

## WEST RIVER CONVEYORS | BEHIND THE STEEL SERIES #7

**Alignment-Free Belt Drives** are made from heavy-duty structural steel and available in any belt width and horsepower, depending upon customer specifications. This drive assembly is designed to deliver very high torque and power while being easy to install and maintain in harsh underground mining environments. It's called "alignment-free" because no alignment of the motor, reducer, and coupling assemblies, is needed. Its design drastically reduces installation time, improves reliability, and minimizes downtime in environments where alignment access is difficult or hazardous.

### PULLEYS + BEARINGS

This unit is constructed with two flat-face, mine-duty pulleys with MSHA-approved ceramic lagging. Ceramic lagging, used for larger torque conveyors, allows for bi-directional pulley rotation, helps shed water from the belt, and prevents belt slippage. Both pulleys are equipped with shafts turned down through the bearing journals and fitted with 4-bolt, split-house bearings.

### REDUCER

A reducer, specifically designed for the mining industry, offers versatility for different mounting positions. With a 'flippable' housing and horizontal split line, it's the ideal solution for alignment-free drive packages. This unit includes three reducers with high speed shaft fans and lanterns for high speed couplings.

### LOW SPEED COUPLING

A low speed coupling connects the low speed shaft of a gearbox and the head shaft of a conveyor pulley. When sized properly, it carries the application torque and weight of the gearbox. This rigid coupling consists of male and female hubs in a bolt-together design that is user-friendly for the operator.

### MOTOR

This drive is equipped with three 500HP inverter-duty constant torque motors designed specifically for use with a Variable Frequency Drive (VFD) starter. This totally enclosed fan-controlled motor is 480VAC with 1800RPM.

### DRIVE FRAME

The **drive frame 1**, built from heavy-duty steel, is made to withstand the most demanding underground and above-ground bulk material handling operations. This unit is equipped with heavy-duty **torque arm mounting assemblies 2**, heavy-duty detachable low speed coupling guards, and extended shaft guards for safety. A **16" structural steel beam 3** provides clearance from the top of the ground to the bottom of the drive frame for ease of clean up.

### MOTOR ELECTRICAL BOX

The motor electrical box added to this unit is ready to plug into a power center. It's controlled by a sophisticated triple 500HP AC belt controller. The VFD starter used with this conveyor was made specifically for use with three 500HP AC inverter duty motors.

### HIGH SPEED COUPLING

This drive is equipped with high-speed couplings. This type of closed coupling has tapered grid style hubs, grids, and covers that are interchangeable with other industry standard tapered grid couplings. The vertically or horizontally split cover allows for grid replacement without movement of the connected equipment.



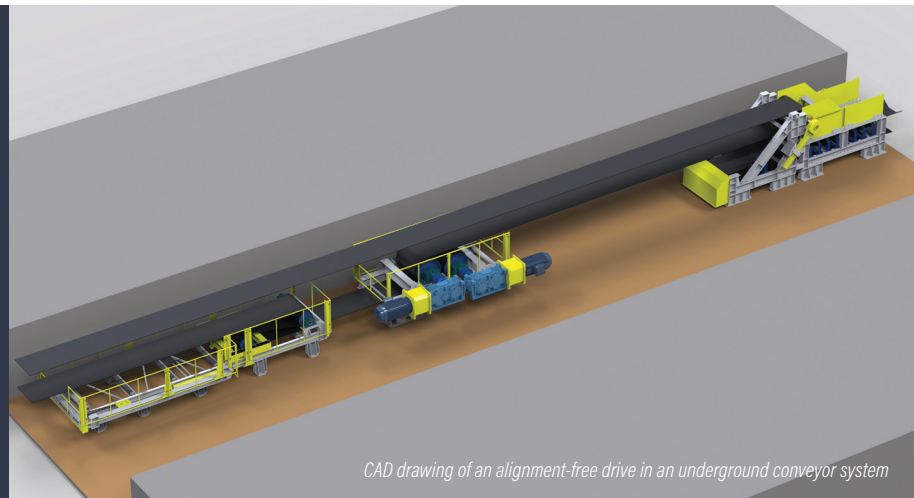
*Alignment-Free Belt Drive  
underground roof/"back" mount setup*

## Key Differences:

FEATURE	ALIGNMENT FREE DRIVE	TRADITIONAL DRIVE
<b>ALIGNMENT</b>	Uses a parallel power base setup that maintains perfect alignment between components, eliminating the need to align the conveyor	Requires precise shaft alignment between the motor, reducer, and pulley — time consuming and difficult underground
<b>INSTALLATION TIME</b>	Rapid installation with no need for field alignment	Time-consuming installation requiring manual alignment and laser alignment tools
<b>MAINTENANCE</b>	Minimal — fewer coupling and bearing issues	High — frequent realignment needed due to vibration and base shifting
<b>APPLICATION SUITABILITY</b>	Ideal for high-horsepower, multi-motor, or difficult-to-access installations (e.g., underground mines)	Suitable for smaller conveyors or fixed installations where maintenance access is easy
<b>DOWNTIME RISK</b>	Lower because alignment integrity reduces coupling and bearing wear, extending the service life	Higher because misalignment can cause premature coupling, bearing, and other component failure

### ALIGNMENT-FREE BELT DRIVE BENEFITS:

- Eliminates catastrophic immediate failure of input if not aligned properly
- Eliminates rapid wear of components if output is not aligned properly
- Most energy efficient of all drive types — none wasted in transmission
- Reduces need for spare component inventory by using common components
- Bolt together construction allows for ease of installation
- Pairing with a VFD starter increases longevity



*CAD drawing of an alignment-free drive in an underground conveyor system*