

## Dodge® mounted bearings: why thread-lockers should not be used on setscrews

In an effort to maximize holding power of mounted bearings and other power transmission components to a shaft, setscrews are commonly used. Applied torque causes a setscrew to bite into the shaft. The reaction force between the setscrew, threaded hole, and shaft causes the setscrew to compress. When compressed, the setscrew acts as a stiff spring and provides holding power. If a setscrew is not properly tightened, sufficient compression of the set-screw may not be achieved and vibration may cause the setscrew to back out. This occurs more frequently in high speed applications.

Setscrews used on Dodge products must meet very specific requirements regarding socket and thread forming, style, and overall quality. Due to these strict requirements, thread locking adhesives are not required. For additional information about the quality and holding power of Dodge setscrews, please reference white paper WP0276.

The torque required to achieve the necessary clamp load for dry setscrews is greater than the torque required for lubricated setscrews. Dry setscrews have a higher coefficient of friction, requiring greater wrench torque to achieve the necessary clamping force. Lubricated setscrews have a lower coefficient of friction, resulting in lower required torque ratings. Dodge provides dry torque values in every installation manual.

Due to concerns over setscrews coming loose, thread-locking adhesives are sometimes used to “lock” the setscrew tightly into the threaded hole. However, thread lockers can act as a lubricant. If a lubricant is used with dry torque ratings, excessive force will be created which may result in a fracture of the threaded surface. This can occur during the installation of the setscrew or when the application experiences an impact force. This is most common in ball bearings because the inner ring is threaded and has a thinner material thickness. **Figure 1** illustrates the damage to a setscrew mounted ball bearing inner ring due to excessive setscrew torque.



**Figure 1.** Cracked ball bearing inner ring

The installation torque rating can be found on respective installation manuals for each Dodge product. The use of a torque wrench is critical to control the torque of the setscrew and ensure the correct force is applied. To ensure proper setscrew performance, thread locking adhesives or lubricants should not be used.

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