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Proper Care and Tensioning of Belts on Concrete Saws

By Marty Marsic

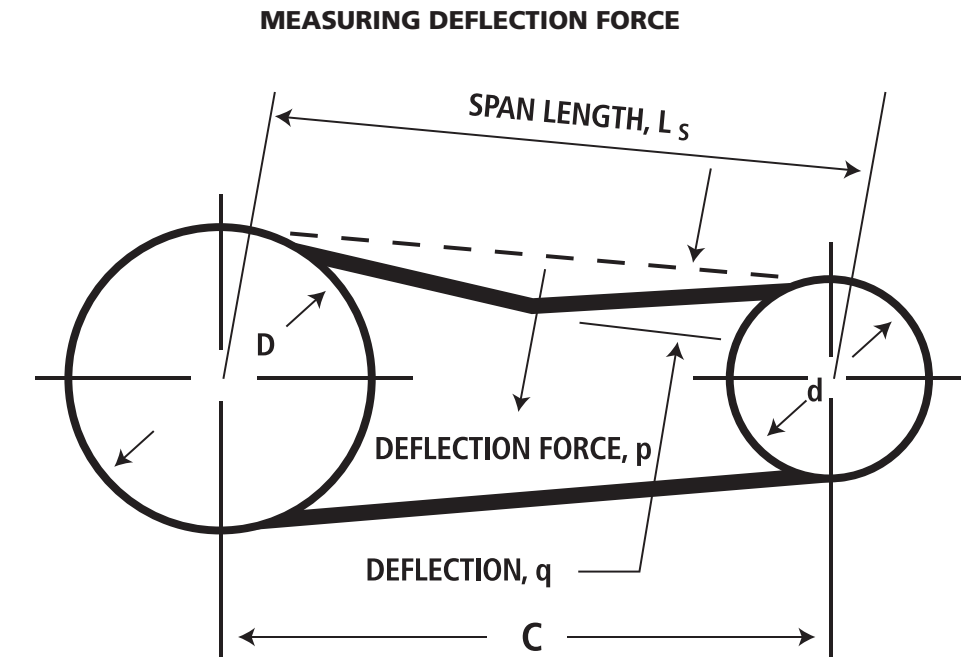
The majority of concrete saws that are being used today rely on a belt to drive the blade shaft. The belt is a very convenient and efficient means of transmitting the power and motion needed to turn blades. Belts also serve as the fuse in the system. They are designed to slip, preventing overloading and damage to other components in the drive system. The goal is to adjust the belt tension so that the belt transmits the maximum amount of power without overloading the drive system. The practice of overtensioning belts can result in failed shafts or bearings.

BELT TYPES

There are many types of belts. This article will focus on V-belts, as these are the types of belts predominantly used on concrete saws. Not all belts are the same, and can differ greatly in their design and performance. Use only high quality belts from reputable manufacturers.

BELT CARE

To maximize the performance and longevity of belts, keep them free of foreign objects or substances. Make sure that the saw is adjusted properly to prevent the belts from making contact with stones and debris as well as the ground. This will cause damage to belts resulting in premature failure. Avoid getting



grease and oils on the belts. This will cause slippage that will result in poor performance and overheating. If a belt has slipped too much it will start to smoke. Let the belt cool and it will recover. Continue to run the saw, but without load.

THE IMPORTANCE OF MATCHED BELTS

Due to inconsistencies in belt manufacturing, belts naturally have tolerances on their length. The variation in belt length can be more than 0.75 inches on belts shorter than 60 inches. On higher quality original equipment manufacturer (OEM) belts, this varia-

tion is less than 0.03 inches. It would be very difficult to achieve proper tension on 10 or 20 belts that have any variation in length, as applying the same amount of tension to each would result in shorter belts taking more load than the longer ones, providing poor performance and premature failure. Matched OEM belts arrive from the factory pre-sorted to the same length. This makes it easier to properly tension the belts, resulting in longer life and better, more consistent performance.

BELT TENSION

Proper belt installation tension is essential in V-belt drives to achieve optimum performance and reliability. The correct installation tension for a belt, or a set of belts, depends on the drive geometry and load conditions. The equipment manufacturer can provide the design tension of the belt drive for a particular piece of equipment. The belt tension has been properly calculated to maximize equipment performance. Squealing belts are a sign that they are not sufficiently tensioned. New belts need to be tensioned again shortly after initial use. At the factory, new belts are installed on new saws, then run under high load on a dynamometer. The belts are then tensioned one more time before being deemed fit for use. It is common that belts will need to be tensioned again after a few hours of field use and then periodically thereafter.

Special care should be taken to tension and load the belts evenly. The opposing sheaves must be kept as parallel as possible in order to achieve optimal performance. When the sheaves are parallel, the distance on either edge of the sheave to the opposing sheave will be the same. When sheaves are not paral-



lel, the belts will be unevenly loaded and will result in poor performance and short life. On a multi-belt setup, it is imperative to have very similar belt tension for all of the belts. This ensures that the maximum amount of power can be transmitted.

SAFETY FIRST

Never wear loose fitting clothing while working around drive systems. Before working on any machine, make sure that the machine is turned off and is properly locked out. Make sure that any guarding that needs to be removed to inspect drive systems is properly reinstalled afterwards.

MEASURING BELT TENSION

Belt tensioning is usually accomplished by increasing the center distance between the sheaves.

Belt tension can be measured by mechanically deflecting the belts. Mechanical tension meters are available from many belt suppliers. Tension is measured by pushing on the belts with the mechanical tension tester, and belt tension can be adjusted until the proper load/deflection ratio is achieved.

The most accurate and consistent means of measuring belt tension is with a sonic tension meter. A sonic tension meter is an electronic instrument that measures the oscillations of a belt before calculating the belt frequency and belt tension. To measure the belt tension with a sonic tension meter, simply hold the microphone near to the belt and pluck at the belt. The meter will then display the belt tension.

In order to achieve the absolute best performance and longest life span for a belt, it must be properly maintained and the saw must only be run with the belt at the correct tension. Failure to do either of these things can result in failure of the belt, the equipment or possible injury to the operator.

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