Motion Control Editorial – Brakes & Clutches

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Is it feasible to expect regenerative braking to have a larger role in industrial automation as it becomes more efficient? Why/why not?
With the advent of AC technology, I increasingly see regenerative braking becoming commonplace in the industrial automation marketplace. Electrical power can be had by back-driving AC motors, which basically become generators thereby offering mechanical braking and regenerative electrical energy. With respect to electromechanical clutches and brake, this emerging technology will open up new applications for spring set brakes which will be used for holding / emergency brakes as a complement to the AC motor.

What is the best way to monitor mechanical clutch disengagement?
The obvious way is with the result, movement/non-movement of the drive member; but there are also many other ways of electronic monitoring such as proximity sensors (encoders, resolvers, linear sensors etc.), or if the clutch/brake is electromechanical one can monitor the transient effect in the current signal.

Why would you specify a mechanical clutch over a hydraulic or pneumatic clutch?
There is a market for all three devices, and the decision to use one over another flows from the specific needs of the customer's application (i.e. torque range). But in general there is a great advantage to using a mechanical clutch/brake over hydraulic or pneumatic in that all the ancillary fluid/air lines, seals, tanks etc. can be eliminated if the customer utilizes a mechanical-only device.

Given the mechanical clutches limited range of torque, in what applications would specifying it be most suitable?
There are a multitude of market segments where mechanical clutches are used, including material handling, packaging, medical, automotive, defense, office automation, agricultural, etc. Applications include: bagging, cutting, stapling, wire bending, conveyor, patient table, X-Ray, power sliding doors/lift-gates, transfer cases, gun turrets, copiers, printers, seeding, combines, etc.

What three things should be top of mind when I am specifying a mechanical clutch?

1. Speed (RPM) of the application
2. Minimum torque requirement
3. Space availability