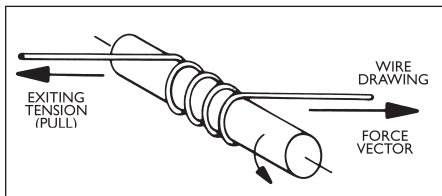


How an RMG In-Line Wire Drawer Works

The operation of a capstan-type in-line wire drawer is dependent on one thing: **traction**. The force required to pull the wire through the drawing die is imparted to the wire by traction on the capstan and the machine's ability to provide this traction is dependent upon several factors.

The principle involved with developing traction is that of a spring clutch a coil spring around a rotating shaft. When the exiting end of a spring is pulled, its inside diameter decreases and comes in contact with the rotating shaft.



The ensuing traction transmits torque from the shaft to the spring which rotates along with the shaft. Increasing the number of loops of wire wrapped around the capstan, or increasing the diameter of the capstan improves the traction. Also, increasing the exiting tension of the wire as it leaves the capstan, increases the traction.

If the exiting tension is not sufficient to keep the wire tightly wrapped around the drum, traction will be lost. This is why the relationship of the wire diameter and the capstan diameter is important. Large-diameter and/or high-tensile wire resists bending and tends to spring away from the drum. Small diameter and/or low-tensile wire clings more easily around the capstan's surface.

Capstan Traction with a Wire Relaxer

The Wire Relaxer, a grooved one-way clutched roller, is used to continuously clamp the the last loop securely against the capstan and prevent the wire from springing away. Therefore, with a given capstan diameter, greater traction can be developed allowing heavier drafts or larger wire sizes. Additionally, the Wire Relaxer serves to reduce the exiting tension, resulting in the following benefits:

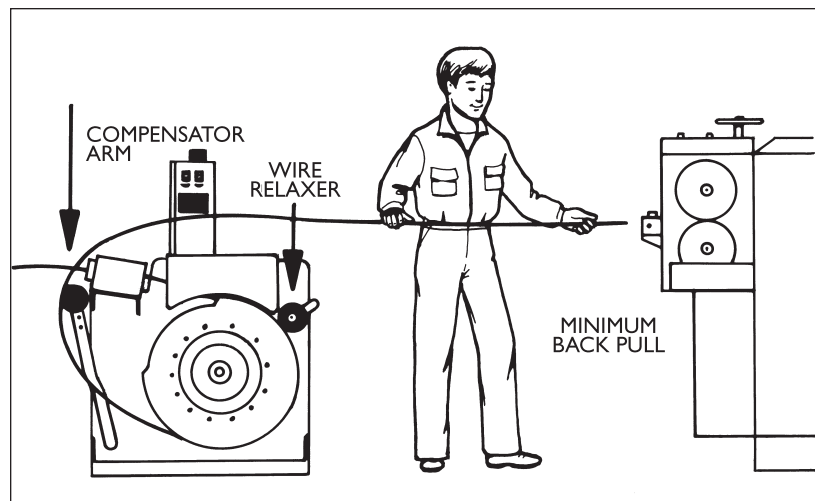
1. Safe removal of the gripper chain during set-up.
2. The amount of pressure applied to the compensator arm can be reduced, which prevents wire kinking.
3. With reduced compensator arm pressure and with reduced exiting tension, short feeds on the production machine are virtually eliminated.

Capstan Traction and the Compensator Arm

Since almost all wire production machines (cold headers, bolt makers, multi-slide units, and straightening and cutting machines) consume wire intermittently, using a feed-and-dwell cycle, a buffer must be provided during the dwell portion of the cycle. If this is not done, exiting tension will be lost resulting in a loss of traction.

The compensator arm functions primarily to:

1. Provide loop storage so that the production machine can feed-and dwell while the wire drawer operates continuously.
2. Maintain just the right amount of pull or exiting tension to insure proper traction with *minimal wire slippage*.
3. Using AUTODRAW[®], RMG's unique Automatic Speed Trim Control system, it automatically increases or decreases the speed of the wire drawer so that it exactly matches the speed of the production machine.



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