



High duty cycles; breaking the 30 minute/hour barrier.

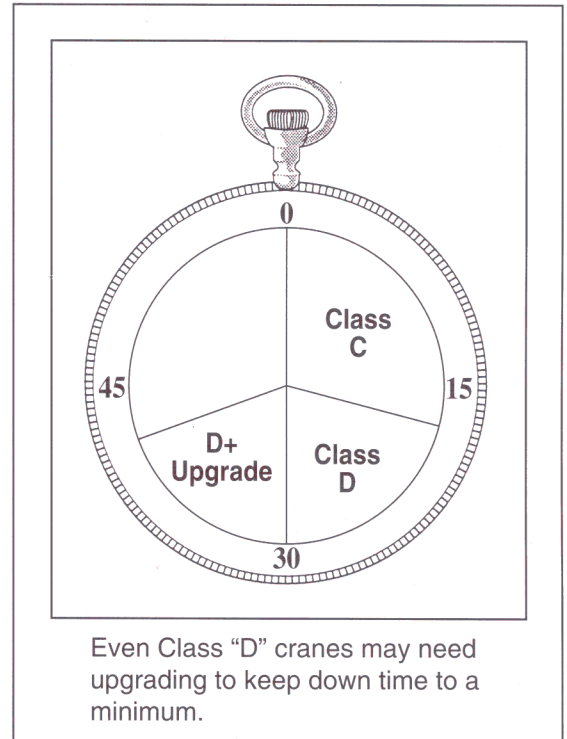
Even Class “D” cranes are designed for only 30 minutes/hour on time. The “D+” upgrade can allow 45 minutes/hour capabilities.

The 30 Minute Limitation

The motors, drives, and controls on Class “C” and Class “D” cranes are designed for 30 minutes of on time per hour. A Class “D” crane is designed to last many years longer with less maintenance, but not to be used more during a given hour of operation. When an application requires 40-45 minutes on-time/hour, a customer typically buys a Class “D” crane and performs a great deal of maintenance. The “D+” upgrade is a better, more cost effective alternative.

Understanding the Constraints

Motor on-time is defined as the period of time during which a motor is *actually running*. This means the hoist is actually lifting/lowering or the crane is actually travelling. When the hoist is holding a load, but not lifting/lowering, this is rest time, not running time. Also running time is not the combination of several motor on times.



Understanding the Problems and the Solutions to Running a Crane more than 30 Minutes/Hour

	PROBLEM	D+ UPGRADE SOLUTION
Motors	The motor builds up excessive heat, and eventually burns out. Standard motors require 30 minutes/hour rest time to cool off.	<ul style="list-style-type: none"> A 60 minute rated motor is used. These motors are designed to withstand heat buildup and do not need cooling off time.
Gear Boxes	The friction between gears in the hoist, bridge, or trolley gearboxes generate heat. This is especially true of the hoist gear train due to the mechanical load brake that is a standard safety feature of American made hoists. This heat causes the gearbox oil to break down, and in turn the gears to wear quickly.	<ul style="list-style-type: none"> A cooling fan is mounted outside the gearbox to forcefully blow cool air onto the gear case and dissipate the heat. Synthetic premium grade oil is used. This oil is designed not to breakdown until 400°F, which is 200% greater than standard oil.
Contactors wear and tear	Old fashioned electro-mechanical contactors pose 3 problems for the high duty cycle crane: 1) When the motor is started often and quickly (jogging), a non-conductive surface starts to build on the tips 2) The sparking which occurs during “starting”, pits and flakes the tips, and 3) The mechanical moving parts wear out.	<ul style="list-style-type: none"> Contactors are replaced with a silicon chip based modern variable frequency inverter. It has no moving parts to wear, it has no sparking and most importantly it provides soft start, soft stop, and infinitely variable speeds, which provides so much control, jogging is eliminated. “D+” invertors are designed for continuous use, with zero maintenance.
Mechanical Failure	Moving mechanical parts, such as wheels and gears, can wear out prematurely due to very high levels of use. Even though Class “D” sized parts last much longer than Class “C” parts, even more life is available with a “D+” upgrade.	<ul style="list-style-type: none"> Wheels, gears, and pinions, can be heat treated, or made of more rugged alloys. Gearboxes can be sized for 33% additional capacity, to provide a longer useful life.