



Darkhorse Crankworks
10629 Highway 42
Newton, WI 53063
Village of Osman

Since 1980

NO SPIN ZONE **STATIC BALANCE &
DYNAMIC BALANCE**

P: 920-726-4990 F: 920-726-4991 E: John@Darkhorsecrankworks.com W: www.darkhorsecrankworks.com

Definition of Dynamic Balance n: (aeronautics) the state of equilibrium in which centrifugal forces due to a rotating mass (e.g., a propeller) do not produce force in the shaft and so vibration is reduced

First things first, all of our flywheel assemblies are both static and dynamically balanced. We take the time to balance each individual part, which equates to our flywheels in their assembled form dynamically balanced, pure physics and simple.

Gravity solely determines balance. In our world of AMA Superbike motorcycle racing, where teams have multi-million dollar budgets and where money becomes no object, every tire is static balanced. Why? We can go in excess of 200 MPH, but here again, nothing determines balance better than gravity itself!

A lot of people talk about static and dynamic balancing pro's and con's, we write this strictly as it pertains to your **Harley Davidson® flywheels**. This is no trick and we will explain why we do it this way and why the spin balancing method to achieve a dynamically balanced flywheel is not the best way to balance your Harley Davidson® flywheel assembly. Our **27 years of experience building Harley Davidson Flywheels** has given us the knowledge in balance factors that complete our process allowing us to tailor your crankshaft for its intended RPM range.

Automotive-based equipment is great for its intended use, long 1-piece crankshafts with multiple rod journals that cannot be disassembled. An automotive type crankshaft does not allow you to determine balance of each individual rod journal, shaft and associated counter weight, this is why the spin balancer was invented and it works well to achieve a dynamically balanced automotive crankshafts in large volume.

With your crankshaft, you have 2 separate flywheels with 1 common crankpin mating them together.

Diagram A shows a dynamically Imbalanced flywheel.

This flywheel may be static balanced as a unit, but not dynamically balanced, which means neither end would fall due to gravity, but having the weight in opposing areas would make it want to shake being that the center of gravity is not in parallel with the flywheels.

Diagram B shows OUR corrected & dynamically balanced flywheel. This flywheel is completely balanced being that each individual part has been balanced using the exact same ratio's, which moves center of gravity in parallel with flywheel center and the sums of all parts are then dynamically balanced.

There are 2 ways of achieving diagram B, there is the **Darkhorse Crankworks way,** and then there is the automotive way (spinning at 500-750RPM) that is reconfigured and loosely adapted to achieve balance in your crankshaft. The biggest problem (there are others, but we are talking only about balancing at this point) with the automotive style of achieving this is that the connecting rods must be removed, the crank is then reassembled without rods, trued to within factory specs, spin balanced, dis-assembled once again, rods and bearings replaced and then it must be re-assembled. It then must be in the same identical spec it was spin balanced or you can throw the whole process out. **This is why S&S developed their own spin balancer to balance their crank assembly fully assembled & rods in place, not to be taken apart again after balancing.**

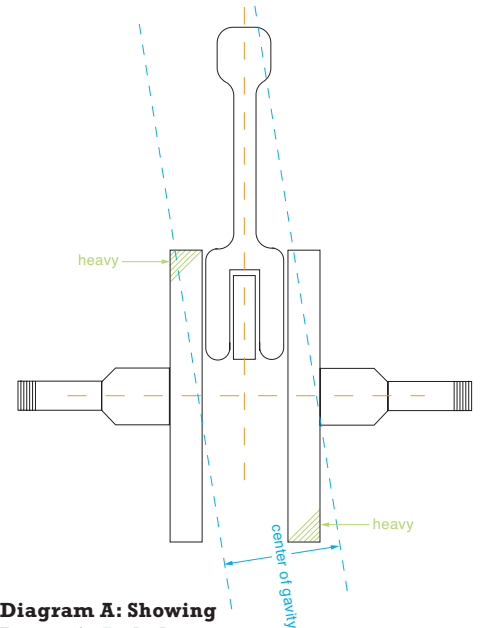


Diagram A: Showing Dynamic Imbalance

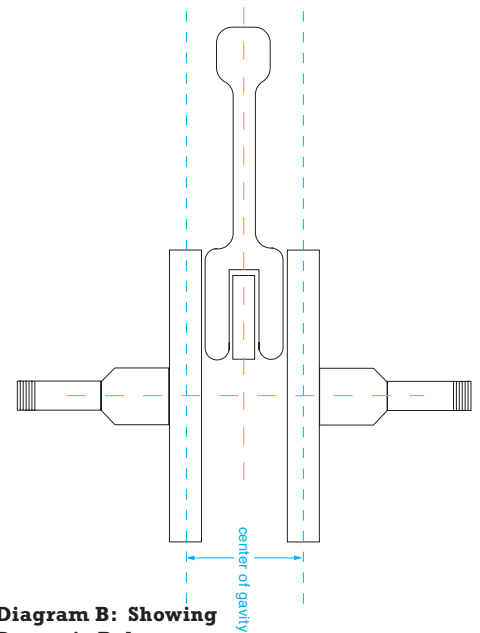


Diagram B: Showing Dynamic Balance

We have spent the last 27 years perfecting our processes, we have consistently reviewed & improved on them, and our dealers and customers know that all equates to the smoothest crankshafts in the country. Pure and Simple.

