Vibration Isolation through balancing.

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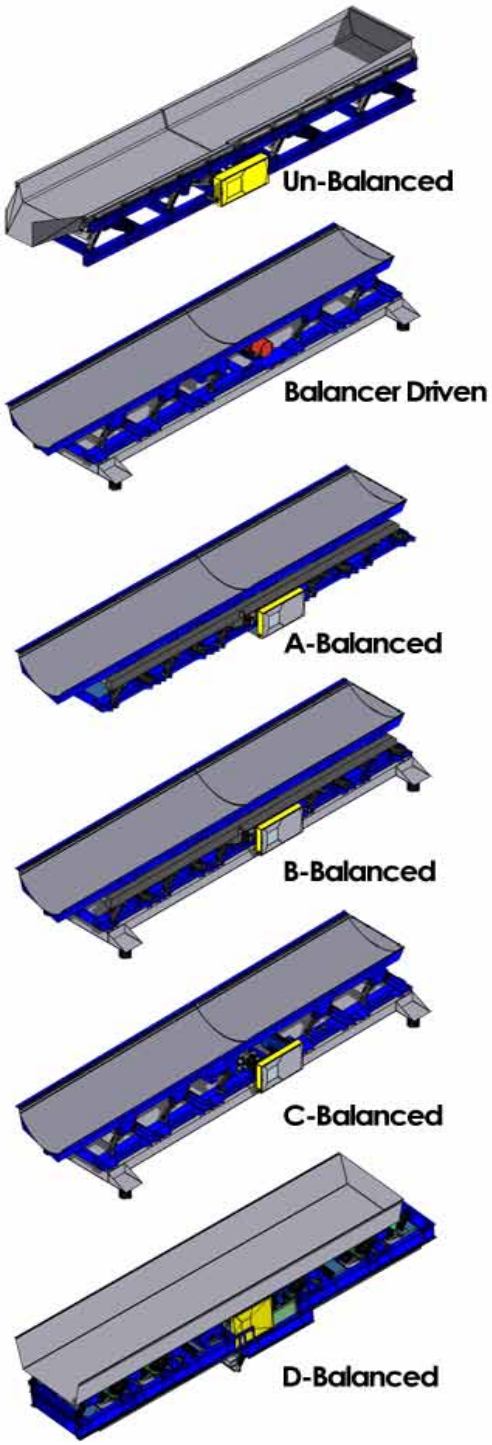
As vibratory equipment operates, it generates reactive forces to move the material. To counteract this reactive force, different styles of balancing can be employeed.

Unbalanced: When a substantial mounting structure or foundation exists, vibratory equipment can be operated without a counteractive force.



Balancer Driven: Some manufacturers offer a vibratory design where a transport surface is mounted to a weighted balanced frame using a reactor spring assembly, and the weighted base is isolated from the ground using isolation springs. The vibrating motor or drive on this type of conveyor is mounted to the balancer, and does not directly drive the transport surface. There are significant flaws in the physics of this design. For one, the natural frequency of the suspension system is typically around 50 percent of the operating speed of the motor. If the motor speed is reduced, this will cause the vibratory unit to approach the natural frequency of the suspension system, causing erratic operation. Another problem with this design is that it does not respond positively to changes in material weight, so the effect of balancing on this type of isolation is only around 60 to 65% effective. This design is also more likely to lose conveyability if the transport surface is overloaded with product. General Kinematics does not recommend this type of vibratory conveyor for these reasons.

A-Balanced: "A" balanced conveyors typically have a counterpoise frame equal to the trough weight supported on the conveyor base by duplicate trough reactor assemblies, and is positively driven 180 degrees out of phase with the transport surface.This results in an equal and opposite reaction along the rigidly mounted base of the conveyor.

B-Balanced: "B" balanced conveyors are similar to design A, except that the entire conveyor is mounted on a floating spring - mounted sub-base for the ultimate in isolation efficiency

C-Balanced: A "C" balanced unit uses a weighted frame isolated from the mounting surface by springs. The base is typically four times heavier than the weight of the transport surface above, and the heavier the base, the greater the isolation it provides. During operation, this weighted lower base runs 180 degrees out of phase with the transport surface, counteracting the forces generated above. This design offers high isolation efficiency with maximum economy for many applications.

D-Balanced: A "D" balanced vibratory device is comprised primarily of two separate and distinct masses, one designed to carry material and the other mass designed to offset dynamic loads that would normally go into a structure. These two masses normally run 180 degrees out of phase so that they cancel forces or minimize forces going to the earth. The design is different than other types of balanced conveyors in that the balancer reacts positively to material load which changes the dynamic characteristics. This positive reaction more closely isolates or cancels the vibratory forces of the transport mass. This design is ideal for structures or situations with a poor or light grounding structure, and are 90 to 96% efficient in eliminating vibration into the ground. In rare circumstances where absolutely no vibration transfer is acceptable, this design can also be isolated from the ground, and is the most effective balancing design available.