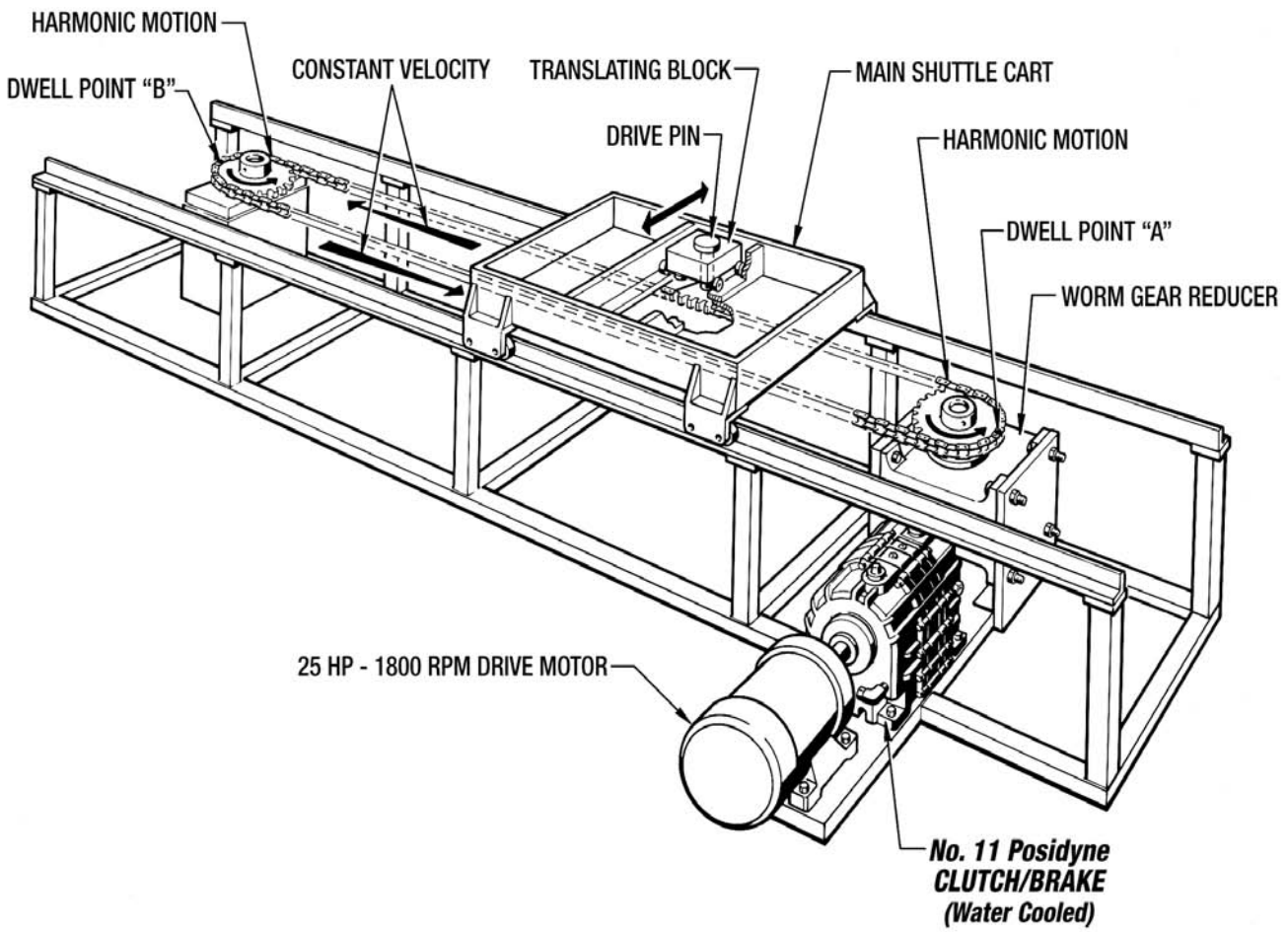
APPLICATION BULLETIN

APPLICATION: **Long Stroke Shuttle Drive**

INDUSTRY: **Automotive and Packaging Industry**

PRODUCT: **Oil Shear *Posidyne* Clutch/Brake**

LONG STROKE SHUTTLE DRIVE



LONG STROKE SHUTTLE DRIVE

DRIVE REQUIREMENT: The clutch brake is to provide a cycle on demand control function incorporated in the design of a unique shuttle transfer mechanism. The purpose being to provide controllable starting and accurate stopping of a long stroke shuttle.

APPROACH: A constant speed 25 HP at 1800 RPM AC motor is used to drive a No. 07S Water Cooled ***Posidyne*** Clutch/Brake. The ***Posidyne*** is direct coupled to the input shaft of a standard worm gear reducer having output shaft extended up. The drive assembly is positioned so that the reducer output shaft is centered between the main shuttle tracts. At a distance of 14 feet down the center line of the track, a jackshaft is mounted vertically and identical roller chain sprockets are mounted both on the reducer shaft and jack shaft. A length of roller chain connects the sprockets and is held together by a special connecting block which is machined in such a manner that it can pass around the sprockets as the chain moves and has a vertical stud which is used as the shuttle cart drive pin. Inside the cart is a miniature shuttle block that captures the drive pin and, by moving side to side, requires the shuttle cart to follow the pin as it goes around the chain path.

SEQUENCE: The ***Posidyne*** brake holds the worm gear reducer with the connecting block at dwell point "A" while the shuttle cart is loaded. Upon completion of loading a limit or sensor is satisfied signaling the ***Posidyne*** to engage the clutch. The first 90° of rotation of the reducer sprocket results in a harmonic acceleration of the shuttle cart. As the connecting block passes along the straight section of the chain it moves the shuttle cart at constant velocity. As the connecting block enters the other sprocket and begins its movement around the sprocket a harmonic deceleration of the main shuttle cart occurs. As the connecting block approaches dwell point "B" the ***Posidyne*** is signaled to engage the brake, stopping the motion, and allows the main shuttle cart to be unloaded. When the cart is unloaded the ***Posidyne*** is signaled to engage the clutch, which in turn drives the mechanism to the same harmonic constant velocity-harmonic motion, but in reverse direction. The drive is stopped with the connecting block back at dwell point "A", and the cycle is complete.

FEATURES:

- Trouble shooting of this type of long stroke shuttle design is extremely simple when compared to complex hydraulic systems. Any problems that might occur can be seen physically and are not hidden within valves, cylinders or pumps.
- Flexibility of speeds and stroke lengths are unlimited.
- The simple harmonic acceleration and decelleration eliminates the high shock loading imposed by other systems.

FORCE CONTROL INDUSTRIES, INC.

3660 Dixie Highway Fairfield, Ohio 45014
Phone: 513-868-0900 *Fax:* 513-868-2105
E-Mail: info@forcecontrol.com *Web:* www.forcecontrol.com