

## McKINNEY BEARINGS

We utilize 3 different bearings in our hinges. Oil impregnated bearings (TA / T4A) on our 5-Knuckle hinges and 2-Knuckle a polymer anti-friction bearing called Zytel on our 3 knuckle hinges and concealed bearing 5-knuckle (TCA). Of course, the old style ball bearing is still available as an option on 5-knuckle hinges. Following is information regarding TA Vs TB bearings on 5-knuckle hinges. This information will explain why the TA is our standard on 5-knuckle hinges. All of the bearings we use qualify as anti-friction bearings under ANSI A156.1-2000, which also allows us to meet the requirements of NFPA80 (National Fire Protection Association).

On 5-Knuckle hinges, the knuckles on the 2er leaf carry the lateral load where they contact the hinge pin. The pin is fixed (or tight) in the 3er leaf and the 2er leaf rotates around it. The greatest force exerted on hinges by the door is the vertical load. This load is carried by the joint(s) between the knuckles. When bearings are used, they are expected to ease the job of carrying that load. In order for the bearing to perform that function, the dimensions that the knuckles are manufactured to are controlled so that the joint that has the bearing carries the load. All other joints have a small amount of clearance so that they do not contact each other, thereby allowing the bearing to do its job without added friction from other joints. The specific joint where the bearing is located is not relevant to its ability to carry the weight of the door. At one time, all of the major hinge manufacturers made their 5-Knuckle standard weight hinges with the bearings located "inboard" Some of the manufacturers use a mounting method for their bearings which was difficult to machine for and to assemble in the "inboard" position. When they realized that it would be easier for them to do this work at the "outboard" position, they changed to that location, purely for the ease of manufacturing. McKinney did not choose to follow that path, just because the others did. Our methods of manufacture did not require it and the expense in machinery and tooling changeovers would have been cost prohibitive

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The following is information regarding "TA" versus "TB" bearings.

Ball bearings (TB) which have been used for years in all industries are constructed with 2 races, a cover and a specified number of balls in the races, then packed with grease.

The oil-impregnated (TA) bearing so widely used now days may not be familiar to you. Powdered bronze, under heat and pressure, is formed into the desired shape and this porous part is then impregnated with oil. It accepts and holds the oil by capillary action, just like a sponge. When something (a hinge knuckle or pin) moves against it, the oil comes to that surface and lubricates the points of friction. One of the greatest advantages in using oil-impregnated bearings is that they are less likely to be affected by adverse conditions such as dust or sand.

Second, the original oil is considered to be a lifetime lubricant and such a bearing is ideal in situations where lubrication maintenance is difficult or uncertain. If it ever did have to be re-oiled simply pull the pin, separate the leaves and apply oil to any exposed point on the bearing. The capillary action will pull the oil throughout the bearing. Compare this with trying to repack grease - **NOT OIL** - in a ball bearing assembly.

The top hinge generally carries the bulk of the load and if its a two bearing hinge only one bearing is working. Since an oil-impregnated bearing has the ability to "wear in," soon the middle, and then all three hinges, will be doing their share and the wear from this point will be almost non-existent.

Conversely, ball bearings with their hardened steel or stainless steel balls and races do not have this advantage and so the load continues to ride on the tangent points where the balls contact the races and, primarily, on that one ball bearing assembly of the top hinge. Occasionally, this proves insufficient and as the races turn within the jacket they score and ultimately cut through it, allowing the balls to burst out, causing the door to drag on the threshold.

Oil-impregnated bearings are the best type for use in hinges for they are intended for moderate speed, heavy load situations. However, we will continue to produce both types of bearings to meet the requirements of all our customers. *(This information is available in letterform, just refer to the TA/TB letter)*