

# Clutch Functions and Applications

All Formsprag/Stieber clutches described in this catalog are “overrunning” clutches, i.e., they will drive in one direction but overrun (freewheel) in the other direction. The preparation of a catalog such as this can be undertaken only by a company having very broad experience in all aspects of the use and application of overrunning clutches.

Formsprag/Stieber is such a company, and the information given in this catalog

is based on the accumulation of many years of experience in the design, construction and application of overrunning clutches. In physical appearance, the Formsprag/Stieber catalog overrunning clutches are all very much alike. However, different types of applications will involve differing load characteristics and will call for variations in the technical details of clutch construction. For this reason the clutches

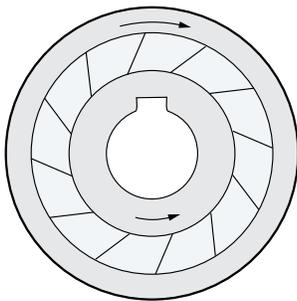
are divided into three basic types of applications for which they are intended.

The three basic applications are:

- **Overrunning**
- **Indexing**
- **Holdbacks or Backstops**

These three categories are described in greater detail under those headings in this catalog.

## Overrunning clutch



This class of applications is typified by standby and compound drives. For example, a steam turbine and a standby electric motor may be connected to a single driven shaft through overrunning clutches. The shaft can then be driven by either the turbine or the motor or both with no further modification of the installation. The turbine drive clutch automatically engages when the turbine starts to drive, but automatically overruns when the load is transferred to the electric motor.

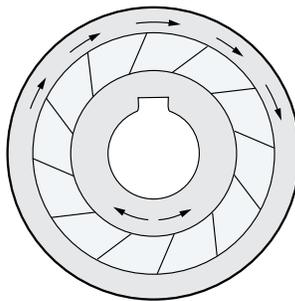
### Considerations

- Type of motor
- Max starting torque
- Internal combustion engines, please consult Formsprag
- Nominal driving torque
- Range of driving speed
- Inertia ( $WR^2$ ) of the driven masses
- Range of overrunning speed
- Number of starts during service life
- Shaft diameter

### Applications

- Dual motor/engine drives
- Conveyor belts
- Creep and starter drives
- Disengagement of centrifugal masses

## Indexing clutch



In this type of application, reciprocating motion applied to the driving race is transformed into intermittent motion in only one direction at the driven race. For example, if a pinion is connected to the driving race, a rack meshing with the pinion can give reciprocating motion to the driving race. The clutch will then advance or “index” the work (driven race) on each forward stroke of the rack, but will not return or back-up on the return stroke of the rack.

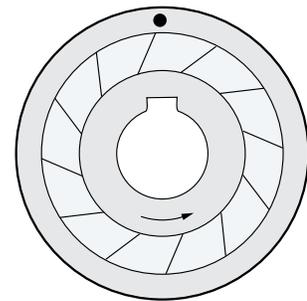
### Considerations

- Number of cycles/min
- Index angle
- Nominal torque
- Inertia ( $WR^2$ ) of the driven masses
- Accelerations of the driving member
- Number of indexes during service life
- Shaft diameter

### Applications

- Metal stamping
- Pressworking
- Packing machines
- Indexing tables
- Assembling machines
- Printing machines

## Backstopping clutch



In backstopping or holdback\* applications, one race is always fixed to a stationary ground member. The function of the clutch is to permit rotation of the mechanism, connected to the other race, in one direction only, and to prevent any rotation in the reverse direction at all times. Although the clutch normally overruns most of the time, it is referred to as a holdback or backstop in conveyors, gear reducers and similar equipment because its function is to prevent reverse rotation.

*\*“Holdback” is a name given to a backstop clutch when mounted on an inclined conveyor head shaft.*

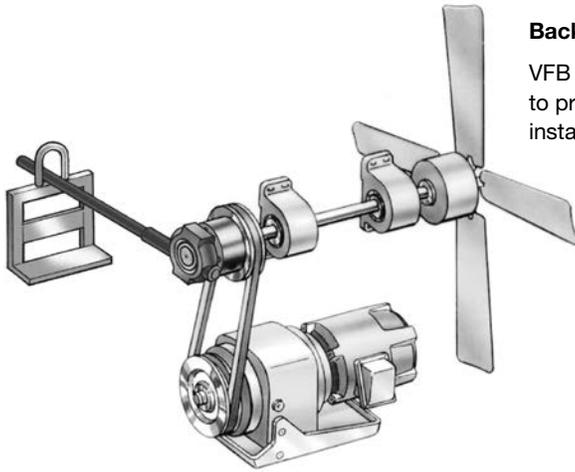
### Considerations

- Motor breakdown torque
- Maximum dynamic reverse torque due to elasticity of the locked parts: elastic belts, shafts of more than 9 feet (3 meters) long
- Range of overrunning speed
- Number of torque applications during service life
- Shaft diameter

### Applications

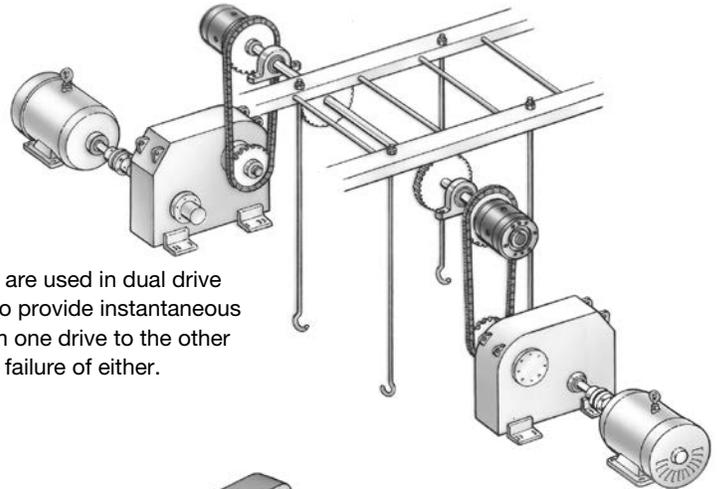
- Inclined conveyors
- Escalators
- Pumps
- Gear drives
- Fans

# Clutch Functions and Applications



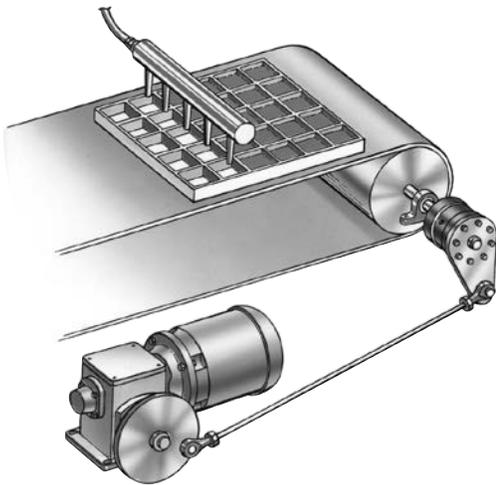
## Backstopping

VFB & HFB models provide automatic backstopping for fans to prevent wind milling when the fan is turned off, actuates instantaneously to prevent any reverse rotation.



## Dual Drive

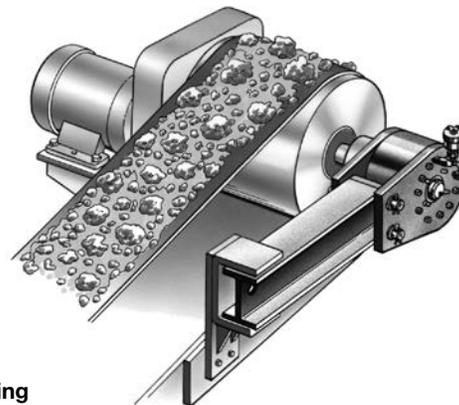
FSO clutches are used in dual drive applications to provide instantaneous clutching from one drive to the other in case of the failure of either.



## Indexing

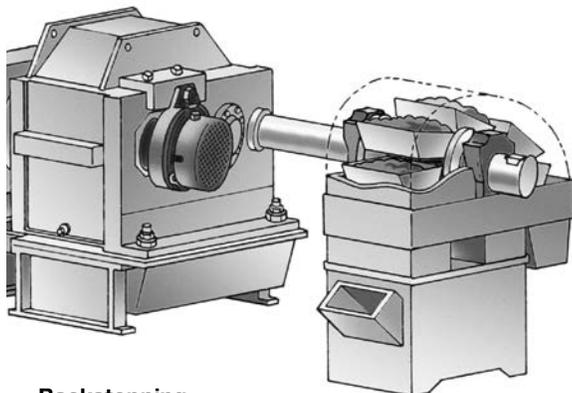
Indexing clutches are used to convert reciprocating linear motion to incremental rotary motion for conveyor or material feed applications.

**Clutch Models:** HPI, AL



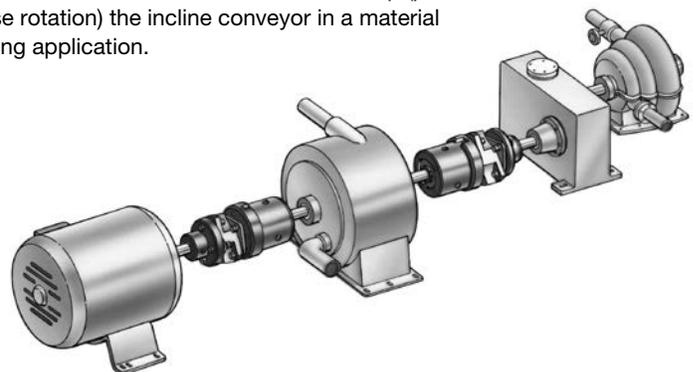
## Backstopping

The LLH Holdback clutch is used to backstop (prevent reverse rotation) the incline conveyor in a material handling application.



## Backstopping

FHB backstops are mounted on the double extended input shaft of gear reducers and provide instantaneous automatic backstopping to the drive system for typically inclined conveyors and bucket elevator applications.



## Clutch-Couplings

Clutch Couplings are used for dual drive of a pump or fan, and when there is a need to connect inline shafts. The clutch coupling prevents backdriving of the other drive source when operating at motor speeds. Clutch couplings allow for the transition from one drive source to another without controls.

**Clutch Models:** FW, FWW, ALKMS, RIZEL,AL..KMSD2, RIZ..ELG2