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TRICYCLE GEAR AIRCRAFT NOSE WHEEL TORQUE

Question:

How do I properly install the bearings and torque the axle nut on MATCO mfg wheels with tapered roller bearings that have the integrated rubber grease seal on the bearing cone?

Answer: MATCO mfg wheels using tapered roller bearings are equipped with Timken bearings utilizing integrated grease seals on the bearing cone to ensure the longest possible life. The torquing procedure for bearings with these type seals is different than for tapered roller bearings without them. A common torquing technique for bearings *without integrated seals* is to tighten the axle nut until the wheel stops spinning freely and then back off to the nearest locking feature. **THIS TECHNIQUE WILL NOT WORK ON A BEARING WITH AN INTEGRATED SEAL.** The reason for a different torquing technique is that the grease seal produces some drag and makes the wheel feel somewhat stiff when rotated. Reducing the axle nut torque until the wheel spins freely will allow the grease seal and the bearing cone to improperly rotate with the wheel (the cone must not rotate relative to the axle). The higher rolling drag is completely normal for this bearing and allows for longer bearing life since the seal will keep most contaminants out. Timken specification state, for example, that the two 1.25 inch tapered roller bearing used on the WE51 will produce between 18-26 inch pounds of torque (drag) when properly installed. A light coating of grease on the seal will help reduce the drag on initial installation. The drag will also reduce after the bearings have been installed and the seal relaxes in the bore. It is important that the axle nut torque be sufficient to keep the seal from rotating with the wheel. With the bearings cleaned, dried, greased, and inserted in the wheel, the axle nut should be tightened until all play is out of the assembly. Rotate the wheel back and forth while tightening the nut to help seat the bearings. When all play is out of the assembly, and the wheel rotates freely, tighten to the next castle slot and insert the cotter pin. The rubber seal on the tapered roller bearing will remain stationary while the wheel rotates around it. If the seal is spinning on the axle, the nut should be tightened further until the seal stops spinning with the wheel.

Nose wheels on Van's Aircraft tricycle gear aircraft use Matco wheels and bearings with integrated rubber seals. It has been our determination that the "Minimum" torque that can be used to ensure that the wheel bearing outer cone and seal does not move is 7 ft-lbs. Our "Maximum" torque recommendation is 16 ft-lbs. This value is based on the standard bolt torque for the AN6 bolt used as the nose gear axle on all models.