Greasing Bearings − How Much is Enough?

By Thomas Yoon

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Previously, we have talked about using suitable greases for different applications. Basically, we want to use low temperature greases for low temperature applications and high temperature greases for high temperature applications. The reason is quite simple − we want the grease to form a thin film of lubricating oil between the rubbing surfaces.

If we use high temperature grease for normal temperature applications, the chances are the grease will still be in semi−solid state and will not flow to cover the contact surfaces of the moving components during operating conditions.

Assuming you have chosen the correct grease, how do you determine how much you need to put into the bearing?

Excessive grease lubrication can easily cause overheating. The grease gets churned around within the moving parts of the bearing and has nowhere to go. The temperature rises. The grease becomes the wrong temperature selection even though the application is correct.

A general rule to follow is that the bearing should be filled completely but the free space in the housing only partially. This gives room for the grease to be ejected from the bearing on start−up.

However, there is some grease, the so−called "totally−filled" greases like lithium soap greases that can allow filling up to 90% of the free space in the housing, without risk of a temperature

rise. This is because they are special. Their stability at high temperatures is excellent and can be utilized over a wider temperature range than sodium soap greases.

By filling up all the free space, impurities are effectively prevented from entering and damaging the bearings and the lubricating intervals can be extended.

For most other greases, the general rule applies.

Bearings can be divided into two categories − non−separable and separable bearings. No matter which bearing type it is, the general

practice is to fill up the space between inner race, the outer race, and the rolling components (ball or roller) on both sides of the bearing. Because of its consistency, the grease should be able to remain in place without dropping off. In this way, we can ensure that the rubbing contact surface actually has grease on it.

For relubrication, how much is enough? The following formula gives a good indication:

G = 0.005 DB

where,
G = grease quantity in grams
D = bearing outside diameter in mm
B = total bearing width in mm

By practicing proper lubrication, the bearings should be able to last for a long time. However, bearings can still fail if it has not been installed properly or for other reasons.

Until next time...

Thomas Yoon's skill in illustration/writing has enabled him to producenumerous ebooks on engineering subjects that can be downloaded at

Engineering E−books

. He has also produced an ebook

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"50 Secrets of Truth and Life"

that is fully illustrated with cartoons in a humorous way.

How To Assemble a Skateboard?

By Fred Riehl at www.BraveSurf.com

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Things you will need:
1 Skate board deck
1 sheet skate board deck griptape
2 skateboard trucks
4 skateboard wheels
8 skateboard wheel bearings
2 risers
1 set of mounting hardware
1 philips head screwdriver
1 skate tool
1 metal file
1 sharp razorblade

1. First apply the skate board deck grip tape. By unpeeling the backing and then carefully stick the tape evenly on the top surface of the skate deck. File down the grip tape around the edges of the skateboard, and then carefully use the razorblade to slice off the excess grip tape that hangs over the edges on the skatedeck.
2. Next, attach your skate trucks to your skateboard deck. Use one of the screws from the mounting hardware to poke a hole in the griptape. Then push the mounting hardware from the top of the skatedeck to the bottom.
3. Now slide the risers over the hardware. Next slide your skate trucks on. Make sure that the bushings from the trucks point toward each other or face the center of the board. Tighten the nut with the skate tool until it's flush with the trucks. Warning: Do not over tighten; you can cause the wood to split.
4. Now press the bearings into your wheels using the skate tool. Repeat this for all four wheels. If you do not have a skate tool. You can use your axe on the trucks by placing the bearing on the axel and then pressing the wheel into the bearing, causing the bearing to slip into the wheel. Warning: Be very carefull not to dent or pinch the metal seal around the sides of the bearing. This will ruin the bearings and cause them not to spin!
5. Once the bearings are in place, you can put the on the trucks. Do not over tighten this will crush the

bearing causing it not to role.
6. Now the board is ready to skate. You may need to fine tune the trucks to your liking by loosening them or tighten them. The looser the trucks the easier to carve.
7. Once you are done you can always customize your board with some stickers

Remember to skate safe and wear your pads when needed.

Fred Riehl has been surfing and working with Brave New World surf shops for 18 years!The Tube Quest Continues at ... www.bravesurf.com