



**1. NECK ANGLE:** Depends on the cyclist's age/ability and whether he has neck or shoulder pain. Younger, more aggressive riders can have 45-60 degrees of cervical extension. Those older or with neck pain or previous neck injury should have a neutral cervical spine or extension of 20 degrees or less. This can be accomplished by raising the stem or increasing the stem angle.

**2. SHOULDER ANGLE:** Should be 90 degrees or less when measuring from humerus to thoracic spine. You can also measure humerus to greater trochanter, which should be 80-90 degrees. Increased shoulder angle causes increased use of latissimus musculature to support the upper body.

**3. SPINE:** The cyclist should have a neutral thoracic spine and a basically flat lumbar spine. There will not be a lordotic curve in the lumbar spine but you also don't want excess flexion in the thoracic or lumbar spine. It should be close to level or flat; no flexion moments anywhere between vertebrae. These can cause points of hypermobility and pain.

**4. HIP ANGLE:** You have to measure PROM of the hip, specifically in flexion, to determine flexibility. You don't want a greater angle at the top of the

pedal stroke than the cyclist's passive hip flexion. So, hip angle at the top of pedal stroke should be equal or less than PROM into hip flexion. If the hip isn't flexible, the spine will be the hinge.

**5. ELBOW ANGLE:** Should be 30-45 degrees of flexion. Straight elbows mean you are not relaxed and bars are too far away.

**6. WRIST:** Should be in a relaxed position or anatomical rest position.

**7. KNEE ANGLE:** Should be 25-30 degrees with the pedal at dead bottom center or the crank arm in line with the seat tube.

**8. ANKLE ANGLE:** This varies throughout the pedal stroke. The rider should not have excessive plantar flexion at the bottom of pedal stroke. Plantar flexion should be between about 35-55 degrees, with the crank arm in line with the seat tube. This is not something I measure; I look at the whole picture to determine what the ankle position should be.

\* If your patient is a cyclist and is having increased pain while cycling, find someone in your area who can fit him correctly on the bike. I am partial to PTs doing bike fits since they have substantial knowledge of correct body mechanics.

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