

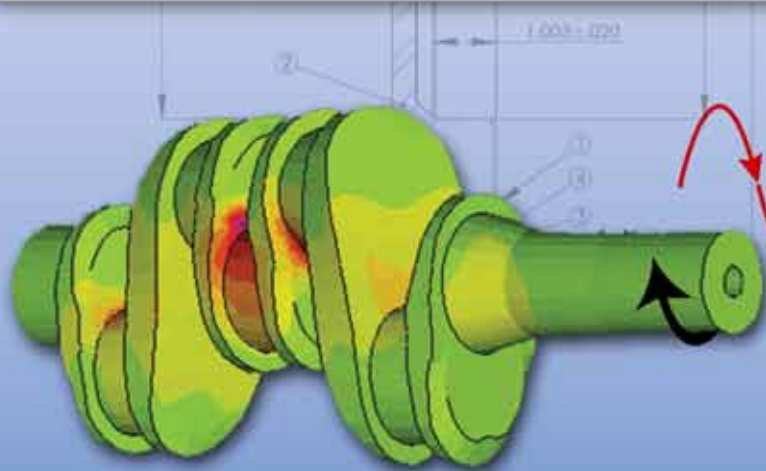
How A Vibratech TVD® Damper Works

1 THE PROBLEM: Crankshaft Torsional Vibration

Torsional vibration occurs naturally from the crankshaft flexing ahead of its natural rotation by the force of combustion, then rebounding when cylinder pressure is relieved. Peak-to-peak twist can be 1° or more!

Torsional vibration robs power, fuel economy and causes engine wear. Continuous flexing of the crankshaft also causes metal fatigue and crank failure, much like bending a nail back and forth until it breaks.

All factors of generating torque & crankshaft design affect the magnitude of torsional vibration. RPM amplifies the frequency.



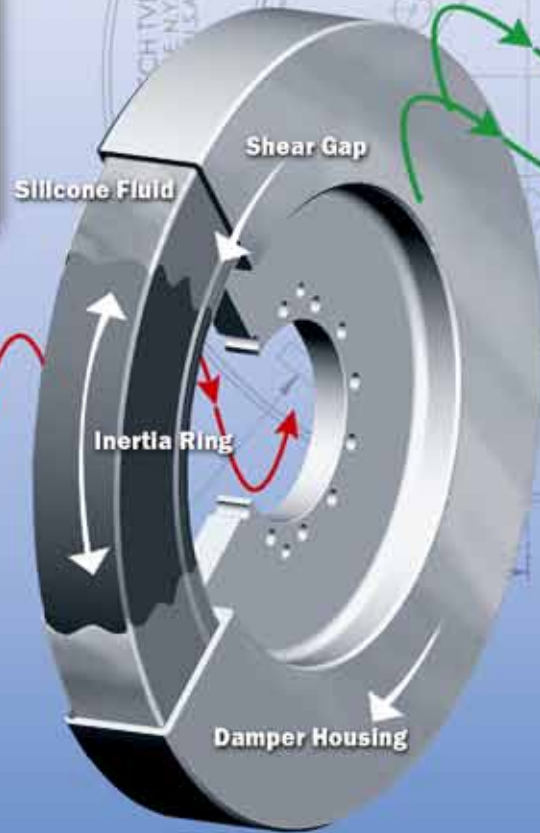
Computer simulation of torsional vibration. Areas in **RED** depict dangerous levels of crankshaft deflection.

2 THE SOLUTION: The Vibratech TVD Advantage

A Vibratech TVD damper automatically self-tunes to optimum damping of crankshaft torsional vibration in real time. Silicone fills the space (shear gap) between the housing and inertia ring. Silicone, which is 45,000 times thicker than 30w motor oil, is an excellent damping medium because of its tensile strength, density and low friction properties.

Torsional vibration resonates the inertia ring and momentarily causes it to shear through the silicone. This shearing action converts the kinetic energy of torsional vibration into heat which radiates through the damper housing.

The result is reduced wear on the main bearings and timing gear, increased efficiency through more accurate valvetrain operation and a lower risk of crank failure.



Torsional vibration safely dissipated as heat.

Vibratech TVD® Reference Chart

Vibratech TVD Recommends Crankshaft Damper Replacement Every 500,000 Miles / 15,000 Hours

- Silicone in a new viscous damper is clear & approx. 45,000 times thicker than 30w motor oil.
- This allows the damper to tune to crankshaft torsional vibration in real time.
- Normal operating conditions will cause silicone to gradually solidify over an extended period of time. As this occurs, the damper's ability to tune in real time is diminished.
- If not replaced at the recommended interval, eventually the silicone will polymerize into a solid paste and lock the internal inertia ring.
- Once this occurs, it will lead to catastrophic engine failure.

Signs Of A Worn Crankshaft Damper

- Broken crankshaft
- Accessory drive gear wear
- Broken accessory brackets
- Driver fatigue caused by engine vibration in the cab
- Throwing or slapping of belts
- Loss of torque & horsepower
- Loss of fuel economy
- Damper housing damage

Owner/Operator Advantage

A new Vibratech TVD damper installed at the correct intervals will help reduce engine wear, achieve more accurate valvetrain operation and lower the risk of crank failure.

Vibratech TVD protection starts at only \$1 per 1,000 miles.

A smoother running powertrain will help restore power and lost fuel mileage.

Vibratech TVD is a trusted name known world wide.
Supporting the trucking industry for over 65 years.

**Made 100% in the U.S.A.
ISO 9001:2008 Certified**

*Replacing the damper **DOES NOT** fix wear or undue neglect of proper maintenance to engine components.*

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Viscous Damper Wear - Mileage / Hours



This damper was not changed during rebuild.
This lead to engine failure within two months.
Black, solid silicone indicates excessive damper wear.

The silicone in a Vibrattech TVD damper is clear & gel-like in viscosity.

- Recommend replacement every 500,000 miles or 15,000 hours.
- Silicone in a new viscous damper is clear and approx. 45,000 times thicker than 30w motor oil.
- This allows the viscous damper to tune to torsional vibration in real time.



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Torsional Vibration - Metal Fatigue Damage



Broken crankshafts caused by uncontrolled torsional vibration.



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