Dayton Superior Products
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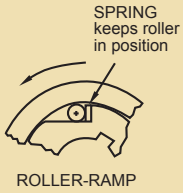
One Way Clutch Types and Applications

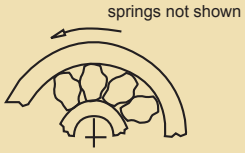
Over-running clutches are also known as freewheeling or one-way clutches. The two types usually used in machinery are the sprag type and the roller-ramp type. The principle underlying the operation of both types is the wedging of an engaging element between an inner and an outer member. The figures show that as the outer race moves in the direction shown, the engaging element, be it roller or sprag, is caused to wedge between the members. The torque capacity is normally limited only by the contact stresses between the parts.



ROLLER-RAMP

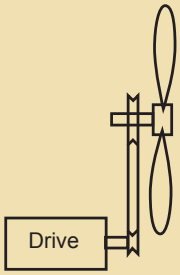
The heaviest duty, most sophisticated and most expensive type is the sprag clutch. It has high ultimate torque capacity mainly because a large number of engaging elements are possible. Frequently, however, the torque rating of a sprag clutch is greater than the torsional strength of its maximum bore shaft. Often when the shaft size is determined by other factors such as beam loading, vibration, deflection, etc., the resulting sprag clutch is much too big.

Our roller ramp clutch was designed to compete in the applications involving the huskier shafts. A sissy by no means, our usual four roller clutch balances the contact stresses between the roller and the ramp with the torsional shearing stresses in the shaft. This results in an easy to produce and simple device, which can really save our customers money in the majority of one-way clutch applications.

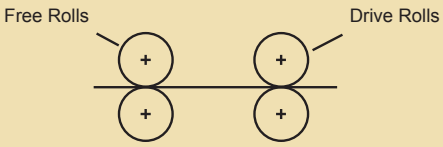


SPRAG

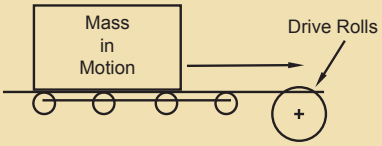
To Protect Equipment and Material



One-way clutch allows kinetic energy in fan to bypass drive during stop



One-way clutches allow thin material to accelerate without stress.



To avoid shock when coasting mass reaches roll at higher velocity, provide a one-way clutch so drive roll free-wheels.

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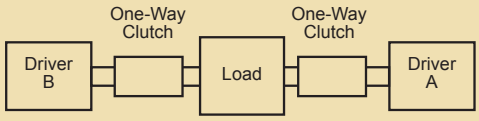
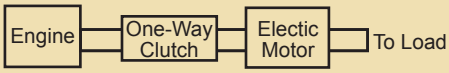
One Way Clutch Types and Applications

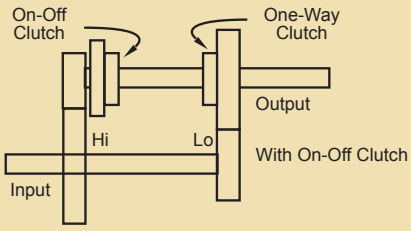
To Select Speed or Power Source

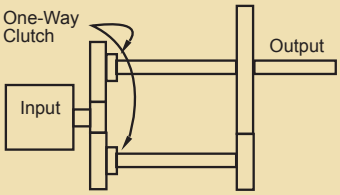


Two types of standby drives: the one with two clutches is also a two speed drive.



With on-off clutch disengaged power is transmitted at low speed thru the low mesh. With on-off clutches engaged power passes thru high speed mesh, overrunning the one-way clutch.

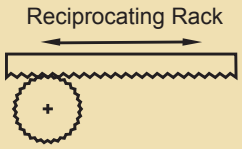


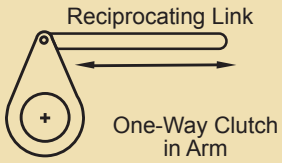


Input reverses to change speed of output. Direction of output remains the same.

To Produce or Alter Motion

Rotary actuation results when one-way clutches are applied as shown. Diagrams show single operators but two or more could be used to smooth out the drive. Often one clutch is arranged to transfer motion and another to hold back during return stroke.





To Prevent Motion

To prevent reversing of load when input torque is absent the drive is connected to frame thru a one-way clutch. Thus the clutch is a backstop or holdback.