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Bike Testing Inc.

(an independent testing laboratory)

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SAMPLE BICYCLE CRANKSET STIFFNESS RESULTS

Crank	Length (mm)	Weight (g)	Comp (lbs/in)	Left (lbs/in)	Right (lbs/in)	Combined	Stiffness-to-weight
2002 Shimano Dura Ace	172.5	784	470.2	437.9	528.6	478.9	0.6108
2002 Shimano Tiagra w/ un-52	170	1086	614.7	392.4	573.9	527.0	0.4852
2001 Campagnolo Record 10spd	175	868	428.1	316.0	537.6	406.4	0.4683
YOUR CRANK HERE	?	?	?	?	?	?	?
YOUR CRANK HERE	?	?	?	?	?	?	?

How to read this report:

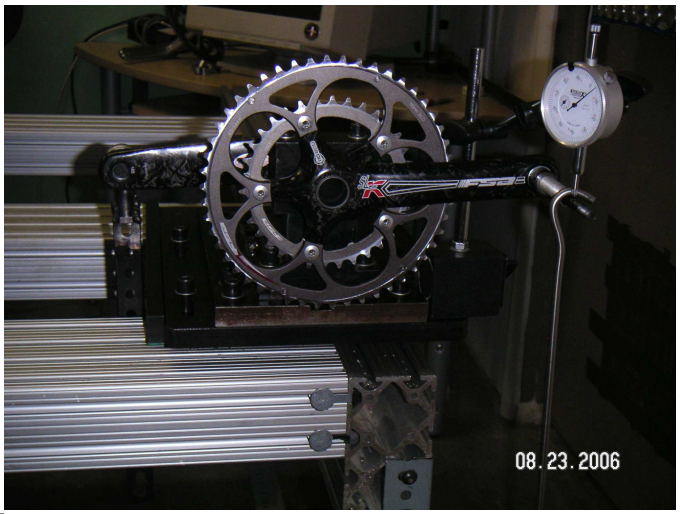
First, remember these numbers can never replace actually ride testing and the experience of working with the parts themselves. These test results are just one set of numbers which must be integrated with other factors, such as reliability, durability, weight considerations, price point and so on.

That said, I prefer the "combined" stiffness score since it is the average of the three measures. Crank manufacturers tend to publish the "Compression test" as "the stiffness". This may be due to the fact that this is the easiest number to reproduce and tends to be (perhaps for safety reasons) the number that interests manufacturers the most. Compression represents the stiffness you would experience standing on both pedals and pushing down, but it might not be the best measure of stiffness from the rider's perspective. The "Right" crank measure represents the stiffness of pedaling with the right pedal; the stiffer the crank, the more inches it (and therefore the bike) should travel given the amount of effort (force) exerted by the rider. Similarly, the "Left" crank measure closely represents the stiffness when pushing on the left pedal. Because the left crank is opposite the chain sprocket while the right is attached directly to it, the left crank's stiffness typically measures lower as the force on the pedal must travel through the bottom bracket spindle to reach the chain sprocket. Finally, the cranks are ranked by their average stiffness-to-weight (lbf/g) ratio as weight is a constant concern for riders. This ratio is calculated by taking the combined result and dividing it by the weight of the crank in grams. Obviously it is easier to build a stiff but heavy crank than one that is both stiff and light.

Of course, there are other mechanical factors which also impact a crank's performance from the perspective of the rider. For example, at *biketesting.com* we also provide friction test reports on bottom bracket bearings. No matter how stiff the crank is, you also want the crankset's bottom bracket bearing to be as frictionless as possible.

Hopefully this explanation helps improve your understanding of this report. Happy chasing!

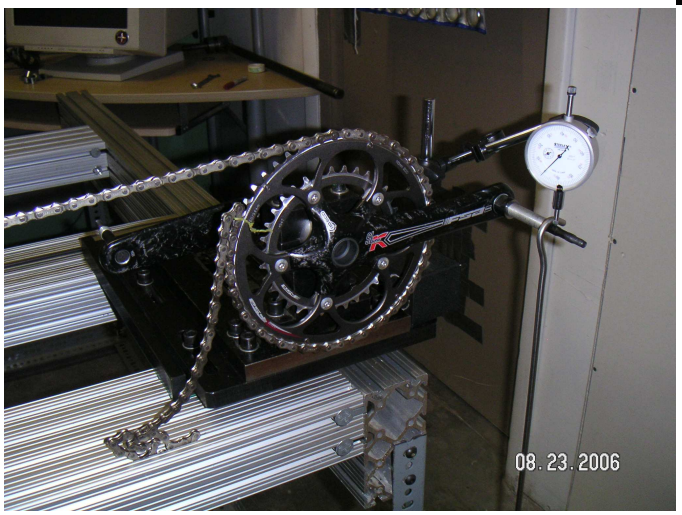
TEST PROCEDURE: Stiffness testing of bicycle cranksets



STIFFNESS TEST

Procedure for crank compression stiffness:

The crankset is installed into a fixture which holds the bottom bracket solidly. The left crank arm has a pedal spindle installed and is then attached to an arm which keeps the assembly from rotating. A pedal spindle is installed into the right arm and an 11lb preload is set at 2.5" from the crank arm surface. Weights are added in the following sequence 3lbs, 5lbs, 8lbs, 10lbs, 13lbs, 15lbs, 18lbs. The deflection at each weight is recorded, thus developing a graph of weight versus deflection (stiffness).



Procedure for left crank stiffness with chain-load:

The crankset is installed into a fixture which holds the bottom bracket solidly. A chain is wrapped around the large chain-ring and then fixed to a post. A pedal spindle is installed in the left crank arm and a preload of 11lbs is placed at 2.5" from the crank arm face. Weights are added in the following sequence 3lbs, 5lbs, 8lbs, 10lbs, 13lbs, 15lbs, 18lbs. The deflection at each weight is recorded, thus developing a graph of weight versus deflection (stiffness). Note that the forces travel through the bottom bracket spindle for a left crank stiffness test.

Procedure for right crank stiffness with chain-load:

The crankset is installed into a fixture which holds the bottom bracket solidly. A chain is wrapped around the large chain-ring and then fixed to a post. A pedal spindle is installed in the right crank arm and a preload of 11lbs is placed at 2.5" from the crank arm face. Weights are added in the following sequence 3lbs, 5lbs, 8lbs, 10lbs, 13lbs, 15lbs, 18lbs. The deflection at each weight is recorded, thus developing a graph of weight versus deflection (stiffness).

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