

MD Alignment

Are Alignments on Trucks and Buses a GREEN procedure or a Money Drain (Part 24)

Vibrations

Typically vibrations come from two sources, the drivelines or the front end. Driveline vibrations tend to show up in the seat or the feet of the operator. These can originate from any components in the driveline including the vibration dampener on the front of the engine all the way through to the tires on the drive axles. Improper wheel or tire mounting, lack of balance in the tires rims or drums, loose wheel bearings, incorrect ride height and on and on the litany of possibilities goes. The one thing that I have never seen solve a driveline vibration is wheel alignment.

On the other hand front end vibrations first show up in the steering wheel. As the vibration gets worse the whole cab can shake but it will start in the steering wheel. These vibrations tend to run in three speed ranges on 19.5 to 24.5 tires.

If the vibration starts at speeds over 60 MPH the cause tends to be a lack of balance in the spinning assembly. Properly balancing the wheel, tire, drum and hub normally solves this complaint. Errors can occur here if you only balance the tire and wheel.

Vibrations that start at speeds under 40 MPH and get worse the faster you go tend to come from out of round tire/wheel assemblies. Very few quality tires today are manufactured out of round however the tire can be installed on the rim off center or the rim can be installed on the hub off center which will produce an out of round condition. In addition, an improperly installed drum can cause intermittent drag that will wear the tire out of round. Also improper toe or drive axle alignment can cause the tire to drag sideways creating an irregular pattern that can evolve into an out of round condition.



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Between 40 and 60 MPH vibrations are a product of conflicts in the dynamic positioning of the steer tires. Below about 45 MPH (this depends on the exact tire size) the negative drag on the tires is the dominate factor holding the tire stable. Above that speed centrifugal force caused by the spinning tire become the dominate factor. The negative drag force at lower speeds wants to move the tire to a toe out position while centrifugal force want the tire to move to a zero toe position. If there is any disagreement between these two forces a vibration can be manifested during acceleration up to about 55 MPH. It will not normally be present when you decelerate thru this speed range. If the vibration is present during both accel and decel then there usually is a problem in the Kingpin. A bad bearing or improperly lubrication can cause a stutter during the toe change resulting in the vibration.

Vibrations or shakes that come out of hitting bumps in the road tend to be suspension or steering gear issues. Air in the hydraulic steering gear, fatigued springs or improper use of caster wedges are common problems in the area.

