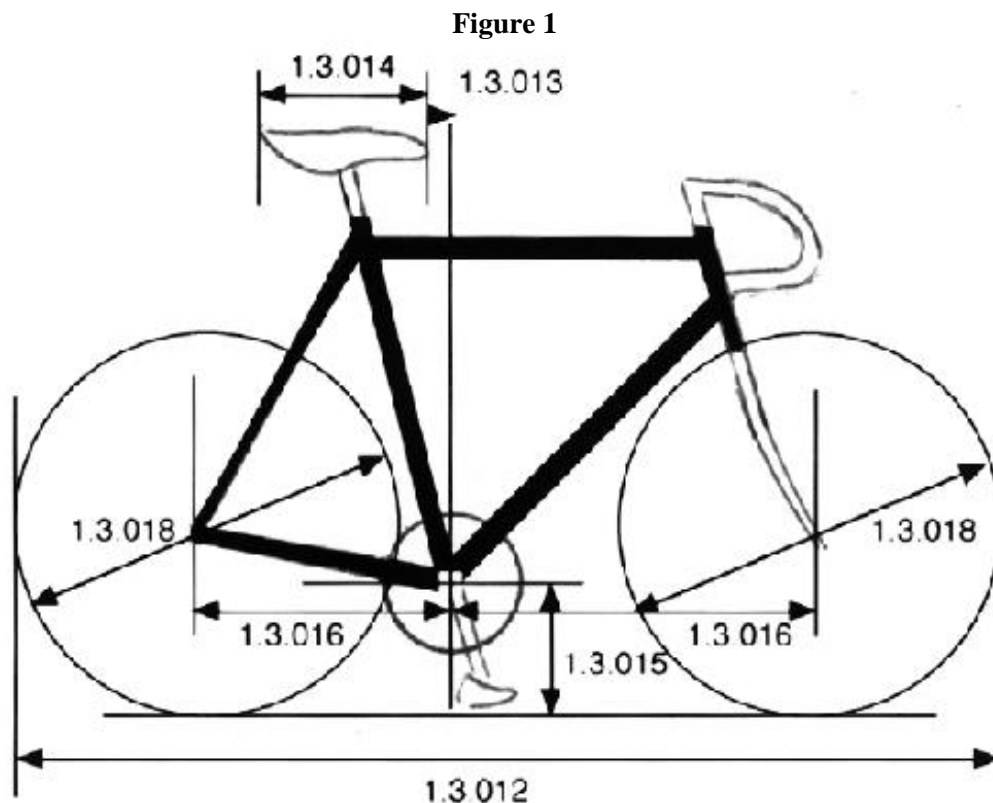
## General Requirements

The bicycle must be in “working order” with the front wheel steerable and the rear wheel driven through a system comprising pedals, a chain, and a chainset (gears, cranks, etc.). The use of a fixed gear in competition is prohibited. The bicycle must have handlebars which allow it to be ridden and manoeuvred in any circumstances and in complete safety.

Bikes must weigh at least 6.8 kilograms (**1.3.019**). Bikes weighing less than the minimum must have weight added to meet the minimum weight. Water bottles, tool bags, pumps and such items that can simply be removed from the bike are not counted in the minimum required weight.

Bikes must have brakes on both wheels, operated with levers (**1.3.022**).

*Figure 1* below provides a graphic representation indicating the rule numbers corresponding with some of the key measurements that bikes must comply with. Many of these measurements are determined by the frame and component manufacturers themselves and are not user adjustable.



## Frame

The overriding principle required for frame design is a “double triangle”, the front triangle formed by the seat, top and down tube, the second formed by the seat tube and rear wheel stays. Rules **1.3.020** and **1.3.021** provide specific information as to the configuration of the frame elements.



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The UCI has instituted an approval program for new frames/forks (manufactured since January 2011) which allows manufacturers to have their designs reviewed and approved by UCI prior to fabrication. Frames/forks approved as part of this program receive a UCI approval sticker indicating the geometry of the frame/fork is UCI-compliant.

Bikes with UCI approval stickers on the frame/fork are still required to be presented for bike check, as the approval sticker does not cover all aspects of the bike configuration, set-up, or user-adjustable settings.

## Wheels

Wheels must be of equal size (**1.3.006**), with a diameter (including tire) greater than 550 millimetres and less than 700 millimetres (**1.3.018**).

For mass-start road races wheels shall either meet the definition of a “traditional wheel” or be specifically approved by the UCI (**1.3.018**). The regulations define a “traditional wheel” as any wheel with a rim with any cross section dimension no larger than 2.5 cm and with a minimum of 16 metallic spokes, whose maximum cross section does not exceed 2.4 mm. The list of UCI approved wheels (see link below) currently lists over 150 wheels, but there are still many wheels that are unapproved.

## Rider Position

The rider shall normally assume a sitting position on the bicycle. This position requires that the only points of support are the following: the feet on the pedals, the hands on the handlebars and the seat on the saddle (**1.3.008**). For time trial events handlebar extensions are allowed to have additional support for the elbow or forearm (**1.3.023**).

## Saddle

The saddle must be between 24 and 30 centimetres long, and the saddle support must be horizontal (**1.3.014**).

One of the primary fit regulation issues is the location of the nose (tip) of the saddle in relation to a vertical line through the bottom bracket. The nose of the saddle must be a minimum of 5 centimetres behind a vertical line passing through the centre of the bottom bracket (**1.3.013**). See *Figure 2* below.

There is a *morphological exemption* which allows the saddle to be less than 5cm behind the center of the bottom bracket. The rider is placed on their bike in their normal riding position. In this position the front of their knee **must** be behind a vertical line through the pedal spindle when the pedals are horizontal. Shorter riders or those with small frames are more likely to need this fit test performed. See below for further information regarding *morphological exemptions*.

The saddle nose is never, in any circumstances, allowed to be in front of a vertical line through the centre of the bottom bracket.

There may be situations where an offset seatpost or shorter saddle are required to satisfy the saddle position regulations, however it is not permitted to cut the nose off the saddle to do so.





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Handlebars of any kind must be lower than a level line drawn horizontally from the top of the saddle. The lowest part of the bars must also be higher than the top of the wheels (**1.3.022**).

For time trial events, handlebar extensions may be added (**1.3.023**). These extensions, whether a clip-on attachment or a complete replacement handlebar, may offer forearm support, but cannot be designed to allow pulling or applying leverage against the handlebars.

Handlebar extensions **must** be positioned so that the rider's arms are parallel to the ground when in use.

The maximum forward horizontal dimension of the handlebar extensions is 75 cm (**1.3.023**). This distance is measured horizontally from the center of the bottom bracket axle to the end of the extension, as shown in *Figure 4* below.

If gear shifters are installed on the bar extension any part of the shifter that can be gripped (e.g. the shifter body) must be within the 75 centimetre limit.

For electronic style shifters the measurement is taken at the furthest point of the bar extension or shifter body. For friction and index style shifters the measurement is taken at the pivot point of the shifter, and the moving (lever) part of the shifter is not included in the measurement.

Some newer style shifters have a “return to centre” feature which allows the shift lever to return to a fixed home position after each gear change. If the fixed home position is inline with the bar extension then the entire shift lever is included in the measurement. If these shifters are adjusted such that the fixed home position is angled up or down from the plane of the bar extension, then the measurement is taken at the pivot point of the shifter.

There is a ***morphological exemption*** that allows the bar extension to be up to, but not exceeding, 80 centimetres from the vertical line through the bottom bracket. The rider is placed on their bike in their normal riding position. In this position, the angle of the rider's arm at the elbow **must** be less than 120 degrees. This test is more common for taller riders. See below for further information regarding ***morphological exemptions***.

### **Morphological Exemptions**

Based on the height and limb length of the rider there are two possible morphological exemptions that could apply to the rider's bike setup. The **saddle position exemption** allows the nose of the saddle to be between 0 and 5cm behind the center of the bottom bracket. The **bar extension exemption** allows the bar extension to extend between 75cm and 80cm from the center of the bottom bracket. A rider may claim **ONLY ONE** of the exemptions.

Riders should be familiar with their bike setup and be aware if they require a morphological exemption. At higher levels of events riders may be required to specify the exact measurement that their saddle or bar extension position deviates from the standard configuration (saddle minimum 5cm behind bottom bracket or bar extension maximum 75cm ahead of bottom bracket).



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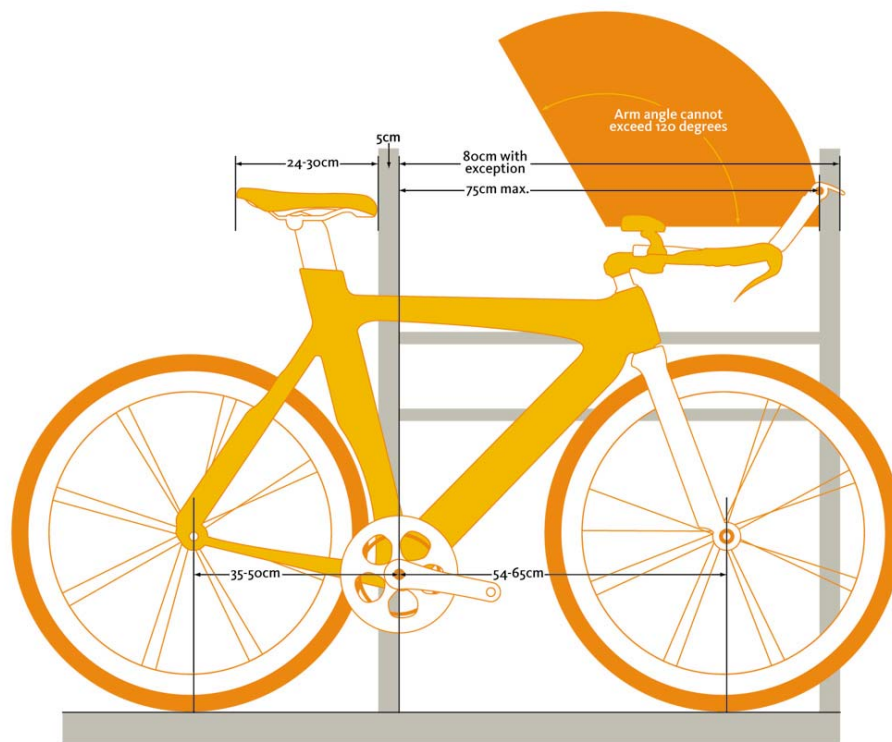
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Riders claiming a morphological exemption must do so in advance of presenting their bicycle for measurement, either when registering for the event (if requested) or when presenting their licence at registration. A morphological exemption may not be requested after measurement of the bicycle has commenced if the bike setup is found to be non-compliant.

*Figure 4* below illustrates how a bike measurement jig is utilized to quickly verify some of the key measurements described above. The two morphological exemptions are verified by having the rider sit on the bicycle and assume their normal riding position, allowing the position of the knee relative to the pedal axle, or angle of the arms, to be checked.

**Figure 4**



### **Fairings and Aerodynamic Additions**

Additions intended to reduce air resistance, such as tape, are not permitted. This includes tape on quick releases, at frame joints, on helmets, etc. **(1.3.024)**

Frames with seat tubes that may act as a fairing for the rear wheel must pass the “credit card” check. It must be possible to pass a credit card between the frame and the wheel without bending the card **(1.3.024)**.

### **Aerodynamic Profiles (3:1 ratio)**

No part of the bicycle may have an aerodynamic profile (fuselage form) that exceeds a ratio of 3 to 1, unless specifically noted in the regulations. This 3:1 ratio means the widest dimension of a component cannot be



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more the three times larger than the corresponding narrowest dimension. For example, if the height of a component is 1cm then the width of the component cannot be more than 3cm.

This 3:1 ratio applies to the main structural parts of the bicycle, including seatposts, handlebars, fork, stem etc. and to frame elements.

The aerodynamic profile of seatposts, handlebars, and forks, has received greater scrutiny in the past few years, with many popular components found to be non-compliant (ie. 3:1 ratio exceeded). It is **NOT** permitted to modify a piece of equipment by attaching something to it post manufacture to bring that item into compliance. For example, adding material to a component to beef up its aerodynamic profile is **not** allowed.

In the case of forks, each side of the fork is considered a single element and is required to satisfy the 3:1 ratio. This means the left fork leg, and the right fork leg, must each satisfy the 3:1 ratio. Forks with split legs (ie. a single fork leg splits to create an air gap) are treated the same as regular forks, with the left and right sides of the fork each being considered a single element that must satisfy the 3:1 ratio.

The 3:1 ratio does not apply to wheels, pedals, cranks, derailleurs, brake calipers, water bottle cages, brake levers, gear levers, but in all cases knife edge profile shapes or other unsafe designs are prohibited (**1.3.001**).

### Useful Links:

- UCI Rule Book:
  - <http://www.uci.ch>
    - click on RULES on the right side menu for Part 1 Rules and Practical Guide for Measurements
    - click on EQUIPMENT on right side menu for list of Approved Models of Frames/Forks
    - click on EQUIPMENT on right side menu for list of Approved Non-Standard Wheels
- CCA modifications to UCI rules:
  - [http://canadian-cycling.com/cca/coaches\\_officials/officials\\_policy.shtml](http://canadian-cycling.com/cca/coaches_officials/officials_policy.shtml)
    - scroll down and click on COMPANION GUIDE

### College of Ontario Road Commissaires

On behalf of the OCA Officials Committee