Dodge® mounted ball bearings: frequently asked questions

End users and distributors frequently call Application Engineering and Dodge Inside Sales with questions about Dodge ball bearings. What follows are some of the questions that come up often along with the answers to those questions.

Q. What is the standard grease in a standard Dodge ball bearing and with how much is it filled?

A. The standard grease is 35 % filled with Mobil Unirex N2. However, it is important to note that the grease and fill amount are different for other types of ball bearings. The Dodge air baggage handling system ball bearing is 66% filled with Mobil Unirex N2. The Dodge washdown and beverage ball bearings are 100% filled with Mobilgrease FM 222. The Dodge high temperature ball bearing is 35% filled with Dupont Krytox 206. The Extreme Duty bearings are 66% filled with Mobilith SHC PM 220.

Q. Can a different grease than the one supplied by Dodge be used in the ball bearing?

A. Different grease can be used as long as the thickener types of the two greases are compatible. If not compatible, the new grease can interact with the old grease in undesirable ways including becoming too hard or too soft. When this happens, the new grease may not lubricate the bearing properly and the life of the bearing may be shortened. The grease for the standard ball bearing and air baggage handling system ball bearing has a lithium complex thickener, so any other grease used would need to have a lithium or lithium complex thickener. The grease for the washdown and beverage ball bearing and has an aluminum complex thickener, so any other grease used would need to have an aluminum complex thickener.

Q. If a ball bearing is requested to be supplied with a grease that Dodge cannot supply, what are the options?

A. Dodge can supply the bearing without grease upon request. The bearing will be supplied with a rust preventative only. The bearing will be tagged to indicate that it cannot be used until greased by the end user.

Q. How much grease should be added to a Dodge ball bearing?

A. A rule of thumb is to add three shots of grease per inch of shaft diameter. A more reliable approach is to add grease until fresh grease is seen purging from the seal area. This helps ensure that contaminants are purged out of the bearing as well as provide fresh grease to critical areas such as the balls and raceways, but in higher speed applications, this method may increase the operating temperature beyond a reasonable

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level. For exact recommended amounts, you may use the grease calculator tool found in Dodge Passport: https://dodgepassport.abb.com/

Q. Will filling a Dodge ball bearing with grease until it comes out of the seal damage the seal?

A. No. The Dodge lip seal and labyrinth seal allow grease to purge past the seal without incurring any damage.

Q. What amount of grease does Dodge recommend for slow and especially dirty ball bearing applications?

A. The Selection section of the Dodge Bearing Engineering catalog shows the maximum allowable rotation speed based on bearing type, size, and seal. Dodge recommends a 100% grease fill for shaft speeds up to 20% of the maximum allowable speed and for applications that are especially dirty.

Q. What is the temperature range of a standard Dodge ball bearing?

A. -20°F-225°F. However, Dodge offers a high temperature version of the bearing that is rated up to 400°F. With the standard bearing, at temperatures exceeding 225°F, the strength and dimensional stability of the nitrile rubber lip of the seal and the glass reinforced nylon cage will decrease and the seal and cage will no longer function properly. Our high temperature version of the bearing remedies these limiting factors by removing the rubber lip from the seal of the standard bearing and replacing the standard cage with a Maxlife cage.

In terms of internal clearances, the standard C3 clearance isn't sufficient to allow for common radial thermal expansion. Therefore, our high temperature version of the bearing has the more open C4 clearance. In the high temperature version of the bearing, the outer ring is heat stabilized to retain the ideal mechanical properties at higher temperatures.

Lastly, the high temperature version of the bearing is supplied with Dupont Krytox 206 high temperature grease. Below -40°F, the cage in the standard bearing will clamp down on the balls, preventing them from having the proper rolling motion.

Q. What is the maximum allowable speed for a Dodge ball bearing?

A. The Selection section of the Dodge Bearing Engineering catalog shows the maximum allowable rotation speed based on bearing type, size, and seal. Different types of seals have different speed ratings, so if the ball bearing is available with more than one type of seal, the selection section will show the maximum speed for each seal type.

Q. If the end user only has the number that was cast into the ball bearing housing, is it possible to determine the complete bearing part number?

A. If the end user can tell C.O. Engineering the shaft size and type of locking mechanism, the bearing part number can be determined.

Q. Where can a CAD drawing or 3D model be found for a Dodge ball bearing?

A. Go to www.baldor.com, click on Resources and Support, click on Drawings. Follow the instructions to download the CAD Model

Q. How does a Dodge air handling ball bearing differ from a Dodge standard ball bearing?

A. Air handling bearings are all noise tested. The bearings are brought up to a high speed and sound levels are checked at three different frequencies. The air handling bearings cannot exceed certain sound levels. The reason for this is that air handling units are often placed on the roof of buildings and the quieter the bearings are, the less noise there is that gets transmitted into the building.

Air handling bearings have a lower swivel torque than standard ball bearings. Swivel torque is a measure of how much torque is required to swivel the bearing insert when it sits inside the bearing housing. Air handling units and bearings are often mounted on flexible surfaces such as sheet metal. When a bearing is mounted on a rigid surface, it is easy for the insert to swivel as needed within the housing to align itself when the shaft changes angle of entry into the bearing. When a bearing is mounted on a flexible surface, it is harder for the insert to swivel if it has the standard swivel torque. Having a lower swivel torque allows the air handling bearing insert to swivel more easily. If the swivel torque was not reduced, the insert would tend to not swivel in the housing, but instead the entire bearing would swivel when the shaft changes angle of entry into the bearing.

Finally, air handling bearings also have a tighter bore tolerance to reduce eccentricity.

This article has attempted to answer the most common questions about ball bearings that are frequently heard by the Application Engineering group. If there are additional questions that come up, please call Dodge Application Engineering at 864-284-5700