FOX-TRACKS

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Belt Drive Applications
When using a motor on a belt drive application the proper belt alignment and tension is necessary to provide adequate torque, and reduce wear on belts, pulleys, and bearings.

If the belt is too loose it will slip, and not provide the desired torque (see case summary below). If it is too tight it can cause premature damage to the belt, the pulleys, and/or even the motor and driven equipment.

Case Summary: A motor which drives a compressor was brought to our shop. The complaint was that the compressor would run fine until it reached a certain pressure and the pressure wouldn't build up past that point. The pressure was well below the shut off pressure for the compressor. The compressor was taken to a repair facility where they replaced the pressure switch, the check valve, and the power cord which did not solve the problem. The service center told the customer that they had a "bad" motor, so they removed the motor and brought it to us.

After thoroughly checking the motor, we could find nothing wrong with it. The customer brought us the compressor so we could get the whole picture. (We like being able to get the whole picture. In most cases it makes troubleshooting a lot easier.) After mounting the motor on the compressor we discovered that we couldn't tighten the belt. The adjustment was at its outermost point, and the belt was worn out. We ran the unit like this, and sure enough, the compressor wouldn't build up to its rated pressure and the motor just kept running (at less than nameplate amps). After replacing the belt, and properly adjusting the tension, the compressor worked as it was designed to work.

On the other end of the spectrum, if the belt tension is too tight, it can cause damage to the internal components of the motor and the driven equipment. Not to mention premature failure of the belt(s) and pulleys. We have had countless cases of premature bearing failures in motors which were caused by over-tightening of belts. In most cases, the rear bearing in the motor will fail and the rotor will begin dragging the iron inside the motor core, which results in a blown winding. When this occurs, we usually wind up with an un-repairable motor.

Alignment of pulleys may not be as critical as alignment of couplings, but properly aligned pulleys will increase the life of belts and pulleys. For most installations, a simple straight edge that will reach across the faces of both pulleys, will provide an adequate tool for alignment. Remember To allow for possible differences in pulley wall thicknesses. If more precision is required, there are many varieties of alignment equipment available.

The following are websites with more information that may be helpful. We are not endorsing these products. They are for reference only.

http://www.maskapulleys.com/images/produit/belt_tensioning.pdf

http://www.reliabilitydirect.com/alignmentproducts/SKF-TMEB2.htm