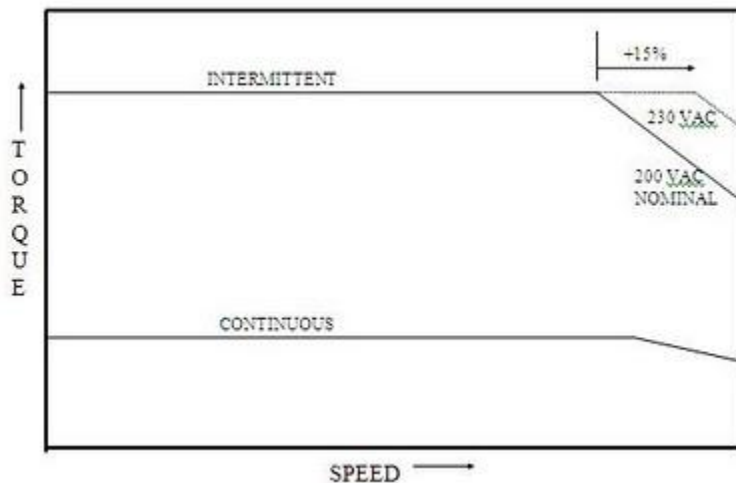


## X-Series Driver Speed Torque Relationships

### Line Voltage and the Toshiba Machine X-Series: Keep on Torquin'

Can you imagine plugging a device into a wall outlet and not knowing how well it'll operate, or if it will work at all? For most of our customers, this situation probably sounds like a relic of a bygone era, but in many developing countries, it's a fact of everyday life. While voltage fluctuations may be just a minor annoyance in some situations, like watching television, they can be downright dangerous in large-scale mechanical and production processes. Besides safety, there are also the usual concerns about machine efficiency and downtime.



IIS's Toshiba Machine X-Series driver speed torque curves, shown at right, neatly illustrate servo motor operation in a perfect world. The driver generates torque action as a result of the difference between motor voltage and driver voltage, or incoming line voltage. Torque remains constant as the motor's speed increases, until the critical roll-off event occurs when the motor's voltage reaches that of the driver (higher speeds increase energy and voltage within the motor).

As you can see, the intermittent torque drop is much earlier and steeper with the lower 200 VAC input – but with a consistent, reliable voltage source, it can be accounted for. In situations and locations where the line voltage is unstable, the roll-off can occur at any time, and this curve illustration goes in the trash – as might defective components produced or machinery damaged as a result of this unpredictable functioning. We at IIS are pleased to answer any questions our international or domestic customers might have about this problem. Our simplest suggestion? Consider moving up a motor size rating to ensure that applications run properly, even if line voltage dips.